

CASE

NUMBER:

99 - 292

Index for Case: 1999-00292

AS OF : 02/19/02

Jessamine County Water District #1

Construct, Finance, Rates; 278.023

Regular

1,000,000 GALLON STORAGE TANK

IN THE MATTER OF THE APPLICATION OF JESSAMINE COUNTY WATER DISTRICT NO. 1, A WATER DISTRICT ORGANIZED PURSUANT TO CHAPTER 74 OF THE KENTUCKY REVISED STATUTES, IN JESSAMINE COUNTY, KENTUCKY, FOR (1) A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, AUTHORIZING AND PERMITTING SAID WATER DISTRICT TO CONSTRUCT WATER WORKS DISTRIBUTION SYSTEM IMPROVEMENTS, CONSISTING OF A ONE MILLION GALLONE ELEVATED WATER TANK AND ACCOMPANYING BOOSTER PUMP STATION AND RADIO TELEMTRY SYSTEM AND APPURTENANCES, (2) AN INCREA IN CUSTOMER WATER RATES AND (3) APPROVAL OF THE PROPOSED PLAN OF FINANCING OF SAID PROJECT

| SEQ NBR | Date | Remarks |
|------------|--------------|--|
| 1 | 07/02/99 | Application. |
| 2 | 07/08/99 | Acknowledgement letter. |
| 3 | 07/19/99 | No deficiencies letter |
| 4 | 07/30/99 | Final Order approving construction, financing and rates. |
| 5 | 10/18/00 | First reminder letter to Eleanor Blakeman requesting copies of "as-built" drawings and a certified statement of completed construction. |
| 6 | (M) 10/20/00 | Eleanor M Blakeman - Jessamine County Water District #1 - FAX - Notice that subject project is still under construction with a target date of 90 days to complete. |
| 7 | (M) 02/15/02 | Record drawings copy of certification Letter |

OS - 2
(10/84)

KENTUCKY PUBLIC SERVICE COMMISSION

MAIN CASE FILE NOTES

2-15-2002

Case No. 1999-292

Copy of as-built plans
in ~~the~~ map file

Rebekah Meador



3 HMB Circle
U.S. 460
Frankfort, KY 40601
502-695-9800

RECEIVED

FEB 15 2002

LETTER OF TRANSMITTAL

KENTUCKY ■ TENNESSEE ■ INDIANA ■ ALABAMA ■ WEST VIRGINIA ■ GEORGIA

PUBLIC SERVICE
COMMISSION

TO PSC
PO Box 615 211 SOWER BLVD.
FRANKFORT, KY 40602

| | | | |
|-----------|-----------------------------|---------|-----|
| DATE | 2/11/02 | JOB NO. | 430 |
| ATTENTION | MR. JAMES RICE | | |
| RE: | CASE No. 1999-292 | | |
| | SCWD #1 - 1 Mb TANK PROJECT | | |
| | | | |
| | | | |
| | | | |
| | | | |

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change order RECORD DRAWINGS

| COPIES | DATE | NO. | DESCRIPTION |
|--------|------|-----|-------------------------------|
| 1 | | | RECORD DRAWINGS |
| 1 | | | COPY OF CERTIFICATION LETTER. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comment _____
 FOR BIDS DUE _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS

CALL WITH ANY QUESTIONS.

CHRIS A. STEWART, EIT
PROJECT MANAGER

Mr. CARL WAITS - SCWD #1

COPY TO MR. MIKE WILMOTH, PE - HMB
FILE

SIGNED:



PROFESSIONAL ENGINEERS, INC

3 HMB Circle

U.S. 460

Frankfort, KY 40601

Office: (502) 695-9800

Fax: (502) 695-9810

November 9, 2001

Mr. Carl Waits, Chairman
Jessamine County Water District No. 1
200 West Maple Street
Nicholasville, KY 40356

RE: 1 MG Tank Project
DW #0570214-98-001
HMB Project No. 430.15

Dear Mr. Waits:

This correspondence is to inform you that the above referenced project has, in our opinion, been completed in accordance with the approved plans and specifications.

If you have any questions regarding this matter please call our office at (502)695-9800. Thank you.

Sincerely,

HMB Professional Engineers, Inc.

Bob Blankenship
Bob Blankenship, PE
Vice President

cc: Mr. Gene Floyd - Rural Development
Mr. Scott Thomson, PE - DOW
Mr. Chris Stewart, EIT - HMB
Mr. Mike Wilmoth, PE - HMB
File

Highway Engineering

Structural Engineering

Water & Wastewater

Site Development

Master Planning

Environmental Planning

Surveying

Project Management

Cost Estimation

Construction Inspection

Aviation Services

Environmental Remediation

Landscape Architecture

ENGINEERS • ARCHITECTS • PLANNERS

Bob Blankenship, P.E.

Vice President

3 HMB Circle

Frankfort, KY 40601

(502) 695-9800 • FAX: (502) 695-9810



Haworth, Meyer & Boleyn Inc.

Nashville, TN
(615) 834-4335

Montgomery, AL
(334) 277-1002

Charleston, WV
(304) 744-5200

New Albany, IN
(812) 944-9672



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KENTUCKY 40602-0615
www.psc.state.ky.us
(502) 564-3940
Fax (502) 564-3960

Paul E. Patton, Governor
Ronald B. McCloud, Secretary
Public Protection and
Regulation Cabinet
Thomas M. Dorman
Executive Director
Public Service Commission

RECEIVED
OCT 20 2000
PUBLIC SERVICE
COMMISSION
Martin J. Huelshorn
Chairman
Edward J. Holmes
Vice Chairman
Gary W. Gillis
Commissioner

October 18, 2000

CASE # 1999-292
10/19/00

Ms. Eleanor Blakeman
Office Manager
Jessamine County Water District #1
200 West Maple Street
Nicholasville, Kentucky 40356

To: JESS HELTON
@ PSC
FROM: BOB BLANKENSHIP
@ HMB ENGRS.

Re: Case No. 1999-292, First Reminder Letter

SUBJECT PROJECT IS
STILL UNDER CONSTRUCTION.
Bob Blankenship, PE
cc JCWO1

Dear Ms. Blakeman:

The Commission entered the enclosed Final Order in this case on July 30, 1999. The Commission ordered that Jessamine District No. 1 shall file a copy of the "as-built" drawings and a certified statement that the construction has been satisfactorily completed in accordance with the plans and specifications within 60 days of the substantial completion of the construction. To date the Commission has not received this filing. Please make the filing, referencing the case number 1999-292, not later than 15 days from the date of this letter.

If you have questions concerning this letter, please contact Jess Helton, of the Filings Division, at 502-564-3940, extension 278. Otherwise, please mail the required filing to Thomas M. Dorman, Executive Director, Public Service Commission, 211 Sower Blvd., Post Office Box 615, Frankfort, Kentucky 40602.

Sincerely,

Stephanie Bell

Stephanie Bell
Secretary of the Commission

TARGETING 90 DAYS
TO COMPLETE.

Enclosure
CC: Parties of Record





Paul E. Patton, Governor
Ronald B. McCloud, Secretary
Public Protection and
Regulation Cabinet

Thomas M. Dorman
Executive Director
Public Service Commission

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
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(502) 564-3940
Fax (502) 564-3460

Martin J. Huelsmann
Chairman

Edward J. Holmes
Vice Chairman

Gary W. Gillis
Commissioner

October 18, 2000

Ms. Eleanor Blakeman
Office Manager
Jessamine County Water District #1
200 West Maple Street
Nicholasville, Kentucky 40356

Re: Case No. 1999-292, First Reminder Letter

Dear Ms. Blakeman:

The Commission entered the enclosed Final Order in this case on July 30, 1999. The Commission ordered that Jessamine District No. 1 shall file a copy of the "as-built" drawings and a certified statement that the construction has been satisfactorily completed in accordance with the plans and specifications within 60 days of the substantial completion of the construction. To date the Commission has not received this filing. Please make the filing, referencing the case number 1999-292, not later than 15 days from the date of this letter.

If you have questions concerning this letter, please contact Jess Helton, of the Filings Division, at 502-564-3940, extension 278. Otherwise, please mail the required filing to Thomas M. Dorman, Executive Director, Public Service Commission, 211 Sower Blvd., Post Office Box 615, Frankfort, Kentucky 40602.

Sincerely,

A handwritten signature in black ink that reads "Stephanie Bell".

Stephanie Bell
Secretary of the Commission

Enclosure
CC: Parties of Record



INDEX FOR CASE: 99-292
JESSAMINE COUNTY WATER DISTRICT #1
Construct, Finance, Rates; 278.023
1,000,000 GALLON STORAGE TANK

IN THE MATTER OF THE APPLICATION OF JESSAMINE COUNTY WATER DISTRICT NO. 1, A WATER DISTRICT ORGANIZED PURSUANT TO CHAPTER 74 OF THE KENTUCKY REVISED STATUTES, IN JESSAMINE COUNTY, KENTUCKY, FOR (1) A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY, AUTHORIZING AND PERMITTING SAID WATER DISTRICT TO CONSTRUCT WATER WORKS DISTRIBUTION SYSTEM IMPROVEMENTS, CONSISTING OF A ONE MILLION GALLONE ELEVATED WATER TANK AND ACCOMPANYING BOOSTER PUMP STATION AND RADIO TELEMETRY SYSTEM AND APPURTENANCES, (2) AN INCREASE IN CUSTOMER WATER RATES AND (3) APPROVAL OF THE PROPOSED PLAN OF FINANCING OF SAID PROJECT

| SEQ NBR | ENTRY DATE | REMARKS |
|------------|---------------|--|
| 0001 | 07/02/99 | Application. |
| 0002 | 07/08/99 | Acknowledgement letter. |
| 0003 | 07/19/99 | No deficiencies letter |
| 0004 | 07/30/99 | Final Order approving construction, financing and rates. |



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

CERTIFICATE OF SERVICE

RE: Case No. 99-292
JESSAMINE COUNTY WATER DISTRICT #1

I, Stephanie Bell, Secretary of the Public Service Commission, hereby certify that the enclosed attested copy of the Commission's Order in the above case was served upon the following by U.S. Mail on July 30, 1999.

Parties of Record:

Eleanor M. Blakeman
Office Manager
Jessamine County Water District #1
200 West Maple Street
Nicholasville, KY. 40356

Bob Blankenship
Haworth, Meyer & Boleyn, Inc.
3 HMB Circle
U.S. 460
Frankfort, KY. 40601

Stephan Bell
Secretary of the Commission

SB/hv
Enclosure

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF JESSAMINE COUNTY)
WATER DISTRICT NO. 1, A WATER DISTRICT)
ORGANIZED PURSUANT TO CHAPTER 74 OF THE)
KENTUCKY REVISED STATUTES, IN JESSAMINE)
COUNTY, KENTUCKY, FOR (1) A CERTIFICATE OF)
PUBLIC CONVENIENCE AND NECESSITY,)
AUTHORIZING AND PERMITTING SAID WATER)
DISTRICT TO CONSTRUCT WATER WORKS)
DISTRIBUTION SYSTEM IMPROVEMENTS,) CASE NO. 99-292
CONSISTING OF A ONE MILLION GALLON)
ELEVATED WATER TANK AND ACCOMPANYING)
BOOSTER PUMP STATION AND RADIO)
TELEMETRY SYSTEM AND APPURTENANCES, (2))
AN INCREASE IN CUSTOMER WATER RATES)
AND (3) APPROVAL OF THE PROPOSED PLAN OF)
FINANCING OF SAID PROJECT)

O R D E R

On July 2, 1999, Jessamine County Water District No. 1 ("Jessamine District No. 1") submitted an application for a Certificate of Public Convenience and Necessity to construct a \$1,492,000 waterworks improvement project, for approval of its plan of financing for this project, and for adjustments to its water service rates. This project consists of the construction of a 1,000,000 gallon elevated water storage tank, 350 gallon per minute booster pump station, and related appurtenances. Project funding is a \$1,492,000 bond issue to be purchased pursuant to an agreement with the U. S. Department of Agriculture's Rural Development ("RD").

Jessamine District No. 1's application was made pursuant to KRS 278.023, which requires the Commission to accept agreements between water utilities and the U. S. Department of Agriculture or the U. S. Department of Housing and Urban Development and to issue the necessary orders to implement the terms of such agreements within 30 days of satisfactory completion of the minimum filing requirements. Given that minimum filing requirements were met in this case on July 2, 1999, KRS 278.023 does not grant the Commission any discretionary authority to modify or reject any portion of this agreement.

IT IS THEREFORE ORDERED that:

1. Jessamine District No. 1 is hereby granted a Certificate of Public Convenience and Necessity for the proposed construction project.
2. Jessamine District No. 1's proposed plan of financing with RD is accepted.
3. Jessamine District No. 1 is authorized to issue bonds not to exceed \$1,492,000.
4. Jessamine District No. 1 shall file a copy of the "as-built" drawings and a certified statement that the construction has been satisfactorily completed in accordance with the contract plans and specifications within 60 days of the substantial completion of the construction certificated herein.
5. The rates set out in Appendix A, which is attached hereto and incorporated herein, are the rates approved for service rendered on and after the date of this Order.
6. Jessamine District No. 1 shall submit its revised tariff setting out the rates in Appendix A within 30 days of the date of this Order.

7. Three years from the effective date of this Order Jessamine District No. 1 shall file an income statement, along with any pro forma adjustments, in sufficient detail to demonstrate that the rates approved herein are sufficient to meet its operating expenses and annual debt service requirements.

Nothing contained herein shall be deemed a warranty of the Commonwealth of Kentucky, or any agency thereof, of the financing herein accepted.

Done at Frankfort, Kentucky, this 30th day of July, 1999.

By the Commission

ATTEST:


Executive Director

APPENDIX A

APPENDIX TO AN ORDER OF THE KENTUCKY PUBLIC SERVICE COMMISSION IN CASE NO. 99-292 DATED JULY 30, 1999

The following rates and charges are prescribed for the customers in the area served by Jessamine County Water District #1. All other rates and charges not specifically mentioned herein shall remain the same as those in effect under authority of the Commission prior to the effective date of this Order.

Monthly Water Rates

| | | | |
|-------|----------------|---------|-------------------|
| First | 3,000 gallons | \$18.00 | Minimum bill |
| Next | 7,000 gallons | 4.20 | per 1,000 gallons |
| Over | 10,000 gallons | 4.10 | per 1,000 gallons |



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

July 19, 1999

Eleanor M. Blakeman
Office Manager
Jessamine County Water District #1
200 West Maple Street
Nicholasville, KY. 40356

Bob Blankenship
Haworth, Meyer & Boleyn, Inc.
3 HMB Circle
U.S. 460
Frankfort, KY. 40601

RE: Case No. 99-292
JESSAMINE COUNTY WATER DISTRICT #1

The Commission staff has reviewed your application in the above case and finds that it meets the minimum filing requirements. Enclosed please find a stamped filed copy of the first page of your filing. This case has been docketed and will be processed as expeditiously as possible.

If you need further assistance, please contact my staff at 502/564-3940.

Sincerely,

A handwritten signature in cursive script that reads "Stephanie Bell".

Stephanie Bell
Secretary of the Commission

SB/hv
Enclosure

James L. Haworth, P.E. - Retired
Fred A. Meyer, P.E., L.A.
Philip Boleyn, P.E., L.A.
Bob Blankenship, P.E.

Haworth, Meyer & Boleyn, Inc.

James H. Smith, P.E., L.S.
Bradley M. Meyer, P.E., L.S.
Joseph C. Pyles, P.E.
Karen Wood



ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
U.S. 460
Frankfort, KY 40601

Office: (502) 695-9800
Fax: (502) 695-9810

June 28, 1999

Helen Helton, Executive Director
Public Service Commission
730 Schenkel lane
Frankfort, KY 40602

FILED

JUL 02 1999

PUBLIC SERVICE
COMMISSION

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

CASE 99-292

Re: Request for Certificate of Convenience & Necessity
Jessamine County Water District #1
Contract IV-1,000,000 Gallon Elevated Water
Storage Tank & Pump Station
Jessamine County, Kentucky
HMB Project No: 430.00

Dear Ms. Helton:

On behalf of the Jessamine County Water District #1 (JCWD), we are requesting that a case file be opened and the process commence for issuance of a Certificate of Convenience and Necessity. The JCWD successfully bid this water project on April 27, 1999. Construction is expected to begin in July 1999 and be completed in March 2000.

The Attorney on this project is:

Mr. Henry Reed III
Attorney at Law
2218 Frankfort Avenue
Louisville, KY 40206

We are attaching to this letter ten (10) copies each (unless otherwise noted) of the following items. It is our understanding that these are all of the items required by you. Attached please find:

- PSC Application with Attachments.
- Rural Development Letter of Conditions.
- Preliminary Engineering Report Signed & Sealed.
- DOW's Approval of Plans & Specifications.
- Final Engineering Report Signed & Sealed (with Bid Tab).
- Rural Development's Concurrence Letter of Award
- Two Sets of Plans & Specification.

442 Metroplex
Suite 105
Nashville, TN 37211
(615) 834-4335

624 West Main Street
Louisville, KY 40202
(502) 587-0875

2500 Fairlane Drive
Building 1, Suite 170
Montgomery, AL 36116
(334) 277-1002

325 Sixth Avenue
South Charleston, WV 25303
(304) 744-5200

1410 Charlestown-New Albany Pike
Suite 201
Jeffersonville, IN 47130
(812) 288-8861



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

July 8, 1999

Eleanor M. Blakeman
Office Manager
Jessamine County Water District #1
200 West Maple Street
Nicholasville, KY. 40356

Bob Blankenship
Haworth, Meyer & Boleyn, Inc.
3 HMB Circle
U.S. 460
Frankfort, KY. 40601

RE: Case No. 99-292
JESSAMINE COUNTY WATER DISTRICT #1
(Construct, Finance, Rates; 278.023) 1,000,000 GALLON STORAGE TANK

This letter is to acknowledge receipt of initial application in the above case. The application was date-stamped received July 2, 1999 and has been assigned Case No. 99-292. In all future correspondence or filings in connection with this case, please reference the above case number.

If you need further assistance, please contact my staff at 502/564-3940.

Sincerely,

A handwritten signature in cursive script that reads "Stephanie Bell".

Stephanie Bell
Secretary of the Commission

SB/jc

James L. Haworth, P.E. - Retired
Fred A. Meyer, P.E., L.A.
Philip Boleyn, P.E., L.A.
Bob Blankenship, P.E.



Haworth, Meyer & Boleyn, Inc.

James H. Smith, P.E., L.S.
Bradley M. Meyer, P.E., L.S.
Joseph C. Pyles, P.E.
Karen Wood

ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
U.S. 460
Frankfort, KY 40601

Office: (502) 695-9800
Fax: (502) 695-9810

June 28, 1999

Helen Helton, Executive Director
Public Service Commission
730 Schenkel lane
Frankfort, KY 40602

FILED

JUL 02 1999

PUBLIC SERVICE
COMMISSION

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

CASE 99-292

Re: Request for Certificate of Convenience & Necessity
Jessamine County Water District #1
Contract IV-1,000,000 Gallon Elevated Water
Storage Tank & Pump Station
Jessamine County, Kentucky
HMB Project No: 430.00

Dear Ms. Helton:

On behalf of the Jessamine County Water District #1 (JCWD), we are requesting that a case file be opened and the process commence for issuance of a Certificate of Convenience and Necessity. The JCWD successfully bid this water project on April 27, 1999. Construction is expected to begin in July 1999 and be completed in March 2000.

The Attorney on this project is:

Mr. Henry Reed III
Attorney at Law
2218 Frankfort Avenue
Louisville, KY 40206

We are attaching to this letter ten (10) copies each (unless otherwise noted) of the following items. It is our understanding that these are all of the items required by you. Attached please find:

- PSC Application with Attachments.
- Rural Development Letter of Conditions.
- Preliminary Engineering Report Signed & Sealed.
- DOW's Approval of Plans & Specifications.
- Final Engineering Report Signed & Sealed (with Bid Tab).
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- Two Sets of Plans & Specification.

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Building 1, Suite 170
Montgomery, AL 36116
(334) 277-1002

325 Sixth Avenue
South Charleston, WV 25303
(304) 744-5200

1410 Charlestown-New Albany Pike
Suite 201
Jeffersonville, IN 47130
(812) 288-8961



Ms. Helen Helton
June 28, 1999
Page Two

If additional information is required, please contact our office or the Attorney.

Sincerely,

HAWORTH, MEYER & BOLEYN, INC.

Bob Blankenship ^(DW)

Bob Blankenship, P.E.

cc: Gene Floyd, R.D.
Henry Reed, III, Attorney
John Martin, HMB

water\430\Helton.ltr

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

REED LAW OFFICE

HENRY M. REED III
2218 FRANKFORT AVENUE
LOUISVILLE, KENTUCKY 40206-2408

(502) 899-3880
FAX (502) 899-3882
E-MAIL: hankreed@aol.com

July 1, 1999

Hand Delivered by Haworth, Meyer & Boleyn, Inc.

Ms. Helen C. Helton
Executive Director of the
Public Service Commission
730 Schenkel Lane
P.O. Box 615
Frankfort, Kentucky 40602

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

In re: Jessamine County Water District No. 1

Petition for Approval of Construction Project and Issuance of \$1,492,000 Jessamine County Water District No. 1 Water Revenue Bonds, Series of 1999 to be Sold to the United States of America, Acting Through the U.S. Department of Agriculture, Rural Development ("USDARD")

Ms. Helton:

Enclosed herewith please find ten (10) copies of the Petition of the District in connection with the above matter attached to which are the following:

1. Legal Notice Regarding District's Intention to file with the Public Service Commission which was published in The Jessamine Journal on July 1, 1999.
2. Letter of Conditions to District from United States Department of Agriculture, Rural Development ("USDARD") dated November 25, 1997 as amended by Letter dated June 11, 1999. (Debt Service Schedule Attached).
3. Certification of District Chairman Regarding Compliance with Public Service Commission Requirements.
4. Ordinance of the Board of Commissioners of the District amending rates and charges for Water Service in accordance with USDARD Letter of Conditions.
5. Concurrence of USDARD in Award of Bids.

Ms. Helen C. Helton

July 1, 1999

Page-2-

All required engineering information will be submitted with the enclosed Petition by Haworth, Meyer & Boleyn, Inc. The acceptance period for construction bids is scheduled to expire on July 28, 1999 and the District would sincerely appreciate the entry of the Commission's Order as soon as its schedule permits.

If any additional information is required, please don't hesitate to contact the undersigned.

Sincerely yours,



Henry M. Reed III

HMR:mlh
Enclosures

cc: Mr. Carl Waits
Chairman
Jessamine County Water District No. 1
200 W. Maple Street
Nicholasville, Kentucky 40356

Mrs. Eleanor Blakeman
Manager
Jessamine County Water District No. 1
200 W. Maple Street
Nicholasville, Kentucky 40356

Mr. W. Gene Floyd
District Loan Specialist
U.S. Department of Agriculture
Rural Development
P.O. Box 1227
Shelbyville, Kentucky 40066-3277

Mr. Bob Blankenship
Haworth, Meyer & Boleyn, Inc.
3HMB Circle, U.S. 460
Frankfort, Kentucky 40601

Martin D. East, Esquire
Attorney at Law
103 S. First Street
Nicholasville, Kentucky 40356

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

**IN THE MATTER OF THE APPLICATION OF THE
JESSAMINE COUNTY WATER DISTRICT NO. 1**

BOARD OF WATER COMMISSIONERS

Carl Waits, Chairman

Claude Lawson

Mrs. Eddie Cox

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION
IN THE MATTER OF THE APPLICATION OF
JESSAMINE COUNTY WATER DISTRICT NO. 1

1. Petition of Jessamine County Water District No. 1 ("District") for Certificate of Public Convenience and Necessity.
2. Legal Notice Regarding District's Intention to file with the Public Service Commission, as published in The Jessamine Journal on July 1, 1999.
3. Letter of Conditions to District from United States Department of Agriculture, Rural Development ("USDARD") dated November 25, 1997, as amended by letter of June 11, 1999.
4. Certification of District Chairman Regarding Compliance with Public Service Commission Requirements.
5. Ordinance of the Board of Commissioners of the District amending rates and charges for Water Service in accordance with USDARD Letter of Conditions.
6. Concurrence of USDARD in Award of Bids.

All engineering data will be submitted directly by Haworth, Meyer & Boleyn, Inc., directly to the Commission.

BEFORE THE PUBLIC SERVICE COMMISSION OF KENTUCKY

IN THE MATTER OF THE APPLICATION OF THE JESSAMINE)
COUNTY WATER DISTRICT NO. 1, A WATER DISTRICT)
ORGANIZED PURSUANT TO CHAPTER 74 OF THE)
KENTUCKY REVISED STATUTES, IN JESSAMINE COUNTY,)
KENTUCKY, FOR (1) A CERTIFICATE OF PUBLIC)
CONVENIENCE AND NECESSITY, AUTHORIZING AND)
PERMITTING SAID WATER DISTRICT TO CONSTRUCT)
WATERWORKS DISTRIBUTION SYSTEM IMPROVEMENTS,)
CONSISTING OF A ONE MILLION GALLON ELEVATED)
WATER TANK AND ACCOMPANYING BOOSTER PUMP)
STATION AND RADIO TELEMETRY SYSTEM AND)
APPURTENANCES, (2) AN INCREASE IN CUSTOMER WATER)
RATES AND (3) APPROVAL OF THE PROPOSED PLAN OF)
FINANCING OF SAID PROJECT.)

PETITION

CASE 99-292

Pursuant to KRS 278.023, the Petitioner, the Jessamine County Water District No. 1 of Jessamine County, Kentucky, respectfully states:

1. That Petitioner is a Water District of Jessamine County, created and existing under and by virtue of Chapter 74 of the Kentucky Revised Statutes, pursuant to an Order of the County Court of said County, following the requisite procedure prescribed in said Chapter 74.
2. That the Post Office address of said District is "Jessamine County Water District No. 1, c/o Carl Waits, Chairman, Jessamine County Water District No. 1, 200 W. Maple Street, Nicholasville, Kentucky 40356".
3. That the formation of the District, its present tariff of rates and the issuance of its outstanding Waterworks System Revenue Bonds, Series of 1966, dated July 1, 1966 and Water Revenue Bonds, Series A and B of 1986, dated June 4, 1987 have been previously approved by Orders of the Public Service Commission of Kentucky.
4. That the Petitioner seeks (1) a Certificate of Public Convenience and Necessity permitting said District to construct a one million gallon elevated water tank and accompanying booster pump station and radio telemetry system, and (2) approval of the proposed plan of financing said Project through the issuance of approximately \$1,492,000 of the District's Water Revenue Bonds, Series of 1999 and (3) approval of increased water rates proposed to be charged by the District to its customers.

5. That Petitioner proposes to finance the construction of said Project through the issuance of \$1,194,000 of its Water Revenue Bonds, Series of 1998 (the "Bonds"). The District has a tentative commitment from United States Department of Agriculture, Rural Development ("USDARD"), to purchase its Bonds at an interest rate not to exceed 5.375% per annum, provided proposals are not received from others on a basis which USDARD considers reasonable.

6. That the Petitioner does propose to amend and increase its existing water rates and charges for existing services.

| <u>Usage</u> | <u>Proposed Charges</u> | <u>Existing Charges</u> (Effective 5/15/95) |
|-------------------------|-------------------------|--|
| First 3,000 gallons | \$18.00 Minimum Bill | \$15.33 Minimum Bill |
| Next 7,000 gallons | 4.20 per 1,000 gallons | 3.16 per 1,000 gallons |
| All Over 10,000 gallons | 4.10 per 1,000 gallons | 2.86 per 1,000 gallons |

7. That the Petitioner has observed the appropriate legal procedure in employing Haworth, Meyer & Boleyn, Inc., Frankfort, Kentucky to prepare the plans and specifications for the construction of the proposed Project. The plans and specifications as to said Project have been approved by the appropriate governmental agencies and by USDARD.

8. That the approval of the Public Service Commission is urgently required in order to enable the District to proceed to accept construction bids for the Project and proceed with the construction in order to provide for the needs of the District.

9. That there are attached to this Petition those Exhibits indicated in the Exhibit Addendum to this Petition which the Petitioner believes the Commission will find necessary in ruling on the requests set forth in this Petition pursuant to KRS 278.023.

WHEREFORE, Petitioner Prays that the Public Service Commission of Kentucky grant to the Petitioner the following:

- A. A Certificate of Public Convenience and Necessity, permitting the Petitioner District to construct the Project as described in the Engineers Report filed herewith as an Exhibit.
- B. An Order approving the financing arrangements made by the District, via., the issuance of \$1,194,000 of Water Revenue Bonds, at an interest rate of not exceeding 5.375% per annum.

C. An Order approving the District's proposed water rates.

Dated at Nicholasville, Kentucky as of this 29th day of June, 1999.

JESSAMINE COUNTY WATER DISTRICT NO. 1

By Carl E. Waits
Chairman, Board of Water Commissioners



Henry M. Reed III, Bond Counsel
2218 Frankfort Avenue
Louisville, Kentucky 40206



Martin D. East, Esquire
Counsel for Petitioner
103 S. First Street
Nicholasville, Kentucky 40356

STATE OF KENTUCKY)
)
COUNTY OF JESSAMINE)

The undersigned, Carl Waits, being first duly sworn, deposes and states: That he is the Chairman of the Board of Water Commissioners of the Jessamine County Water District No. 1 of Jessamine County, Kentucky, Petitioner in the above Petition; that he has read the foregoing Petition and has noted the contents thereof; that the same is true of his own knowledge, except as to matters which are therein states on information or belief, and that as to those matters, he believes same to be true.

IN TESTIMONY WHEREOF, witness the signature of the undersigned on the 28 day of June, 1999.

Carl E. Waits
Carl Waits

Acknowledged before me by Carl Waits, Chairman of the Board of Water Commissioners of the Jessamine County Water District No. 1, on this 28th day of June, 1999.

My Commission expires 4/28/03.

Eleanor M. Blakeman
Notary Public, State at Large
Kentucky

(Seal of Notary)

AFFIDAVIT OF PUBLICATION

I hereby certify that I am the GRAPHIC DESIGN SUPRV. of

THE JESSAMINE JOURNAL

the newspaper published in the County of Jessamine, Kentucky (hereinafter referred to as the "publication area") which has the largest bona fide circulation in said publication area of any newspaper published therein.

I further certify that there is attached hereto a true copy of

LEGAL NOTICE

which was published in said newspaper in its regular issue for the 1ST day of July, 1999.

I further certify that said newspaper maintains its principal office in the publication area for the purpose of gathering news and soliciting advertisements and other general business of newspaper publication and has a second-class mailing permit issued for that office. I further certify that said newspaper is published regularly as frequently as once a week for at least fifty weeks during the calendar year as prescribed by its mailing permit, and it has been so published in the publication area for the immediately preceding two-year period prior to the date of publication hereinbefore referred to.

I further certify that said newspaper is circulated generally in the publication area, maintains a definite price or consideration not less than fifty percent of its publication price and is paid for by not less than fifty percent of those to whom distribution is made. I further certify that said newspaper bears a title or name, consists of not less than four pages without a cover, is of a type to which the general public resorts for passing events of a political, religious, commercial and social nature for current happenings, announcements, miscellaneous reading matter, advertisements and other notices and that the news content of said newspaper is at least twenty-five percent of the total column space in more than one-half of the issues during any 12-month period.

I further certify that all of the foregoing facts were true on the date of the publication hereinbefore referred to.

Dated this 2 day of JULY, 1999.

Linda S. Wiley

Acknowledged before me this 2 day of July, 1999.

My commission expires January 21, 2003

Maabrooklin Sapp Eldridge
Notary Public, Jessamine Co., Kentucky

(Seal of Notary)

The Jessamine Journal

July 1, 1999

LEGALS, NOTICES

JANITORIAL BIDS

City of Nicholasville is now accepting Janitorial Services for the Police Station. Bid specifications may be picked up at the City Office Building, Room 101, 517 N. Main Street. Bids received by Friday, July 30, 1999 at 10:00 A.M. E.O.E.

NOTICE OF SALE

nonpayment of rent, the contents of Unit H, belonging to JOHN W. HARRISON, 126 Allison, Nicholasville, will be sold Friday, July 9, 1999 at 10:00 A.M. Sealed bids only. Location: 126 Allison Court, Nicholasville, Ky.

COMMONWEALTH OF KENTUCKY TRANSPORTATION CABINET DEPARTMENT OF HIGHWAYS BIDDING TO CONTRACTORS

Bids will be received by the Department in the Division of Contract Administration and the Auditorium located on the 3rd floor of the State Office Building, Frankfort, Kentucky, until 10:00 A.M. EASTERN TIME on the 23rd day of JULY. Bidding time bids will be publicly opened at the improvement of: US ROUTE 127, ST. PR. NH 3000, 121 SW 99: Raised pavement marker on various routes in Adair, Bourbon, Boyle, Breathitt, Clay, Clinton, etc. Greenup, Jackson, Jessamine, Lewis, Lincoln, Madison, Magoffin, Mercer, Montgomery, Morgan, Pike, Powell, Rockcastle, Rowan, Wayne, Whitley, Woodford, and Wolfe

Department of Highways hereby notifies that it will affirmatively insure contract entered into pursuant to this act. Disadvantaged Business Enterprises are afforded full opportunity to submit response to this invitation, and will be eliminated against on the ground of race or national origin in consideration for

Proposals for all projects will be available at 10:00 A.M. EASTERN DAYLIGHT TIME, JULY 23, 1999, at the District Procurement. Bid proposals for will be available at a cost of \$10 each (non-refundable). Bid proposals must be accompanied by request for proposal fee (NON-REFUNDABLE). BID PROPOSALS TO BE OPENED ONLY TO PRE-QUALIFIED BIDDERS.

Proposals for all projects will be available at 10:00 A.M. EASTERN DAYLIGHT TIME, JULY 23, 1999, at the District Procurement. Bid proposals for will be available at a cost of \$10 each (non-refundable). Bid proposals must be accompanied by request for proposal fee (NON-REFUNDABLE). BID PROPOSALS TO BE OPENED ONLY TO PRE-QUALIFIED BIDDERS.

Request for Bids

Jessamine County Board of Education will receive bids for Small Wares (all schools). Bids will be received until 10:00 A.M. Thursday, July 15, 1999 at the Board of Education Central Office, 501 East Maple St., Nicholasville, KY 40356. Inquiries about bids may be directed to the Superintendent, Director of Food Service, (606) 885-4179, Ext. 118.

NOTICE OF ENACTMENT OF ORDINANCE

Notice is hereby given that the Nicholasville City Commission on June 24, 1999 enacted an ordinance, the full text of which is available for inspection in the office of the City Clerk, 601 N. Main, Nicholasville, Ky. The ordinance by title: ORDINANCE 298-99, AN ORDINANCE ADOPTING THE CITY OF NICHOLASVILLE, KENTUCKY ANNUAL BUDGET FOR THE FISCAL YEAR 7-1-99 THROUGH 6-30-00 BY ESTIMATING REVENUES AND RESOURCES AND APPROPRIATING FUNDS FOR THE OPERATION OF GENERAL GOVERNMENT.

Bonnie Dean
City Clerk
Published 7/1/99

NOTICE OF ENACTMENT OF ORDINANCE

Notice is hereby given that the Nicholasville City Commission on June 24, 1999 enacted an ordinance, the full text of which is available for inspection in the office of the City Clerk, 601 N. Main, Nicholasville, Ky. The ordinance by title: ORDINANCE 299-99, AN ORDINANCE ADOPTING THE CITY OF NICHOLASVILLE, KENTUCKY ANNUAL BUDGET FOR THE UTILITY GOVERNMENT FOR THE FISCAL YEAR 7-1-99 THROUGH 6-30-00 BY ESTIMATING REVENUES AND RESOURCES AND APPROPRIATING FUNDS FOR THE OPERATION OF UTILITIES.

Bonnie Dean
City Clerk
Published 7/1/99

PUBLIC NOTICE

The Jessamine County-City of Wilmore Joint Board of Adjustment will meet Thursday, July 15, 1999 at 7:00 p.m. in the Jessamine County Courthouse.

The agenda will be as follows:

1. An Application for Conditional Use Permit, Section 3.2332, Home occupation for small business, audio engineer-mixing audio on a computer and using address to receive letters and payments for live sound, submitted by Christopher G. Naughton for property located at 408 Epworth Avenue, Wilmore.
2. An Application for Variance, Section 3.224, Variance from required 175 ft. road frontage to 50 ft. access easement, submitted by David A. and Deborah Stinnert for property located on Logana Road.
3. An Application for Variance, Section 3.224, Side yard setback from 25 ft. to 3 ft. for storage building, submitted by Charles and Betty Gettings for property located at 6161 Haroldsburg Road.
4. Other Business.

Betty L. Taylor
Administrative Officer

PUBLIC NOTICE

The Jessamine County-City of Wilmore Joint Planning Commission will meet in regular session, Tuesday, July 13, 1999 at 7:00 p.m. in the Jessamine County Courthouse.

The agenda will be as follows:

1. Pre-Application meeting for proposed Zone Map Amendment from A-1 to P-1 for 4.899 acres in order to construct a multi-purpose family life center, requested by Lonnie Moore, Pastor, Tabernacle Baptist Church for property located on Vince Road.
2. Pre-Application meeting for a Major Subdivision for 30.52 acres to be divided into twenty five (25) lots, Crosswoods Subdivision, Unit 3, requested by Turfand Development Corporation for property located between

LEGAL NOTICE REGARDING THE JESSAMINE COUNTY WATER DISTRICT NO. 1

On or about July 1, 1999, the Jessamine County Water District No. 1 ("District") will file a Petition with the Public Service Commission of Kentucky requesting the Commission to take the following action:

- (1) The issuance of a Certificate of Public Convenience and Necessity for the construction by the District of improvements and extensions to the Jessamine County Water Distribution System consisting of the construction and installation of a one million gallon elevated water tank and accompanying booster pump station (the "Project").
- (2) The approval of the issuance of approximately \$1,492,000 of the District's Water Revenue Bonds (the "Bonds") to be purchased by United States of America, acting through the U.S. Department of Agriculture, Rural Development ("USDARD").
- (3) The approval by PSC of rates and charges for the services provided by the District's water distribution system as follows:

| Usage | Proposed Charges | Existing Charges (Effective 5/15/95) |
|-------------------------|------------------------|--------------------------------------|
| First 3,000 gallons | \$18.00 Minimum Bill | \$15.33 Minimum Bill |
| Next 7,000 gallons | 4.20 per 1,000 gallons | 3.16 per 1,000 gallons |
| All over 10,000 gallons | 4.10 per 1,000 gallons | 2.86 per 1,000 gallons |

The Petition will be filed pursuant to the provisions of KRS 278.023 and it is anticipated that an Order will be entered by the Public Service Commission approximately 30 days after the actual filing of the Petition.

JESSAMINE COUNTY WATER DISTRICT NO. 1
s/ Carl Waits, Chairman

NOTICE

Notice is hereby given that Delta Natural Gas Company, Inc. seeks approval by the Public Service Commission, Frankfort, Kentucky, of an adjustment of rates to become effective on and after August 1, 1999. The present rates charged in all territories served by Delta Natural Gas Company, Inc. are as follows:

PRESENT RATES

| | Base Rate | + | GCR | = | Total Rate |
|-------------------------|-----------|---|----------|---|-------------------|
| General Service | | | | | |
| Monthly Customer Charge | | | | | |
| Residential | \$ 8.00 | | | | \$ 8.00 |
| Small Commercial | \$ 18.36 | | | | \$ 18.36 |
| All Others | \$ 25.00 | | | | \$ 25.00 |
| 1 - 200 Mcf | \$ 2,7212 | | \$3.7706 | | \$ 6,4918 per Mcf |
| 200.1 - 1,000 Mcf | \$ 2,5000 | | \$3.7706 | | \$ 6,2706 per Mcf |
| 1,000.1 - 5,000 Mcf | \$ 2,1000 | | \$3.7706 | | \$ 5,8706 per Mcf |
| 5,000.1 - 10,000 Mcf | \$ 1,5000 | | \$3.7706 | | \$ 5,2706 per Mcf |
| Over 10,000 Mcf | \$ 1,1000 | | \$3.7706 | | \$ 4,8706 per Mcf |
| Interruptible | | | | | |
| Monthly Customer Charge | \$200.00 | | | | \$200.00 |
| 1 - 1,000 Mcf | \$ 1,7000 | | \$3.7706 | | \$ 5,4706 per Mcf |
| 1,000.1 - 5,000 Mcf | \$ 1,3000 | | \$3.7706 | | \$ 5,0706 per Mcf |
| 5,000.1 - 10,000 Mcf | \$ 9000 | | \$3.7706 | | \$ 4,6706 per Mcf |
| Over 10,000 Mcf | \$ 5000 | | \$3.7706 | | \$ 4,2706 per Mcf |

The proposed rates to be charged in all territories served by Delta Natural Gas Company Inc. are as follows:

PRESENT RATES

| | Base Rate | + | GCR | = | Total Rate |
|-------------------------|-----------|---|----------|---|-------------------|
| General Service | | | | | |
| Monthly Customer Charge | | | | | |
| Residential | \$ 8.00 | | | | \$ 8.00 |
| Small Commercial | \$ 17.00 | | | | \$ 17.00 |
| All Others | \$ 50.00 | | | | \$ 50.00 |
| 1 - 200 Mcf | \$ 3,4787 | | \$3.7706 | | \$ 7,2493 per Mcf |
| 200.1 - 1,000 Mcf | \$ 1,8500 | | \$3.7706 | | \$ 5,6206 per Mcf |
| 1,000.1 - 5,000 Mcf | \$ 1,4500 | | \$3.7706 | | \$ 5,2206 per Mcf |
| 5,000.1 - 10,000 Mcf | \$ 1,0500 | | \$3.7706 | | \$ 4,8206 per Mcf |
| Over 10,000 Mcf | \$ 8500 | | \$3.7706 | | \$ 4,6206 per Mcf |
| Interruptible | | | | | |
| Monthly Customer Charge | \$ 250.00 | | | | \$250.00 |
| 1 - 1,000 Mcf | \$ 1,6000 | | \$3.7706 | | \$ 5,3706 per Mcf |
| 1,000.1 - 5,000 Mcf | \$ 1,2000 | | \$3.7706 | | \$ 4,9706 per Mcf |
| 5,000.1 - 10,000 Mcf | \$ 8000 | | \$3.7706 | | \$ 4,5706 per Mcf |
| Over 10,000 Mcf | \$ 6000 | | \$3.7706 | | \$ 4,3706 per Mcf |

Delta Natural Gas Company, Inc. proposes the following new tariffs: Weather Normalization Adjustment Clause Applicable to General Service Rate Schedule and Experimental Alternative Rate-making Mechanism.

In addition, Delta Natural Gas Company, Inc. proposes changes to the text of the following tariffs: 1) General Service and Interruptible Rates, 2) Transportation of Gas for Others Off System Utilization - Terms and Conditions, 3) Standby Service Rate Schedule - Rates, 4) Rules and Regulations - Applicability, Company's Rules and Regulations, Rules and Regulations May Be Amended, Customer's Liability, Deposits, Monthly Bills, and Customer's Equipment (and Installation). Copies of the proposed tariffs containing text changes may be obtained by contacting John F. Hall, Delta Natural Gas Company, Inc., at the address and telephone number shown below.

The foregoing rates reflect a proposed increase in revenues of approximately 6.76% to Delta Natural Gas Company, Inc. The estimated amount of increase/decrease per customer class is as follows: Residential GS: \$1,954,816, 9.85%; Small Commercial GS: \$418,957, 7.85%; Large Commercial and Industrial GS: \$242,480, 2.79%; Interruptible: \$(105,352), (4.81)%.



United States
Department of
Agriculture

Rural
Development

771 Corporate Drive, Suite 200
Lexington, KY 40503-5477
(606) 224-7336 TTY(606) 224-7422

November 25, 1997

COPY

Mr. Carl Waits, Chairman
Jessamine County Water District No. 1
Nicholasville, Kentucky 40356

Dear Mr. Waits:

This letter establishes conditions which must be understood and agreed to by you before further consideration may be given to the application. The (loan and/or grant) will be administered on behalf of the Rural Utilities Service (RUS) by the State and Area office staff of USDA, Rural Development. Any changes in project cost, source of funds, scope of services or any other significant changes in the project or applicant must be reported to and approved by USDA, Rural Development, by written amendment to this letter. Any changes not approved by Rural Development shall be cause for discontinuing processing of the application. It should also be understood that Rural Development is under no obligation to provide additional funds to meet an overrun in construction costs.

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This letter is not to be considered as loan or grant approval or as a representation as to the availability of funds. The docket may be completed on the basis of an RUS loan not to exceed \$1,194,000.

If Rural Development makes the loan, you may make a written request that the interest rate be the lower of the rate in effect at the time of loan approval or the time of loan closing. If you do not request the lower of the two interest rates, the interest rate charged will be the rate in effect at the time of loan approval. The loan will be considered approved on the date a signed copy of Form RD 1940-1, "Request for Obligation of Funds," is mailed to you. If you want the lower of the two rates, your written request should be submitted to Rural Development as soon as practical. In order to avoid possible delays in loan closing, such a request should ordinarily be submitted at least 30 days before loan closing.

Please complete and return the attached Form RD 1942-46, "Letter of Intent to Meet Conditions," if you desire that further consideration be given to your application.

The "Letter of Intent to Meet Conditions" must be executed within three weeks from the date of this letter or it becomes invalid unless a time extension is granted by Rural Development.

If the conditions set forth in this letter are not met within 240 days from the date hereof, Rural Development reserves the right to discontinue the processing of the application.

In signing Form RD 1942-46, you are agreeing to complete the following as expeditiously as possible:

1. Number of Users and Their Contribution:

There shall be 756 existing water users. The Rural Development Manager will review and authenticate the number of users and amount of connection fees prior to advertising for construction bids. No contribution is required from the Water District.

2. Repayment Period:

The loan will be scheduled for repayment over a period not to exceed 40 years from the date of the bond. Principal payment will not be deferred for a period in excess of two (2) years from the date of the bond. Payments will be in accordance with applicable KRS which requires interest to be paid semi-annually (January 1st and July 1st) and principal will be due on or before the first of January. Rural Development may require the Water District to adopt a supplemental payment agreement providing for monthly payments of principal and interest so long as the bond is held or insured by RUS. Monthly payments will be approximate amortized installments.

Rural Development encourages the use of the Preauthorized Debit (PAD) payment process, which authorizes the electronic withdrawal of funds from your bank account on the exact installment payment due date (contact the Rural Development Manager for further information).

3. Funded Depreciation Reserve Account:

The Water District will be required to deposit \$620.00 per month into a "Funded Depreciation Reserve Account". The monthly deposits are for the life of the loan.

The required deposits to the Reserve Account are in addition to the requirements of the Water District's prior bond resolutions.

The annual deposit to the Reserve Account are required to commence the first full fiscal year after the facility becomes operational.

4. Security Requirements:

A pledge of gross water revenue will be provided in the Bond Resolution. Bonds shall rank on a parity with existing bonds.

5. Land Rights and Real Property:

The Water District will be required to furnish satisfactory title, easements, etc., necessary to install, maintain and operate the facility to serve the intended users. The pipelines will be on private rights-of-way where feasible. State and County rights-of-way will be used only in instances where necessary and properly justified. Easements and options are to be secured prior to advertising for construction bids.

6. Organization:

The Water District will be legally organized under applicable KRS which will permit them to perform this service, borrow and repay money.

7. Business Operations:

The Water District will be required to operate the system under a well-established set of resolutions, rules and regulations. A budget must be established annually and adopted by the Water District after review by Rural Development. At no later than loan pre-closing, the Water District will be required to furnish a prior approved management plan to include, as a minimum, provisions for management, maintenance, meter reading, miscellaneous services, billing, collecting, bookkeeping, making and delivering required reports and audits.

8. Accounts, Records and Audits:

The Water District will be required to maintain adequate records and accounts and submit annual budgets and year-end reports (annual audits) in accordance with subsection 1780.47 of RUS Instruction 1780 and RUS Staff Instruction 1780-4, a copy of which is enclosed.

9. Accomplish Audits for Years in Which Federal Financial Assistance is Received:

The Water District will accomplish audits in accordance with OMB Circular A-133, during the years in which federal funds are received. The Water District will provide copies of the audits to the Area Office and the appropriate Federal cognizant agency as designated by OMB Circular A-133.

10. Insurance and Bonding:

The following insurance and bonding will be required:

- A. Adequate Liability and Property Damage Insurance including vehicular coverage, if applicable, must be obtained and maintained by the Water District. The Water District should obtain amounts of coverage as recommended by its attorney, consulting engineer and/or insurance provider.

- B. Worker's Compensation - The Water District will carry worker's compensation insurance for employees in accordance with applicable state laws.
- C. Fidelity Bond - The Water District will provide Fidelity Bond Coverage for all persons who have access to funds. Coverage may be provided either for all individual positions or persons, or through "blanket" coverage providing protection for all appropriate employees and/or officials. The amount of coverage required for all RUS loans is \$110,000.
- D. Real Property Insurance - The Water District will obtain and maintain adequate fire and extended coverage on all structures including major items of equipment or machinery located in the structures. The amounts of coverage should be based on recommendations obtained by the Water District from its attorney, consulting engineer and/or insurance provider. Subsurface lift stations do not have to be covered except for the value of electrical and pumping equipment therein.
- E. Flood Insurance - The Water District will obtain and maintain adequate coverage on any facilities located in a special flood and mudslide prone areas.

11. Planning and Performing Development:

- A. The engineer should not be authorized to commence work on final plans and specifications until a determination has been made that the project can be planned and constructed within the estimated cost shown in paragraph "20" of this letter. When this determination has been made, Rural Development should be so advised by letter. The engineer may then proceed to develop final plans and specifications to be completed no later than 210 days from this date, and prepare bid documents. The Rural Development Manager is prepared to furnish the necessary guide for him to follow so as to keep the project plans and documents within our guidelines and requirements. The project should not be advertised for construction bids until all easements and enforceable options have been obtained, and total funds are committed or available for the project.
- B. The following documents will be submitted to Rural Development for review and must be concurred in by Rural Development prior to advertisement for construction bids:
 - 1. Final plans, specifications and bid documents.
 - 2. Applicant's letter on efforts to encourage efforts to encourage small business and minority-owned business participation.
 - 3. Legal Service Agreements.
 - 4. Engineering Agreements.

Revision in these documents will be subject to Rural Development concurrence. Any agreements, contracts, etc. not reviewed and approved by Rural Development will not be eligible for payment from project funds or revenues from facilities financed by this Agency.

Prior to receipt of an authorization to advertise for construction bids, the Water District will obtain advance clearance from Bond Counsel regarding compliance with KRS 424 pertaining to publishing of the advertisement for construction bids in local newspapers and the period of time the notice is required to be published.

12. Compliance with Section 504 of the Rehabilitation Act of 1973:

The Water District will be required to comply with Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), in order to make sure no handicapped individual, solely by reason of their handicap, is excluded from participation in the use of the water system, be denied the benefits of the water system, or be subjected to discrimination.

13. Closing Instructions:

The Office of General Counsel, our Regional Attorney, will be required to write closing instructions in connection with this loan. Conditions listed therein must be met by the Water District.

14. Compliance with Special Laws and Regulations:

The Water District will be required to conform with any and all state and local laws and regulations affecting this type project.

15. System Operator:

The Water District is reminded that the system operator must have an Operator's Certificate issued by the State.

16. Prior to Pre-Closing the Loan, the Water District will be Required to Adopt:

- A. Form RD 1942-47, "Association Loan Resolution (Public Body)."
- B. Form RD 400-1, "Equal Opportunity Agreement."
- C. Form RD 400-4, "Assurance Agreement."
- D. Form AD-1047, "Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transaction."
- E. Form RD 1910-11, "Applicant Certification Federal Collection Policies for Consumer or Commercial Debts."
- F. FmHA Instruction 1940-Q, Exhibit A-1, "Certification for Contracts, Grants and Loans."

The Water District must offer the opportunity for all residents in the service area to become users of the facilities regardless of race, creed, color, religion, sex, national origin, marital status, physical or mental handicap or level of income.

17. Refinancing and Graduation Requirements:

The Water District is reminded that if at any time it shall appear to the Government that the Water District is able to refinance the amount of the RUS indebtedness then outstanding, in whole or in part, by obtaining a loan from commercial sources at reasonable rates and terms, upon the request of the Government, the Water District will apply for and accept such loan in sufficient amount to repay the Government.

18. Commercial Interim Financing:

The Water District will be required to use commercial interim financing for the project during construction for the RUS loan portion of the financing, if available at reasonable rates and terms.

Before the loan is closed, the Water District will be required to provide Rural Development with statements from the contractor, engineer and attorneys that they have been paid to date in accordance with their contract or other agreements and, in the case of the contractor, that he has paid his suppliers and sub-contractors.

19. Disbursement of Project Funds:

A construction account for the purpose of disbursement of project funds (RUS) will be established by the Water District prior to start of construction. The position of officials entrusted with the receipt and disbursement of RUS project funds will be covered by a "Fidelity Bond," with USDA-Rural Development as Co-Obligee, in the amount of construction funds on hand at any one time during the construction phase.

During construction, the Water District shall disburse project funds in a manner consistent with subsection 1780.76 (e) of RUS Instruction 1780. Form RD 1924-18, "Partial Payment Estimate," or similar form approved by Rural Development, shall be used for the purpose of documenting periodic construction estimates, and shall be submitted to Rural Development for review and acceptance. Prior to disbursement of funds by the Water District, the Board of Directors shall review and approve each payment estimate. All bills and vouchers must be approved by Rural Development prior to payment by the Water District.

Form RD 440-11, "Estimate of Funds Needed for 30-Day Period Commencing _____," will be prepared by the Water District and submitted to Rural Development in order that a periodic advance of federal cash may be requested.

Monthly audits of the Water District's construction account records shall be made by Rural Development.

20. Cost of Facility:

Breakdown of Costs:

| | |
|--------------------------|---------------|
| Development | \$ 895,000 |
| Land and Rights | 15,000 |
| Legal and Administrative | 20,000 |
| Engineering | 154,000 |
| Interest | 20,000 |
| Contingencies | <u>90,000</u> |
| TOTAL | \$ 1,194,000 |

Financing:

| | |
|----------|---------------------|
| RUS Loan | \$ <u>1,194,000</u> |
| TOTAL | \$ 1,194,000 |

22. Rates and Charges:

Rates and charges for facilities and services rendered by the Water District must be at least adequate to meet cost of maintaining, repairing and operating the water system and meeting required principal and interest payments and the required deposits to debt service and/or depreciation reserve.

Water rates will be at least:

First 3,000 gallons @ \$18.00 - Minimum Bill.
 Next 7,000 gallons @ \$ 4.20 - per 1,000 gallons.
 All Over 10,000 gallons @ \$ 4.10 - per 1,000 gallons.

22. Water Purchase Contract:

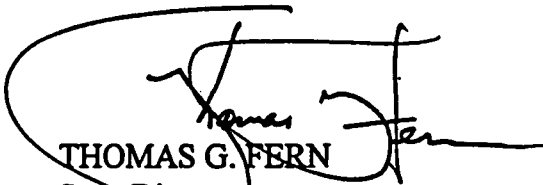
The Water District will submit a Water Purchase Contract for approval by Rural Development before advertising for construction bids. If the contract is not on Form RD 442-30, "Water Purchase Contract," the contract will require approval by our Regional Attorney. The contract must meet the requirements of subsection 1780.62 of RUS Instruction 1780.

23. Final Approval Conditions:

Final approval of this loan will depend on your willingness, with the assistance of all your co-workers, to meet the conditions of this letter in an orderly and systematic manner. Then too, final approval will depend on funds being available.

If you desire to proceed with your application, the Rural Development Manager will allot a reasonable portion of his time to provide guidance in application processing.

Sincerely,

A handwritten signature in black ink, appearing to read "Thomas G. Fern", is written over a large, stylized circular flourish.

THOMAS G. FERN
State Director
Rural Development

Enclosures

cc: Rural Development Manager - Shelbyville, KY
Community Development Manager - Nicholasville, KY
Bluegrass ADD - Lexington, KY
Martin D. East - Nicholasville, KY
Henry M. Reed - Louisville, KY
HMB - Frankfort, KY
PSC - ATTN: Claude Rhorer - Frankfort, KY

A

BORROWER NAME: JESSAMINE COUNTY WATER DISTRICT NO. 1
 INTEREST RATE: 5.375
 PRINCIPAL: 1,194,000
 June 28, 1999

| year | period | number | payment | interest | principal | balance |
|------|--------|--------|--------------|--------------|-----------|-----------|
| ---- | ----- | ----- | ----- | ----- | ----- | ----- |
| 2000 | 1 | 1 | 64,177.50 | 64,177.50 | 0 | 1,194,000 |
| 2001 | 1 | 2 | 64,177.50 | 64,177.50 | 0 | 1,194,000 |
| 2002 | 1 | 3 | 74,177.50 | 64,177.50 | 10,000 | 1,184,000 |
| 2003 | 1 | 4 | 74,640.00 | 63,640.00 | 11,000 | 1,173,000 |
| 2004 | 1 | 5 | 74,048.75 | 63,048.75 | 11,000 | 1,162,000 |
| 2005 | 1 | 6 | 74,457.50 | 62,457.50 | 12,000 | 1,150,000 |
| 2006 | 1 | 7 | 74,312.50 | 61,812.50 | 12,500 | 1,137,500 |
| 2007 | 1 | 8 | 74,140.63 | 61,140.63 | 13,000 | 1,124,500 |
| 2008 | 1 | 9 | 74,441.88 | 60,441.88 | 14,000 | 1,110,500 |
| 2009 | 1 | 10 | 74,189.38 | 59,689.38 | 14,500 | 1,096,000 |
| 2010 | 1 | 11 | 74,410.00 | 58,910.00 | 15,500 | 1,080,500 |
| 2011 | 1 | 12 | 74,076.88 | 58,076.88 | 16,000 | 1,064,500 |
| 2012 | 1 | 13 | 74,716.88 | 57,216.88 | 17,500 | 1,047,000 |
| 2013 | 1 | 14 | 74,276.25 | 56,276.25 | 18,000 | 1,029,000 |
| 2014 | 1 | 15 | 74,308.75 | 55,308.75 | 19,000 | 1,010,000 |
| 2015 | 1 | 16 | 74,287.50 | 54,287.50 | 20,000 | 990,000 |
| 2016 | 1 | 17 | 74,212.50 | 53,212.50 | 21,000 | 969,000 |
| 2017 | 1 | 18 | 74,583.75 | 52,083.75 | 22,500 | 946,500 |
| 2018 | 1 | 19 | 74,374.38 | 50,874.38 | 23,500 | 923,000 |
| 2019 | 1 | 20 | 74,111.25 | 49,611.25 | 24,500 | 898,500 |
| 2020 | 1 | 21 | 74,294.38 | 48,294.38 | 26,000 | 872,500 |
| 2021 | 1 | 22 | 74,396.88 | 46,896.88 | 27,500 | 845,000 |
| 2022 | 1 | 23 | 74,418.75 | 45,418.75 | 29,000 | 816,000 |
| 2023 | 1 | 24 | 74,360.00 | 43,860.00 | 30,500 | 785,500 |
| 2024 | 1 | 25 | 74,220.63 | 42,220.63 | 32,000 | 753,500 |
| 2025 | 1 | 26 | 74,500.63 | 40,500.63 | 34,000 | 719,500 |
| 2026 | 1 | 27 | 74,173.13 | 38,673.13 | 35,500 | 684,000 |
| 2027 | 1 | 28 | 74,265.00 | 36,765.00 | 37,500 | 646,500 |
| 2028 | 1 | 29 | 74,249.38 | 34,749.38 | 39,500 | 607,000 |
| 2029 | 1 | 30 | 74,626.25 | 32,626.25 | 42,000 | 565,000 |
| 2030 | 1 | 31 | 74,368.75 | 30,368.75 | 44,000 | 521,000 |
| 2031 | 1 | 32 | 74,503.75 | 28,003.75 | 46,500 | 474,500 |
| 2032 | 1 | 33 | 74,504.38 | 25,504.38 | 49,000 | 425,500 |
| 2033 | 1 | 34 | 74,370.63 | 22,870.63 | 51,500 | 374,000 |
| 2034 | 1 | 35 | 74,102.50 | 20,102.50 | 54,000 | 320,000 |
| 2035 | 1 | 36 | 74,700.00 | 17,200.00 | 57,500 | 262,500 |
| 2035 | 1 | 37 | 74,109.38 | 14,109.38 | 60,000 | 202,500 |
| 2037 | 1 | 38 | 74,384.38 | 10,884.38 | 63,500 | 139,000 |
| 2038 | 1 | 39 | 74,471.25 | 7,471.25 | 67,000 | 72,000 |
| 2039 | 1 | 40 | 75,870.00 | 3,870.00 | 72,000 | 0 |
| | | | 2,955,011.33 | 1,761,011.33 | 1,194,000 | |



United States
Department of
Agriculture

Rural
Development

.71 Corporate Drive, Suite 200
Lexington, KY 40503-5477
(606) 224-7336 TTY (606) 224-7422

June 11, 1999

Mr. Carl Waits, Chairman
Jessamine County Water District No. 1
200 West Maple Street
Nicholasville, Kentucky 40356

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

of pages = 2

| | |
|--------------------------------|--|
| To <i>Henry M. Reed III</i> | From <i>Floyd - RD</i> |
| Dept./Agency | Phone # <i>502-633-6391</i> |
| Fax # <i>502-899-3882</i> | Fax # <i>502-633-6552</i> |
| NSN 7540-01-217-7368 | 9099-101 GENERAL SERVICES ADMINISTRATION |

Re: Letter of Conditions Dated November 25, 1997

Dear Mr. Waits:

This letter shall serve as Amendment No. 1 to your Letter of Conditions dated November 25, 1997. The purpose of the amendment is to revise the total cost of the facility due to a construction bid overrun and make other necessary changes.

The Second Paragraph on the First Page is revised to read as follows:

" This letter is not to be considered as loan approval or as a representation as to the availability of funds. The docket may be completed on the basis of a RUS loan not to exceed \$1,492,000. "

Paragraph numbered "1" is revised to read as follows:

" 1. Number of Users and Their Contribution:

There shall be 884 existing water users. The Rural Development Manager will review and authenticate the number of users and amount of connection fees prior to advertising for construction bids. No contribution is required from the Water District. "

Paragraph numbered "3" is revised to read as follows:

" 3. Funded Depreciation Reserve Account:

The Water District will be required to deposit \$770.00 per month into a "Funded Depreciation Reserve Account." The monthly deposits are for the life of the loan.

The required deposits to the Reserve Account are in addition to the requirements of the Water district's prior bond resolutions.

The monthly deposits to the Reserve Account are required to commence the first full fiscal year after the facility becomes operational. "

Rural Development is an Equal Opportunity Lender.
Complaints of discrimination should be sent to:
Secretary of Agriculture, Washington, D.C. 20250

Paragraph "10(C)" is revised to read as follows:

- " 10. C. Fidelity Bond - The Water District will provide Fidelity Bond Coverage for all persons who have access to funds. Coverage may be provided either for all individual positions or persons, or through "blanket" coverage providing protection for all appropriate employees and/or officials. The amount of coverage required for all RUS loans is \$128,000. "

Paragraph numbered "20" is revised to read as follows:

" 20. Cost of Facility:

Breakdown of Costs:

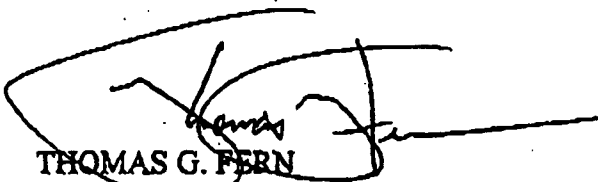
| | |
|--------------------------|---------------|
| Development | \$ 1,203,000 |
| Land and Rights | 20,000 |
| Legal and Administrative | 20,000 |
| Engineering | 183,100 |
| Interest | 20,000 |
| Contingencies | <u>45,900</u> |
| TOTAL | \$ 1,492,000 |

Financing:

| | |
|----------|---------------------|
| RUS Loan | \$ <u>1,492,000</u> |
| TOTAL | \$ 1,492,000 " |

All other provisions of the referenced Letter of Conditions remain in full force and unchanged.

Sincerely,



THOMAS G. FERN
State Director
Rural Development

- cc: ✓ Rural Development Manager - Shelbyville, Kentucky
- Community Development Manager - Nicholasville, Kentucky
- Bluegrass ADD - Lexington, Kentucky
- Martin D. East - Nicholasville, Kentucky
- Henry M. Reed - Louisville, Kentucky
- HMB, Inc. - Frankfort, Kentucky
- PSC - ATTN: Claude Rhorer - Frankfort, Kentucky

BORROWER NAME: JESSAMINE COUNTY WATER DISTRICT NO. 1
 INTEREST RATE: 5
 PRINCIPAL: 298,000
 June 28, 1999

| year | period | number | payment | interest | principal | balance |
|------|--------|--------|------------|------------|-----------|---------|
| 2000 | 1 | 1 | 14,900.00 | 14,900.00 | 0 | 298,000 |
| 2001 | 1 | 2 | 14,900.00 | 14,900.00 | 0 | 298,000 |
| 2002 | 1 | 3 | 17,700.00 | 14,900.00 | 2,800 | 295,200 |
| 2003 | 1 | 4 | 17,660.00 | 14,760.00 | 2,900 | 292,300 |
| 2004 | 1 | 5 | 17,715.00 | 14,615.00 | 3,100 | 289,200 |
| 2005 | 1 | 6 | 17,660.00 | 14,460.00 | 3,200 | 286,000 |
| 2006 | 1 | 7 | 17,700.00 | 14,300.00 | 3,400 | 282,600 |
| 2007 | 1 | 8 | 17,630.00 | 14,130.00 | 3,500 | 279,100 |
| 2008 | 1 | 9 | 17,655.00 | 13,955.00 | 3,700 | 275,400 |
| 2009 | 1 | 10 | 17,670.00 | 13,770.00 | 3,900 | 271,500 |
| 2010 | 1 | 11 | 17,675.00 | 13,575.00 | 4,100 | 267,400 |
| 2011 | 1 | 12 | 17,670.00 | 13,370.00 | 4,300 | 263,100 |
| 2012 | 1 | 13 | 17,655.00 | 13,155.00 | 4,500 | 258,600 |
| 2013 | 1 | 14 | 17,630.00 | 12,930.00 | 4,700 | 253,900 |
| 2014 | 1 | 15 | 17,695.00 | 12,695.00 | 5,000 | 248,900 |
| 2015 | 1 | 16 | 17,645.00 | 12,445.00 | 5,200 | 243,700 |
| 2016 | 1 | 17 | 17,685.00 | 12,185.00 | 5,500 | 238,200 |
| 2017 | 1 | 18 | 17,610.00 | 11,910.00 | 5,700 | 232,500 |
| 2018 | 1 | 19 | 17,725.00 | 11,625.00 | 6,100 | 226,400 |
| 2019 | 1 | 20 | 17,620.00 | 11,320.00 | 6,300 | 220,100 |
| 2020 | 1 | 21 | 17,705.00 | 11,005.00 | 6,700 | 213,400 |
| 2021 | 1 | 22 | 17,670.00 | 10,670.00 | 7,000 | 206,400 |
| 2022 | 1 | 23 | 17,620.00 | 10,320.00 | 7,300 | 199,100 |
| 2023 | 1 | 24 | 17,655.00 | 9,955.00 | 7,700 | 191,400 |
| 2024 | 1 | 25 | 17,670.00 | 9,570.00 | 8,100 | 183,300 |
| 2025 | 1 | 26 | 17,665.00 | 9,165.00 | 8,500 | 174,800 |
| 2026 | 1 | 27 | 17,640.00 | 8,740.00 | 8,900 | 165,900 |
| 2027 | 1 | 28 | 17,695.00 | 8,295.00 | 9,400 | 156,500 |
| 2028 | 1 | 29 | 17,625.00 | 7,825.00 | 9,800 | 146,700 |
| 2029 | 1 | 30 | 17,735.00 | 7,335.00 | 10,400 | 136,300 |
| 2030 | 1 | 31 | 17,615.00 | 6,815.00 | 10,800 | 125,500 |
| 2031 | 1 | 32 | 17,675.00 | 6,275.00 | 11,400 | 114,100 |
| 2032 | 1 | 33 | 17,705.00 | 5,705.00 | 12,000 | 102,100 |
| 2033 | 1 | 34 | 17,605.00 | 5,105.00 | 12,500 | 89,600 |
| 2034 | 1 | 35 | 17,680.00 | 4,480.00 | 13,200 | 76,400 |
| 2035 | 1 | 36 | 17,620.00 | 3,820.00 | 13,800 | 62,600 |
| 2036 | 1 | 37 | 17,730.00 | 3,130.00 | 14,600 | 48,000 |
| 2037 | 1 | 38 | 17,600.00 | 2,400.00 | 15,200 | 32,800 |
| 2038 | 1 | 39 | 17,740.00 | 1,640.00 | 16,100 | 16,700 |
| 2039 | 1 | 40 | 17,535.00 | 835.00 | 16,700 | 0 |
| | | | 700,985.00 | 402,985.00 | 298,000 | |

**CERTIFICATION OF DISTRICT CHAIRMAN REGARDING COMPLIANCE
WITH PUBLIC SERVICE COMMISSION REQUIREMENTS**

The undersigned certifies that he is the duly authorized and acting Chairman of the Jessamine County Water District No. 1 (the "District") which intends to file with the Public Service Commission of Kentucky ("PSC") a Petition seeking a Certificate of Public Convenience and Necessity in connection with the construction of additions, extensions, and improvements to the District's water distribution system, consisting of the construction and installation of a one million gallon elevated water tank and accompanying booster pump station and radio telemetry system, as further identified in said Petition (the "Project").

The undersigned has executed this Certificate in reliance upon information and advice of Haworth, Meyer & Boleyn, Inc., Frankfort, Kentucky (the "Engineers") which firm has been retained by the District to provide engineering services in connection with the Project.

The undersigned states that the proposed plans and specifications for the Project have been designed to meet the minimum construction and operating requirements established in 807 KAR 5:066, Section 4(3) and (4), Section 5(1), Sections 6 and 7, Section 8(1) through (3), Section 9(1) and Section 10.

The undersigned states that all other State approvals or permits have been obtained.

The undersigned further certifies that the Project is to be financed through the issuance of the District's Water Revenue Bonds, Series of 1999, in the principal amount \$1,492,000 (the "Bonds") which are to be sold to the United States of America, acting through the U.S. Department of Agriculture Rural Development ("USDARD").

Based upon the information supplied by the Engineers, it is estimated that construction of the Project will commence on or about July 30, 1999 and end on or about December 30, 1999, approximately 152 days.

Based upon the advice of the Engineers and USDARD, the undersigned believes that an increase in water rates will be required by the District as follows to meet the expenses incident to the operation and maintenance of the District's water distribution system and pay and retire all of the District's outstanding Water Revenue Bonds.

| <u>Usage</u> | <u>Proposed Charges</u> | <u>Existing Charges</u> (Effective 5/15/95) |
|-------------------------|-------------------------|--|
| First 3,000 gallons | \$18.00 Minimum Bill | \$15.33 Minimum Bill |
| Next 7,000 gallons | 4.20 per 1,000 gallons | 3.16 per 1,000 gallons |
| All Over 10,000 gallons | 4.10 per 1,000 gallons | 2.86 per 1,000 gallons |

Dated this 28th day of June, 1999.

JESSAMINE COUNTY WATER DISTRICT NO. 1



Carl Waits,
Chairman

AN ORDINANCE OF THE BOARD OF COMMISSIONERS OF JESSAMINE COUNTY WATER DISTRICT NO. 1 AMENDING RATES AND CHARGES FOR WATER SERVICE PROVIDED BY THE DISTRICT.

WHEREAS, Jessamine County Water District No. 1 (the "District") has or will apply to the Kentucky Public Service Commission for a Certificate of Public Convenience and Necessity authorizing and permitting said District to construct water distribution system improvements consisting of construction and installation of a one million gallon elevated water tank and accompanying booster pump station and radio telemetry system (the "Project"), and,

WHEREAS, the District proposes to finance said Project through the issuance of \$1,492,000 of the District's "Water Revenue Bonds, Series of 1999," (the "Bonds") to the United States Department of Agriculture, Rural Development ("USDARD"), and,

WHEREAS, the District has applied to the Kentucky Public Service Commission for a Certificate of Public Convenience and Necessity and approval of a Schedule of Rates and Charges for water service in accordance with the USDARD Letter of Conditions:

NOW, THEREFORE, BE IT AND IT IS HEREBY ORDAINED BY THE BOARD OF COMMISSIONERS OF THE JESSAMINE COUNTY WATER DISTRICT NO. 1 AS FOLLOWS:

1. That subject to PSC approval commencing with the billing period corresponding to the month of August, 1999, the District's rates and charges for water service shall be as follows:

| <u>Usage</u> | <u>Proposed Charges</u> | <u>Existing Charges</u> (Effective 5/15/95) |
|-------------------------|-------------------------|--|
| First 3,000 gallons | \$18.00 Minimum Bill | \$15.33 Minimum Bill |
| Next 7,000 gallons | 4.20 per 1,000 gallons | 3.16 per 1,000 gallons |
| All Over 10,000 gallons | 4.10 per 1,000 gallons | 2.86 per 1,000 gallons |

2. That all other rates and charges not specifically mentioned herein shall remain as presently effective.

3. That all ordinances or parts thereof and resolutions of the District in conflict with the provisions of this Ordinance are hereby repealed to the extent of such conflict.

4. That this Ordinance shall become effective upon its adoption and approval of the Public Service Commission.

Passed and adopted this 1st day of July, 1999.

JESSAMINE COUNTY WATER DISTRICT NO.1

Carl Waits
Chairman

Attest:

Randy M. Lanson
acting Secretary



June 24, 1999

SUBJECT: Jessamine County Water District No. 1
Concurrence in Contract Award

TO: Rural Development Manager
Shelbyville, Kentucky

Based on the bids received and the recommendation of the consulting engineer, Rural Development concurs in the award of a contract for construction of an elevated water storage tank to Caldwell Tanks, Inc. in the amount of \$1,135,200.

for *Vernon Abner*
THOMAS G. FERN
State Director
Rural Development

cc: HMB, Inc.
Frankfort, Kentucky

✓ Henry M. Reed, III
Louisville, Kentucky

James L. Haworth, P.E. - Retired
Fred A. Meyer, P.E., L.A.
Philip Boleyn, P.E., L.A.
Bob Blankenship, P.E.

Haworth, Meyer & Boleyn, Inc.

James H. Smith, P.E., L.S.
Bradley M. Meyer, P.E., L.S.
Joseph C. Pyles, P.E.
Karen Wood



ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
U.S. 460
Frankfort, KY 40601

Office: (502) 695-9800
Fax: (502) 695-9810

September 28, 1998

Mr. Gene Floyd
Rural Development
P.O. Box 1227
Shelbyville, KY 40066

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

RE: Jessamine County Water District
Water Storage Tank Project
HMB Project No: 430.00

Dear Mr. Floyd:

In regard to our request to advertise and bid the referenced project, I spoke with Mr. Vernon Brown today concerning the letter of non-pollution. He stated that this item is no longer required. Also, the Division of Water approval dated September 3, 1998 states that a stream crossing permit is not required.

If you need additional information please contact our office.

Sincerely,

HAWORTH, MEYER & BOLEYN, INC.

A handwritten signature in cursive script that reads 'Larry W. Cann'. The signature is written in dark ink and is positioned above the typed name and title.

Larry W. Cann
Project Manager

LC/am

WATER\430\FLOYD1.LTR

442 Metroplex
Suite 105
Nashville, TN 37211
(615) 834-4335

624 West Main Street
Louisville, KY 40202
(502) 587-0875

2500 Fairlane Drive
Building 1, Suite 170
Montgomery, AL 36116
(334) 277-1002

325 Sixth Avenue
South Charleston, WV 25303
(304) 744-5200

1410 Charlestown-New Albany Pike
Suite 201
Jeffersonville, IN 47130
(812) 288-8961

James L. Haworth, P.E. - Retired
Fred A. Meyer, P.E., L.A.
Philip Boleyn, P.E., L.A.
Bob Blankenship, P.E.



Haworth, Meyer & Boleyn, Inc.

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Bradley M. Meyer, P.E., L.S.
Joseph C. Pyles, P.E.
Karen Wood

ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
U.S. 460
Frankfort, KY 40601

Office: (502) 695-9800
Fax: (502) 695-9810

May 24, 1999

Public Service Commission
P.O. Box 615
Frankfort, KY 40602

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

RE: Elevated Water Tank Project
Jessamine County Water District #1
HMB #430

The above referenced project is due to start construction on July 27 ±, 1999 and end in July, 2000.

If you have any questions or comments, please call.

Sincerely,

HAWORTH, MEYER & BOLEYN, INC.

A handwritten signature in dark ink, appearing to read 'Bob Blankenship', is written over the typed name. The signature is fluid and cursive, with the first letters of each word being capitalized and prominent.

Bob Blankenship, P.E.

cc: JCWD #1
Henry Reed III

442 Metroplex
Suite 105
Nashville, TN 37211
(615) 834-4335

624 West Main Street
Louisville, KY 40202
(502) 587-0875

2500 Fairlane Drive
Building 1, Suite 170
Montgomery, AL 36116
(334) 277-1002

325 Sixth Avenue
South Charleston, WV 25303
(304) 744-5200

1410 Charlestown-New Albany Pike
Suite 201
Jeffersonville, IN 47130
(812) 288-8961

RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

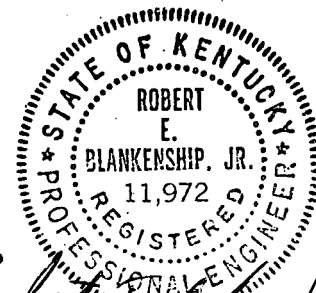
**PRELIMINARY ENGINEERING REPORT
ELEVATED WATER TANK PROJECT
JESSAMINE COUNTY WATER DISTRICT NO.1
NICHOLASVILLE, JESSAMINE COUNTY, KENTUCKY**

#430

April, 1997

Prepared By:

**Haworth, Meyer & Boleyn, Inc.
3 HMB Circle
US 460 Georgetown Road
Frankfort, KY 40601**



Robert E. Blankenship, Jr.

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I. SUMMARY

The Jessamine County Water District #1 (JCWD #1) proposes to improve water service to its existing customers and service area. This shall be accomplished by constructing a one million gallon (1 MG) elevated water tank. The project components are:

Base Project

- 1 MG Elevated Water Tank
- Booster Pump Station (350-500 gpm)
- Radio Telemetry System
- 1 Main Line PRV
- 1 Check Valve & Vault
- 1 Electrically Operated Butterfly Valve & Vault
- 3000' of 12" Water Line & Appurtenances
- Retrofit Individual PRV's on Existing Services
- No New Customers

Add-On Line

- 2000' ± Cross Country Connector Line from Industrial Park to Vincewood Drive.

Preliminary cost estimates for the base project are summarized in Tables 1 & 2.

The proposed financing package is:

| | |
|-------------------------|-------------------|
| Tap Fees ⁽¹⁾ | \$0 |
| RD Loan | \$1,194,000 |
| RD Grant | \$ <u> 0</u> |
| Total Funding | \$1,194,000 |

NOTE:

⁽¹⁾There are no new customers in the proposed project.

The project should benefit the entire Water District. It will provide additional storage capacity; as well as, realigning pressure zones to allow certain customers in a higher area to be served off of the proposed tank. This new tank will have an overflow elevation higher than the existing tank.

At times, the District has experienced low pressures and low flows in higher areas of the service area. In fact, the JCWD #1 was cited for these discrepancies in September 1995. They made temporary improvements to help alleviate the poor conditions and were put on one year probation by the Kentucky Division of Water (DOW). See the Rural Development (formerly FmHA/RECD) Environmental Assessment for documentation of these conditions.

Additionally, the Water District has insufficient water storage capacity in its system. The existing storage capacity is 250,000 gallons. In 1996, the District's average requirements were 260,000± gallons. The Public Service Commission

(PSC) cited the District in March 1997 for lack of adequate storage. See the RD Environmental Assessment for documentation.

The proposed project will not only add one million gallons of elevated storage to the system, but will also separate the system into two separate pressure zones. By revalving portions of the existing system, those customers currently experiencing low pressure and flow should realize an improvement in pressure (by changing to the higher pressure zone, pressures should increase by $20\pm$ psi). The addition of a new pressure zone will cause the realignment of customers in the system. The effect of this customer realignment will be to reduce the number of customers on the existing elevated tank; thus, "freeing up" more water for use in the northern half of the District's service area and causing the existing pump station to cycle less.

The proposed project will serve no new customers; rather, it will improve service to the existing 730 connections ($1123\pm$ customers). As with the current method of operation, the JCWD #1 will continue to purchase its water from the City of Nicholasville.

II. INTRODUCTION

This Preliminary Engineering Report will examine the proposed Elevated Water Tank Project for the Jessamine County Water District #1. This project will help eliminate existing health and sanitation hazards with regard to low flows and pressures and lack of adequate storage capacity for those persons currently living in the District's service area.

III. BACKGROUND & DESCRIPTION OF EXISTING SYSTEM

A. General

Jessamine County is located in central Kentucky along the Kentucky River. Nicholasville is the county seat, and is located approximately 10 miles south of Lexington. The project lies in northern Jessamine County. The economy is based on agriculture and manufacturing. The people derive their income primarily from farming, commercial and/or factory work in Nicholasville or Lexington.

The region has a potential for future growth due to the availability of building sites, transportation and relatively inexpensive and plentiful electricity. The US 27 corridor has grown dramatically over the last 10 years. This growth has stretched the District's existing infrastructure to its limit. Transportation facilities into and out of the area are considered to be very good at present. Major Kentucky highways providing access to the area are US 27 and US 68.

Nicholasville, the county seat, is governed by a Mayor and City Council. The County is governed by a Fiscal Court comprised of a Judge/Executive and Magistrates. The water system is directly under the supervision of the Jessamine County Water District #1. The Judge Executive nominates the Commissioners, and each must be approved by Fiscal Court. These Water Commissioners vote on all actions governing the water system at its monthly meeting. The District operates and maintains the system. Presently, the water system has in excess of 730 connections (which converts to 1123 ± customers).

The median income in the project area is well above the poverty level. It appears to be too high to warrant any grant and/or low/moderate interest rate loan from Rural Development (RD).

B. Existing System

The Jessamine County Water District #1 operates a water distribution system in northern Jessamine County. The district's boundaries start just north of the Orchard Shopping Center on the east side of US 27, and just north of the Hager property on the west side of US 27 and proceeds northward parallel to US 27 to the Fayette County line. The District extends both east and west of US 27 for a distance of 1½ miles each side for a total width of 3 miles.

The JCWD #1 was formed in 1957; it started operation in 1967. There have been two major construction projects; the first was water lines throughout the service area. The second was a 250,000 gallon elevated water tank. In the mid

1980's, the District, working in conjunction with the KyDOT, upgraded its major trunk line (parallel to US 27) from the mastermeter to the Fayette County line. They replaced 6" and 4" transite line with 10", 8" and 6" PVC water line. This was done when US 27 was widened; the District paid only the betterment costs.

All other extensions have been paid for by landowners and/or developers in the service area.

The Jessamine County Water District #1 currently purchases its water from the City of Nicholasville. Nicholasville pumps from the Kentucky River. It is felt that the source of water is adequate, as is, the City's treatment capacity. The JCWD #1 has a water purchase agreement with the City. The current contract expires in 2025; there is no maximum/minimum usage specified. It is felt that the contract period can easily be extended for an additional 20 to 25 years.

The existing consists of:

- 250,000 Gallon Elevated Water Tank (Overflow Elevation \approx 1170.5")
- 250 GPM Booster Pump Station
- 20 Miles \pm of 2" - 10" PVC & Ductile Iron Water Lines
- 730 \pm connections (1123 \pm customers)
- All water is purchased from City of Nicholasville
- 1996 records indicate 99,033,650 gallons were purchased from the City; while 92,767,940 gallons were sold by the District.

IV. PROPOSED ELEVATED WATER TANK PROJECT

The proposed elevated water tank will provide more storage to the system. Additionally, by constructing several control devices, the system's service area will be realigned so that existing customers (on high ground in a high use area) will be served by the new tank. This should allow the District to avoid problems experienced in the past where customers have been without water or had low pressures. It should also satisfy both the KY Division of Water and the PSC, who has cited the District on several occasions for the above conditions.

There is one add-on/connector line that is not included in the Base Project. This line would be constructed should funds be available after bidding the project.

Maps attached to this report present the proposed water system improvements.

V. COST SUMMARY

Table 1 presents the estimated construction cost for the Base Project. Table 2 summarizes the estimated project cost for the Base Project.

TABLE 1

ESTIMATED CONSTRUCTION COST - BASE PROJECT

| <u>ITEM #</u> | <u>ITEM</u> | <u>QUANTITY</u> | <u>UNIT</u> | <u>UNIT PRICE</u> | <u>TOTAL</u> |
|--|--|-----------------|-------------|-------------------|-------------------------|
| 1 | 12" Water Pipe, furnishing & laying | 3000 | LF | \$12.00 | \$36,000.00 |
| 2 | 10" Water Pipe, furnishing & laying | 100 | LF | 11.00 | 1,100.00 |
| 3 | 3" Water Pipe, furnishing & laying | 50 | LF | 3.00 | 150.00 |
| 4 | 20" Steel Cover Pipe, Bore & Jack | 50 | LF | 75.00 | 3,750.00 |
| 5 | 12" Gate Valve & Box | 3 | EA | 1,000.00 | 3,000.00 |
| 6 | 10" Gate Valve & Box | 5 | EA | 800.00 | 4,000.00 |
| 7 | 3" Gate Valve & Box | 2 | EA | 450.00 | 900.00 |
| 8 | Fire Hydrant Assembly | 2 | EA | 2,000.00 | 4,000.00 |
| 9 | PRV for Individual Service (All Sizes) | 100 | EA | 150.00 | 15,000.00 |
| 10 | Bituminous Paving Replacement (non-state) | 150 | LF | 15.00 | 2,250.00 |
| 11 | Crushed Stone on Trench Surface | 500 | LF | 5.00 | 2,500.00 |
| 12 | Concrete Replacement (Paving) | 25 | LF | 25.00 | 625.00 |
| 13 | Concrete Replacement (Sidewalk) | 100 | LF | 15.00 | 1,500.00 |
| 14 | Misc. Taps to Existing Main (All Sizes) | 5 | EA | 1,000.00 | 5,000.00 |
| 15 | 1 MG Elevated Water Tank | | LS | | 700,000.00 |
| 16 | Booster Pump Station | | LS | | 60,000.00 |
| 17 | Controls (Radio Telemetry) | | LS | | 25,000.00 |
| 18 | Pressure Reducing Valve & Vault (F/Mains) (Groggins Ferry) | | LS | | 5,000.00 |
| 19 | Electrically Operated Butterfly Valve & Vault (At Superior Datsun) | | LS | | 15,000.00 |
| 20 | Check Valve & Vault (Computrex Line) | | LS | | 10,000.00 |
| TOTAL ESTIMATED CONSTRUCTION COST | | | | | \$894,775.00 |
| | | | | | Say \$895,000.00 |

TABLE 2

ESTIMATED PROJECT COST - BASE PROJECT

| | |
|---|-----------------------|
| Construction Cost | \$895,000.00 |
| Engineering Fees | 109,000.00 |
| Resident Inspection Fee | 43,000.00 |
| Legal and Administrative Costs | 20,000.00 |
| Contingencies and Miscellaneous Costs | 90,000.00 |
| Land and/or Rights | 15,000.00 |
| Interest During Construction | 20,000.00 |
| Other Costs (Archaeological Survey/Miscellaneous Costs) | <u>2,000.00</u> |
| TOTAL ESTIMATED PROJECT COST | \$1,194,000.00 |

VI. FUNDING

Proposed funding for this project is being made available by the following:

TABLE 3

PROPOSED PROJECT FUNDING

| | |
|-------------------------|----------------|
| Tap Fees ⁽¹⁾ | \$0.00 |
| RD Loan ⁽²⁾ | \$1,194,000.00 |
| RD Grant | <u>\$0.00</u> |
| Total Project Funding | \$1,194,000.00 |

Note:

- (1) There are no new customers in the project.
- (2) 5.5% Loan for 40 years with principal deferred for 2 years.

VII. CUSTOMER ANALYSIS

A. History of Customer Growth

The JCWD #1 has experienced a steady growth of users over the last several years. The District's service area was primarily agricultural; however, over the last 10 years the customer demographics has changed to urban with many multi-users on a single connection, such as trailer parks, apartments, etc. Current zoning regulations permit the opportunity for commercial development in the area. Thus, development both residential and commercial, has increased in the District's service area.

There has been steady growth in the number of connections over the last 5 years.

See Table 4 for a history of that growth.

TABLE 4

CUSTOMER ANALYSIS

| <u>Year</u> | <u># Connections⁽¹⁾</u> | <u>% Growth</u> |
|------------------------------|------------------------------------|-----------------|
| 1992 | 612 | 0.00 |
| 1993 | 633 | 3.43 |
| 1994 | 656 | 3.63 |
| 1995 | 694 | 5.79 |
| 1996 | 730 ⁽²⁾ | <u>5.19</u> |
| Average Growth for 4 years = | | 4.51% |

Notes:

- (1) -Each connection is a single meter; however, many meters have multiple users such as apartments, trailer parks, etc.
 -These connections represent meter sizes of : 5/8 x 3/4, 1", 1-1/2" & 2".
 -Multiple users on each connection gets a monthly water bill per user not per connection.
- (2) 730 connections for 1996 represent approximately 1123 individual customers.

B. Projections of Customer Growth through 1998

From Table 4, the average annual growth has been 4.51%. It was decided to use 5% annual growth for this report. This is due to the number of requests that have been received by the District over the last several months.

There are currently 52± platted townhouses under construction in the Sutherland's Development @ US 27 & US 27 By-Pass; they were not counted in annual growth percent of 5%, but superimposed on that 5%. This was done because they are currently under construction and some are about ready for water service.

Estimated Connections for 1998:

$$\begin{aligned}
 \# \text{ of Connections} &= [730 + (730 \times 5\% \times 2 \text{ years})]^{(1)} + 52^{(2)} \\
 &= 803 + 52 \\
 &= 855 \text{ connections}^{(3)}
 \end{aligned}$$

Notes:

- (1) 2 years growth for 1997 & 1998.
- (2) 52 connections are for Sutherland's Development.

- (3) Assumed each growth connection to be single meter, average residential/commercial user. Therefore, growth = 125 connections/customers (855 connections or 1248 customers).

VIII. RATE ANALYSIS

A. Expenses

1. General

There are normally three components to be considered in calculating a system's total expenses. They are Operation & Maintenance Costs (O&M), Annual Debt Service (payment for principal and interest on the bonded indebtedness) and Coverage (monthly "set aside" from revenues to insure payment of Debt Service in "lean" times).

2. Operation and Maintenance Costs

(a) Purchased Water Expense

In 1996, the Water District spent \$179,695 to purchase water from the City. From the 1996 User Analysis (see Pages 5 & 5A of the attached Summary Addendum), the average monthly usage was 4,568 gallons per customer.

To obtain an estimation of water to be purchased from the City, projected through 1998 using the estimated number of growth customers projected through 1998, a basic assumption was made: we assumed the growth customers would use at the same rate of 4,568 gallons per month similar to the District's current average usage; we also assumed the 1996 unaccounted for water would stay approximately the same.

TABLE 5

ESTIMATED PURCHASED WATER - THROUGH 1998

| | |
|---|-----------------|
| Cost to existing customers (based on 1996)= | \$179,695 |
| Cost to growth customers = 125 customers x 4568 x \$1.85/1000 x 12 months = | <u>\$12,676</u> |
| Total Cost for 1998 | \$192,371 |
| | Say \$192,400 |

(b). Other Operating Expenses (Excluding Water Purchase)

TABLE 6

OTHER OPERATING EXPENSES - THROUGH 1998

| | Total Expenses from Audits | | | | Existing System | Proposed Project |
|---------------------------------|----------------------------|----------------|----------------|----------------|-----------------|-----------------------|
| | 1993 | 1994 | 1995 | 1996 | 1998 | 1998 |
| Engineer | \$1,142 | \$0 | \$6,096 | \$13,747 | 5,000 | 0 |
| EPA Monitoring | 9,275 | 9,204 | 12,285 | 9,079 | 9,200 | 600 |
| Customer Bookkeeping | 10,869 | 11,184 | 11,615 | 12,471 | 13,700 | 0 |
| General Bookkeeping | 11,904 | 11,803 | 12,574 | 13,119 | 14,000 | 0 |
| Professional Fees | 3,441 | 4,100 | 3,685 | 3,744 | 3,900 | 0 |
| Commissioner's Salary | 8,400 | 8,400 | 8,167 | 8,400 | 8,400 | 0 |
| Maintenance & Repairs | 11,009 | 18,597 | 28,272 | 27,498 | 28,000 | 1,200 |
| Meter Reading | 7,438 | 7,799 | 9,527 | 12,820 | 9,000 | 0 |
| Meter/Pressure Testing | 1,175 | 515 | 0 | 0 | 4,000 | 0 |
| Office Supplies & Miscellaneous | 4,930 | 6,035 | 12,837 | 12,317 | 6,000 | 0 |
| Rent | 3,600 | 3,600 | 4,600 | 4,800 | 5,000 | 0 |
| Utilities & Telephone | 3,801 | 3,840 | 4,105 | 4,470 | 5,000 | 3,600 |
| Insurance | 3,368 | 3,580 | 3,961 | 4,385 | 4,500 | 1,200 |
| Bad Debts | 1,608 | 85 | 128 | 260 | 300 | 0 |
| Transfers | 0 | 0 | 0 | 0 | 0 | 0 |
| Depreciation | 31,770 | 32,064 | 32,666 | 34,023 | 35,600 | 29,900 ⁽¹⁾ |
| Total Other Expenses | 113,730 | 120,806 | 150,518 | 161,133 | 151,600 | 36,500 |

Note:

(1) Depreciation = $\frac{\text{Project Cost}}{40 \text{ years}}$

3. Debt Service

(a) General

The annual debt service (payment for principal and interest) is established in the bond ordinance for each bond issue. The actual payment is dependent on the interest rate and term of the bond issue.

(b) Existing System

In 1998, the existing bond issues (1966 & 1987) have a combined principal payment of \$7,500 and a combined interest payment for \$26,300, for a Total Amount Debt Repayment of \$33,800. A detailed itemization of P& I payments for each existing bond issue can be found in the District's Annual Audit.

(c) Proposed Elevated Water Tank Project

The proposed bond issue for the Proposed Project is assumed to be a 100% RD loan at 5.5% interest rate for a term of 40 years with principal payments deferred for the first two years. For these conditions, the amortization factor used in calculating annual payments for P & I of the proposed project is \$63.28/1,000. Since the bond issue for the Proposed Project is \$1,194,000, the annual P & I payment shall be approximately \$75,600.

4. Coverage

Coverage is RD's requirement of establishing a monthly "set aside" to ensure payment of debt service should the utility have a "lean" year or some major unexpected cost. This money is a percent of the monthly revenues with a pre-

established "cap". It is normally placed in a reserve account and is not available to the Utility for O&M Expenses without RD's approval.

The normal percent used by RD for this item is 10% on each bond issue. That was the percent that was used in the following rate analysis for the Jessamine County Water District #1.

5. Summary of Expenses

The following table summarizes the estimated expenses to be incurred, by the JCWD #1, through 1998 (the projected first year of operation).

TABLE 7

SUMMARY OF EXPENSES - THROUGH 1998

| | <u>Annual Water Purchase</u> | <u>Annual O&M Expense</u> | <u>Debt Service</u> | <u>Coverage @ 10%</u> | <u>Total</u> |
|-----------------------|----------------------------------|-----------------------------------|-------------------------|---------------------------|------------------|
| Existing System | \$192,400 | \$151,600 | \$33,800 | \$3,400 | \$381,200 |
| Proposed Tank Project | <u>\$0</u> | <u>\$36,500</u> | <u>\$75,600</u> | <u>\$7,600</u> | <u>\$119,700</u> |
| Total | \$192,400 | \$188,100 | \$109,400 | \$11,000 | \$500,900 |

Therefore, the Water District needs to collect a minimum of \$500,900 annually to break even. Any amount in excess of that figure is surplus and can be used to make additional capital improvements to the water system and/or make repairs to the existing system.

B. Income Required

1. General

Income for a Utility comes from several sources; they are: sale of water, interest income on investments, fees received from disconnect/reconnect/late charges and surcharges. Surcharges are a relatively new method of fee collection in the water utility industry. The surcharge is an attempt to extend service into new areas by letting those that receive the service pay a more proportionate share of the cost. It also is an attempt at not making the first customers in a utility continually pay for expansion of that system.

The JCWD #1 has not previously used this surcharge method of income collection; nor will they utilize this method for this project since all of the existing customers will benefit from the new tank.

It should be noted that utility system growth is not bad for existing customers (i.e., the first customers in the system). If utility systems do not expand, grow and find new customers, then the first customers in the system shall find themselves paying higher utility bills anyway. This is because there is a fixed customer base (i.e., no growth/expansion) while expenses continue to rise (i.e., salaries, fuel, chemicals, etc.). Also, there are a certain amount of fixed costs, not related to growth and expansion, that continues to grow. Such expenses are office salaries, etc.

Thus, growth is good for all, even the first customers in the system, because it allows the Utility to spread its expenses over an ever growing number of customers.

It also allows the Utility to be in a position to "pickup" growth customers (i.e., those that move into the area and/or build after expansion projects are long completed).

2. Customers and Average Usage

The customer count and the annual usage was tabulated from data prepared by the JCWD #1. This usage is in the attached Summary Addendum on Pages 5 & 5A.

3. Revenue

Table 8 presents both the historical revenue; as well as, the projected revenue for 1998.

The District has 4 rate structures, one for each meter size (i.e., 5/8" x 3/4", 1", 1-1/2" & 2"). The only difference is the minimum for each meter size. See Pages 4A & 4B of the attached Summary Addendum for the existing rate structures.

TABLE 8
ESTIMATED REVENUE - THROUGH 1998

| | TOTAL REVENUE FROM AUDITS | | | | EXISTING SYSTEM | PROPOSED PROJECT |
|--------------------------|---------------------------|----------------|------------------|------------------|--------------------------|------------------|
| | 1993 | 1994 | 1995 | 1996 | 1998 ⁽¹⁾ | 1998 |
| Water Sales | \$283,714 | \$297,216 | \$333,648 | \$381,470 | \$411,900 ⁽²⁾ | \$0 |
| Interest & Miscellaneous | \$7,493 | 8,280 | \$10,212 | \$9,911 | \$1,000 ⁽³⁾ | \$0 |
| Penalties | \$4,547 | 5,601 | \$5,466 | \$5,883 | \$5,000 | \$0 |
| Service Charge | \$2,710 | 2,370 | \$2,515 | \$2,127 | \$2,000 | \$0 |
| Transfers | \$0 | 0 | \$0 | \$0 | \$0 | \$0 |
| Total Receipts | \$298,464 | 313,467 | \$351,841 | \$399,391 | \$419,900 | \$0 |

Notes:

- (1) Used system growth of 5% per year for 2 years plus an additional 52 customers due to Sutherland's Development; total connections in 1998 = $855 \pm$ (or 125 connections/customers). See Section VII, this report.
- (2) Income based on existing rates plus 125 new growth customers using average 4568 gal/month; plus 1996 Income.

1998 Income

| | | |
|---|---|-----------------|
| 1996 Income (Existing Customers/ Existing Rates) | = | \$381,470 |
| Growth Income (125 customers x 12 months x \$20.28/mo.) | = | <u>\$30,420</u> |
| Total | | \$411,890 |
| | | Say \$411,900 |

- (3) Interest income decreased due to District making capital improvements and using its savings.

4. Income from Existing Rates

As can be seen from Table 8, the existing system, using the existing rates, could generate income of approximately \$411,900 through 1998. This assumes growth in customers as previously discussed. Further, it assumes no tank project.

Comparing this projected income of \$411,900 to Table 7 of this report, it can be seen that a rate increase is not required if a new tank project is not undertaken. However, if the Tank Project is completed, the existing rate structure would not generate sufficient funds to meet all obligations; in fact, there would be an \$89,000 deficit (i.e., \$411,900 Income Less \$500,900 Expenses = \$89,000 deficit). Therefore, a rate increase is required.

5. Income From Proposed Rates

The proposed rate structures are presented on Pages 8 & 8A of the attached Summary Addendum. When applying the proposed rates to the customer count/usage brackets (see pages 9 & 9A of the attached Summary Addendum), the projected income from water sales is \$508,700 (see pages 10 & 10A of the attached Summary Addendum).

A summary of the proposed income generated is presented in Table 9.

TABLE 9

PROPOSED GENERATED INCOME - THROUGH 1998

| | |
|-----------------------|---------------------------------|
| Water Sales | \$508,700 |
| Interest Income | \$1,000 |
| Penalties | \$5,000 |
| Service Charges | <u>\$2,000</u> |
| Total Income | \$516,700 |
| Total Income Required | <u>\$500,900</u> ⁽¹⁾ |
| Surplus (Deficit) | \$15,800 |

Note:

(1) See Table 7, this report.

IX. RECOMMENDATIONS

It is recommended that the project be funded by a Rural Development Loan and a Letter of Conditions be issued as soon as possible.

Further, it appears that a rate increase shall be required.

Based on the above calculations, the proposed rates, along with the assumptions made, RD should allow the Water District to construct the Proposed Project. It appears they can meet all current and proposed debts and expenses, and still have a surplus of funds.

WATERJESSAMINE.RPT

APPENDIX - RD SUMMARY/ADDENDUM

SUMMARY/ADDENDUM

TO

PRELIMINARY ENGINEERING REPORT

Dated April, 1997

FOR

Jessamine County Water District #1

(Name of Water Facility Project)

Applicant Contact Person Eleanor Blakeman (Manager)
(606) 885-9314
Applicant Phone Number Carl Waits (Chairman)
(606) 887-5754 (H)

In order to avoid unnecessary delays in application processing, the applicant and its consulting engineer should prepare a summary of the preliminary engineering report in accordance with this Guide. Feasibility review and grant determinations may be processed more accurately and more rapidly if the Summary/Addendum is submitted simultaneously with the preliminary engineering report, or as soon thereafter as possible.

I. General

A. Area to be Served: In addition to this summary, the applicant/engineer should submit a project map of the service area showing the following:

1. Existing Facilities - Location and Size.
2. Proposed Facilities - Location and Size.
3. New User Location - Also attach a list of new users, by road.
N/A
4. Breakdown of project cost for each branch line.

II. FACILITY CHARACTERISTICS OF EXISTING WATER SYSTEM

A. Water Source: Describe adequacy of source (quality and quantity). Include an explanation of raw water source, raw water intake structure, treatment plant capacity, and current level of production (WTP). Also describe the adequacy of Water Purchase Contract if applicable.

Water is purchased from the City of Nicholasville, who
gets their water from the Ky. River. The source is adequate
and should continue to meet the needs of the District.

If the applicant purchases water:

Seller(s): City of Nicholasville

Price/1,000 gallons: \$1.81 plus monthly service
charge, ranging from \$31.80 to \$42.75 per month.
Present Estimated Market Value of Existing
System: \$ Unknown

B. Water Storage:

Type: Ground Storage Tank 0 Elevated Tank 1
Standpipe 0 Other

Number of Storage Structures 1

Total Storage Volume Capacity 250,000 gallons

Date Storage Tank(s) Constructed 1987

C. Water Distribution System:

Pipe Material PVC, DI & Transite *

Lineal Feet of Pipe: 3" Diameter 63,700' 4" Unknown
6" 13,000' 8" 17,700' 10" 5,300' 12" 100'

Date(s) Water Lines Constructed 1967 to present

Number and Capacity of Pump Station(s) _____
1-250 gpm

* All of the transite should be replaced by 6/97.

D. Condition of Existing Water System:

Briefly describe the condition and suitability for continued use of facility now owned by the applicant. Include any major renovation that will be needed within five to ten years.

The system is well run and well managed. Maintenance is carried out on a regular basis. When possible, the Commissioners have upgraded their system by paying the "betterment" costs in conjunction with KY DOT construction projects.

III. EXISTING LONG-TERM INDEBTEDNESS

A. List of Bonds and Notes:

| <u>Date of Issue</u> | <u>Principal Balance</u> | <u>Principal Payment</u> | <u>Pymt Date</u> | <u>Bond/Note Holder</u> | <u>Amount on Deposit in Reserve Acct</u> |
|----------------------|--------------------------|--------------------------|------------------|-------------------------|--|
| 19 <u>66</u> Issue | \$ <u>52,000</u> | \$ <u>5,000</u> | <u>Jan. 1</u> | <u>FmHA</u> | _____ |
| 19 <u>87</u> Issue | \$ <u>375,500</u> | \$ <u>2,500</u> | <u>Jan. 1</u> | <u>FmHA</u> | <u>\$50,762</u> ⁽¹⁾ |
| 19__ Issue | \$ _____ | \$ _____ | _____ | _____ | _____ |
| 19__ Issue | \$ _____ | \$ _____ | _____ | _____ | _____ |
| 19__ Issue | \$ _____ | \$ _____ | _____ | _____ | _____ |
| 19__ Issue | \$ _____ | \$ _____ | _____ | _____ | _____ |

IV. LAND AND RIGHTS - EXISTING SYSTEM(S)

| | |
|---------------------------------|---------------------|
| Number of Treatment Plant Sites | <u>0</u> |
| Number of Storage Tank Sites | <u>1</u> |
| Number of Pump Stations | <u>1</u> |
| Total Acreage | <u>1 < Acres</u> |
| Purchase Price | <u>\$ 0</u> |

Notes:

(1) Information taken from Audit period ending 12/31/95.

V. NUMBER OF EXISTING USERS

A. Water Users:

| | |
|---|--------------------------|
| Residential Size Meters (In Town)* | <u>730 Connections =</u> |
| Residential Size Meters/Farmers (Out of Town)* | <u>1123± Customers</u> |
| Larger Users (Larger Than 5/8" Meter (In Town)) | <u>in sizes 5/8"-2"</u> |
| Larger Users (Larger Than 5/8" Meter (Out of Town)) | _____ |
| Total | _____ |
| Number of Total Potential Users Living in the Service Area | <u>1200±</u> |

*NOTE: Residential/Farmers Users: Classify by type of user regardless of quantity of water used. This classification should include those meters serving individual rural residence size meters and farmers.

VI. CURRENT CONNECTION FEES FOR EACH SIZE METER CONNECTION

| <u>Meter Size</u> | <u>Connection Fee</u> | <u>Minimum Water Usage for Each Size Meter</u> |
|--------------------|-----------------------|--|
| <u>5/8" x 3/4"</u> | <u>\$ 400</u> | <u>3,000 gallons</u> |
| <u>1-Inch</u> | <u>\$ 605</u> | <u>5,000 gallons</u> |
| <u>1-1/2" Inch</u> | <u>\$ 900</u> | <u>10,000 gallons</u> |
| <u>2-Inch</u> | <u>\$ 1,170</u> | <u>20,000 gallons</u> |
| <u>3-Inch</u> | <u>\$ _____</u> | <u>_____ gallons</u> |
| <u>4-Inch</u> | <u>\$ _____</u> | <u>_____ gallons</u> |
| <u>5-Inch</u> | <u>\$ _____</u> | <u>_____ gallons</u> |
| <u>6-Inch</u> | <u>\$ _____</u> | <u>_____ gallons</u> |

VII. WATER RATES - EXISTING RATE SCHEDULE

Date this rate went into effect: June, 1995

Meter Size 5/8" x 3/4":

| | | | | |
|----------|---------------|--------------|--------------|--------------------|
| First | <u>3,000</u> | Gallons @ \$ | <u>15.33</u> | Minimum. |
| Next | <u>7,000</u> | Gallons @ \$ | <u>3.16</u> | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>2.86</u> | per 1,000 Gallons. |

Meter Size 1":

| | | | | |
|----------|---------------|--------------|--------------|--------------------|
| First | <u>5,000</u> | Gallons @ \$ | <u>21.65</u> | Minimum. |
| Next | <u>5,000</u> | Gallons @ \$ | <u>3.16</u> | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>2.86</u> | per 1,000 Gallons. |

Meter Size 1 1/2":

| | | | | |
|----------|---------------|--------------|--------------|--------------------|
| First | <u>10,000</u> | Gallons @ \$ | <u>37.45</u> | Minimum. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| Next | _____ | Gallons @ \$ | _____ | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>2.86</u> | per 1,000 Gallons. |

VII. Existing Rate Schedule (Continued)

Meter Size 2":

| | | | |
|----------|-------------------|--------------------------------|--------------------|
| First | <u>20,000</u> | Gallons @ \$ <u>66.05</u> | Minimum. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| All Over | <u>20,000</u> | Gallons @ \$ <u>2.86</u> | per 1,000 Gallons. |

Meter Size :

| | | | |
|----------|-------------------|--------------------------------|--------------------|
| First | <u> </u> | Gallons @ \$ <u> </u> | Minimum. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| All Over | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |

Note:

The rate brackets are the same for all meter sizes except minimums are different (ie, the minimum increases as meter size increases.)

VIII. ANALYSIS OF ACTUAL WATER USAGE - EXISTING SYSTEM - 12 MONTH PERIOD ⁽¹⁾

For Period January, 1996 to December, 1996

| Meter Size | MONTHLY WATER USAGE | | Average | Residential/ Farmer | | Non-Residential/ Commercial | |
|------------------------|---------------------|------|---------------|------------------------|--------------|---|--------------|
| | | | | No. of Users | Usage (1000) | No. of Users | Usage (1000) |
| | 0 - 3,000 | Gal. | 1,500 | 386 | 500 | | |
| | 3,000 - 4,000 | Gal. | 3,500 | 113 | 464 | | |
| | 4,000 - 5,000 | Gal. | 4,500 | 218 | 887 | | |
| | 5,000 - 6,000 | Gal. | 5,500 | 135 | 741 | | |
| 5/8 x | 6,000 - 7,000 | Gal. | 6,500 | 47 | 310 | | |
| | 7,000 - 8,000 | Gal. | 7,500 | 40 | 295 | | |
| 3/4 | 8,000 - 9,000 | Gal. | 8,500 | 30 | 255 | | |
| | 9,000 - 10,000 | Gal. | 9,500 | 28 | 265 | | |
| Inch | 10,000 - 11,000 | Gal. | 10,500 | 31 | 340 | | |
| | 11,000 - 12,000 | Gal. | 11,500 | 19 | 212.5 | | |
| to | 12,000 - 13,000 | Gal. | 12,500 | 9 | 111 | | |
| | 13,000 - 14,000 | Gal. | 13,500 | 5 | 68 | | |
| 1 1/2 | 14,000 - 15,000 | Gal. | 14,500 | 2 | 28 | | |
| | 15,000 - 16,000 | Gal. | 15,500 | 4 | 62 | | |
| Inch | 16,000 - 17,000 | Gal. | 16,500 | 5 | 86.5 | | |
| | 17,000 - 18,000 | Gal. | 17,500 | 2 | 35 | | |
| | 18,000 - 19,000 | Gal. | 18,500 | 1 | 19 | | |
| | 19,000 - 20,000 | Gal. | 19,500 | 1 | 19 | | |
| | 20,000 - 30,000 | Gal. | 25,000 | 11 | 261.5 | | |
| | - | Gal. | - | - | - | | |
| | - | Gal. | - | - | - | | |
| | | | Sub-Total | (1087) | (4965.5) | () | () |
| | | | Average Usage | | (4508) | | () |
| 1-Inch to 2 Inch | 30-50,000 | Gal. | 30,000 | 2 | 60 | | |
| | 50-100,000 | Gal. | 75,000 | 7 | 515 | | |
| | 100-250,000 | Gal. | 175,000 | 5 | 742 | | |
| | 250-500,000 | Gal. | 375,000 | 2 | 777 | | |
| | | | Sub-Total | (16) | (2094) | () | () |
| 1" 1 1/2" | 5,000 (min) | Gal. | 588 | 17 | 10 | } Fire Sprinkler meters Pay min. Monthly Bill | |
| | 10,000 (min) | Gal. | 667 | 3 | 2 | | |
| | | Gal. | | | | | |
| | | Gal. | | | | | |
| | | | Sub-Total | (20) | (12) | () | () |

Notes:

(1) Numbers and Averages based on 2 months data; used August & December, 1996.

Continued

VIII. continued

| Meter Size | MONTHLY WATER USAGE | | Average | Residential/ Farmer | | Non-Residential/ Commercial | |
|-------------------------------|---------------------|------------|---------|----------------------------------|---------------------------|--------------------------------|--------------|
| | | | | No. of Users | Usage (1000) | No. of Users | Usage (1000) |
| 2-Inch | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | | Sub-Total | | () () | () () | () () | |
| 3-Inch | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | | Sub-Total | | () () | () () | () () | |
| 4-Inch | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | | Sub-Total | | () () | () () | () () | |
| 5-Inch | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | | Sub-Total | | () () | () () | () () | |
| 6-Inch | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | _____ | Gal. _____ | _____ | _____ | _____ | _____ | _____ |
| | | Sub-Total | | () () | () () | () () | |
| | | Total | | (1123) (7071.5 ⁽¹⁾) | () () | () () | |
| Total Water Purchased in 1996 | | | | | 99,033,650 | _____ | _____ |
| Total Water Sold in 1996 | | | | | 92,767,940 ⁽¹⁾ | _____ | _____ |

Notes:

(1) Difference in water sold (92.8Mgal) and water sold as predicted by this model (84.9Mgal) is due to the use of 2 months averages. $(7071,500 \times 12 \text{ mos} = 84,858,000 \text{ gal})$

IX. FACILITY CHARACTERISTICS OF PROPOSED WATER SYSTEM

A. Water Source: Describe adequacy of source (quality and quantity). Include an explanation of raw water source, raw water intake structure, treatment plant capacity, and current level of production (WTP). Also describe the adequacy of Water Purchase Contract if applicable.

This will not change with the new project; the District will
continue to purchase water from the City of Nicholasville.

B. Water Storage:

Type: Ground Storage Tank 0 Elevated Tank 1
Standpipe 0 Other 0

Number of Storage Structures 1

Total Storage Volume Capacity 1,000,000 gallons

C. Water Distribution System:

Pipe Material PVC

Lineal Feet of Pipe: 3" Diameter 50' 4" 6"
8" 10" 100' 12" 3000'

Number and Capacity of Pump Station(s)

1-Booster Pump Station @ 350-500 gpm

X. LAND AND RIGHTS - PROPOSED WATER SYSTEM(S)

Number of Treatment Plant Sites 0

Number of Pump Sites 1

Number of Other Sites (Storage Tank) 1

Total Acreage < 1 Acres

Purchase Price \$ 10,000-15,000

XI. NUMBER OF NEW USERS

A. Water Users:

| | |
|---|--------------|
| Residential Size Meters (In Town)* | <u>0</u> |
| Residential Size Meters/Farmers (Out of Town)* | <u>0</u> |
| Larger Users (Larger Than 5/8" Meter (In Town)) | <u>0</u> |
| Larger Users (Larger Than 5/8" Meter (Out of Town)) | <u>0</u> |
| Total | <u>0</u> |
| Number of Total Potential Users Living in the Service Area | <u>1200±</u> |

*NOTE: Residential/Farmers Users: Classify by type of user regardless of quantity of water used. This classification should include those meters serving individual rural residence size meter and farmers.

XII. PROPOSED CONNECTION FEES FOR EACH SIZE METER CONNECTION

| Meter Size | Connection Fee** | Minimum Water Usage for Each Size Meter |
|--------------------|------------------|--|
| <u>5/8" x 3/4"</u> | <u>\$ 400</u> | <u>3,000 gallons</u> |
| <u>1-Inch</u> | <u>\$ 605</u> | <u>5,000 gallons</u> |
| <u>1-1/2" Inch</u> | <u>\$ 900</u> | <u>10,000 gallons</u> |
| <u>2-Inch</u> | <u>\$ 1,170</u> | <u>20,000 gallons</u> |
| <u>3-Inch</u> | <u>\$</u> | <u>gallons</u> |
| <u>4-Inch</u> | <u>\$</u> | <u>gallons</u> |
| <u>5-Inch</u> | <u>\$</u> | <u>gallons</u> |
| <u>6-Inch</u> | <u>\$</u> | <u>gallons</u> |

**Current Connection Fees-will not change.

XIII. WATER RATES - PROPOSED

Meter Size 5/8" x 3/4" :

| | | | | |
|----------|-------------------|--------------|-------------------|--------------------|
| First | <u>3,000</u> | Gallons @ \$ | <u>18.00</u> | Minimum. |
| Next | <u>7,000</u> | Gallons @ \$ | <u>4.20</u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>4.10</u> | per 1,000 Gallons. |

Meter Size 1" :

| | | | | |
|----------|-------------------|--------------|-------------------|--------------------|
| First | <u>5,000</u> | Gallons @ \$ | <u>26.40</u> | Minimum. |
| Next | <u>5,000</u> | Gallons @ \$ | <u>4.20</u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>4.10</u> | per 1,000 Gallons. |

Meter Size 1 1/2" :

| | | | | |
|----------|-------------------|--------------|-------------------|--------------------|
| First | <u>10,000</u> | Gallons @ \$ | <u>47.40</u> | Minimum. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ | <u> </u> | per 1,000 Gallons. |
| All Over | <u>10,000</u> | Gallons @ \$ | <u>4.10</u> | per 1,000 Gallons. |

XIII. PROPOSED RATES;

(Continued);

Meter Size 2":

| | | | |
|----------|-------------------|--------------------------------|--------------------|
| First | <u>20,000</u> | Gallons @ \$ <u>88.40</u> | Minimum. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| All Over | <u>20,000</u> | Gallons @ \$ <u>4.10</u> | per 1,000 Gallons. |

Meter Size :

| | | | |
|----------|-------------------|--------------------------------|--------------------|
| First | <u> </u> | Gallons @ \$ <u> </u> | Minimum. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| Next | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |
| All Over | <u> </u> | Gallons @ \$ <u> </u> | per 1,000 Gallons. |

XIV. FORECAST OF WATER USAGE - INCOME - EXISTING SYSTEM - EXISTING USERS

| Meter size | MONTHLY WATER USAGE | Average | Average Rate | Residential/ Farmer | | Non-Residential/ Commercial | | | |
|------------|----------------------------|---------|--------------|------------------------|-------------|--------------------------------|--------------------------|-------------|--------|
| | | | | No. of Users | Usage 1,000 | Income | No. of Users | Usage 1,000 | Income |
| | 0 - 3,000 Gal. | 1,500 | \$15.33 | 386 | | \$5918 | | | |
| | 3,000 - 4,000 Gal. | 3,500 | 16.91 | 113 | | 1911 | | | |
| | 4,000 - 5,000 Gal. | 4,500 | 20.07 | 218 | | 4376 | | | |
| | 5,000 - 6,000 Gal. | 5,500 | 23.23 | 135 | | 3137 | | | |
| | 6,000 - 7,000 Gal. | 6,500 | 26.39 | 47 | | 1241 | | | |
| 5/8 x | 7,000 - 8,000 Gal. | 7,500 | 29.55 | 40 | | 1182 | | | |
| | 8,000 - 9,000 Gal. | 8,500 | 32.71 | 30 | | 982 | | | |
| 3/4 | 9,000 - 10,000 Gal. | 9,500 | 35.87 | 28 | | 1005 | | | |
| | 10,000 - 11,000 Gal. | 10,500 | 38.88 | 31 | | 1200 | | | |
| Inch | 11,000 - 12,000 Gal. | 11,500 | 41.74 | 19 | | 794 | | | |
| to | 12,000 - 13,000 Gal. | 12,500 | 44.60 | 9 | | 402 | | | |
| | 13,000 - 14,000 Gal. | 13,500 | 47.46 | 5 | | 232 | | | |
| 1/2 | 14,000 - 15,000 Gal. | 14,500 | 50.32 | 2 | | 101 | | | |
| | 15,000 - 16,000 Gal. | 15,500 | 53.18 | 4 | | 213 | | | |
| Inch | 16,000 - 17,000 Gal. | 16,500 | 56.04 | 5 | | 281 | | | |
| | 17,000 - 18,000 Gal. | 17,500 | 58.90 | 2 | | 112 | | | |
| | 18,000 - 19,000 Gal. | 18,500 | 61.76 | 1 | | 62 | | | |
| | 19,000 - 20,000 Gal. | 19,500 | 64.62 | 1 | | 65 | | | |
| | 20,000 - 30,000 Gal. | 25,000 | 50.35 | 11 | | 884 | | | |
| | - Gal. | | | | | | | | |
| | - Gal. | | | | | | | | |
| | Sub-Total..... | | | 11087 | | \$24106 | | | |
| | Average Monthly Rate..... | | | | | | | | |
| | Average Monthly Usage..... | | | | | | | | |
| | 30-50,000 Gal. | 30,000 | \$94.65 | 2 | | \$190 | | | |
| | 50-100,000 Gal. | 75,000 | 283.25 | 7 | | 1504 | | | |
| | 100-250,000 Gal. | 175,000 | 509.35 | 5 | | 2547 | | | |
| | 250-500,000 Gal. | 375,000 | 1081.35 | 2 | | 2163 | | | |
| | - Gal. | | | | | | | | |
| | - Gal. | | | | | | | | |
| | Sub-Total | | | 16 | | \$6404 | | | |
| 1" | 5000 (min) Gal. | 5,000 | \$21.65 | 17 | | \$369 | Fire/Sprinkler meters | | |
| 1 1/2" | 10,000 (min) Gal. | 10,000 | 37.45 | 3 | | 113 | | | |
| | - Gal. | | | | | | | | |
| | - Gal. | | | | | | | | |
| | - Gal. | | | | | | | | |
| | Sub-Total | | | 20 | | \$482 | | | |

Continued.....

Note:
(1) Used existing Rate Structure.

XIV. Continued.....

| Meter Size | MONTHLY WATER USAGE | Average | Average Rate | Residential/ Farmer | | | Non-Residential/ Commercial | | |
|-------------|---------------------|---------|--------------|------------------------|-------------|-------------|--------------------------------|-------------|--------|
| | | | | No. of Users | Usage 1,000 | Income | No. of Users | Usage 1,000 | Income |
| 2-Inch | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () |
| 3-Inch | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () |
| 4-Inch | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () |
| 5-Inch | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () |
| 6-Inch | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () |
| TOTALS..... | | | | 1123 | () | \$31,062(1) | () | () | () |

Notes:

- (1)-Annual Income from model=\$31,062 x 12 = \$372,744.
- Annual Income from 1996 Audit = \$381,470.
- % Difference = 2.3% (ie, model predicts income 2.3% ± lower than actual).
- (2) Existing rates, even with growth, cannot support the proposed project; a rate increase is required. (9A)

XV. FORECAST OF WATER USAGE - INCOME - Existing & Growth Users - Including Tank Project & New Rates (1)

| Meter Size | MONTHLY WATER USAGE | Average | Average Rate | Residential/ Farmer | | | Non-Residential/ Commercial | | |
|------------|----------------------------|---------------------|--------------|------------------------|-------------|---------|--------------------------------|-------------|--------|
| | | | | No. of Users | Usage 1,000 | Income | No. of Users | Usage 1,000 | Income |
| | 0 - 3,000 Gal. | 1,500 | \$ 18.00 | 386 | | \$6948 | | | |
| | 3,000 - 4,000 Gal. | 3,500 | 20.10 | 113 | | 2271 | | | |
| | 4,000 - 5,000 Gal. | 4,500 | 24.30 | 218 | | 5297 | | | |
| | 5,000 - 6,000 Gal. | 5,500 | 28.50 | 135 | | 3848 | | | |
| | 6,000 - 7,000 Gal. | 6,500 | 32.70 | 47 | | 1537 | | | |
| 3/8 x | 7,000 - 8,000 Gal. | 7,500 | 36.90 | 40 | | 1476 | | | |
| | 8,000 - 9,000 Gal. | 8,500 | 41.10 | 30 | | 1233 | | | |
| 3/4 | 9,000 - 10,000 Gal. | 9,500 | 45.30 | 28 | | 1268 | | | |
| | 10,000 - 11,000 Gal. | 10,500 | 49.45 | 31 | | 1533 | | | |
| Inch | 11,000 - 12,000 Gal. | 11,500 | 53.55 | 19 | | 1017 | | | |
| | 12,000 - 13,000 Gal. | 12,500 | 57.65 | 9 | | 519 | | | |
| to | 13,000 - 14,000 Gal. | 13,500 | 61.75 | 5 | | 309 | | | |
| | 14,000 - 15,000 Gal. | 14,500 | 65.85 | 2 | | 132 | | | |
| 1/2 | 15,000 - 16,000 Gal. | 15,500 | 69.95 | 4 | | 280 | | | |
| | 16,000 - 17,000 Gal. | 16,500 | 74.05 | 5 | | 370 | | | |
| | 17,000 - 18,000 Gal. | 17,500 | 78.15 | 2 | | 156 | | | |
| Inch | 18,000 - 19,000 Gal. | 18,500 | 82.25 | 1 | | 82 | | | |
| | 19,000 - 20,000 Gal. | 19,500 | 86.35 | 1 | | 86 | | | |
| | 20,000 - 30,000 Gal. | 25,000 | 108.90 | 11 | | 1198 | | | |
| | - Gal. | | | | | | | | |
| | - Gal. | | | | | | | | |
| | Growth Cust. ← | 4568 ⁽²⁾ | 24.59 | 125 | | 3074 | | | |
| | Sub-Total..... | | | (1212) | | (32634) | | | |
| | Average Monthly Rate..... | | | | | | | | |
| | Average Monthly Usage..... | | | | | | | | |
| | 30 - 50,000 Gal. | 30,000 | \$129.40 | 2 | | \$259 | | | |
| | 50 - 100,000 Gal. | 75,000 | 313.90 | 7 | | 2197 | | | |
| | 100 - 250,000 Gal. | 175,000 | 723.90 | 5 | | 3620 | | | |
| 1-Inch | 250 - 500,000 Gal. | 375,000 | 1543.90 | 2 | | 3088 | | | |
| to | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | (16) | | (9104) | | | |
| 2-Inch | | | | | | | | | |
| 1" | 5,000 (min) Gal. | 5,000 | \$26.48 | 17 | | \$449 | | | |
| 1 1/2" | 10,000 (min) Gal. | 10,000 | 47.40 | 3 | | 142 | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Gal. | | | | | | | | |
| | Sub-Total | | | (20) | | (391) | | | |

Continued.....

Notes:

- 1) No new users except those added by normal growth of system; Income based on Proposed Rate Structure. Growth customers = 125.
- 2) Represents 125 growth customers 1997 & 1998 using average established in model, see pg. 5 this Summary Addendum.

{ Fire/Sprinkler meters

XV. Continued.....

| Meter Size | MONTHLY WATER USAGE | Average | Average Rate | Residential/ Farmer | | | Non-Residential/ Commercial | | | |
|-------------|---------------------|---------|--------------|------------------------|-------------|--------|--------------------------------|-------------|--------|-----|
| | | | | No. of Users | Usage 1,000 | Income | No. of Users | Usage 1,000 | Income | |
| 2-Inch | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () | |
| 3-Inch | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () | |
| 4-Inch | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () | |
| 5-Inch | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () | |
| 6-Inch | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Gal. | | | | | | | | | |
| | Sub-Total | | | () | () | () | () | () | () | |
| TOTALS..... | | | | 1248 | () | () | 42389 | () | () | () |

Notes:

(1) Annual Income from water sales = \$42,389 x 12 = \$508,668
 use = \$508,700

XVI. CURRENT OPERATING BUDGET - (As of the last full operating year)

(1996 Audit)

A. Operating Income:

| | |
|---------------------------------------|-------------------|
| Water Sales | \$ 381,470 |
| Disconnect/Reconnect/Late Charge Fees | <u>8,010</u> |
| Other (Describe) | <u>0</u> |
| Less Allowances and Deductions | (<u>0</u>) |
| Total Operating Income..... | \$ <u>389,480</u> |

B. Operation and Maintenance Expenses:
(Based on Uniform System of Accounts prescribed by National Association of Regulatory Utility Commissioners)

| | |
|---------------------------------------|-------------------|
| Source of Supply Expense | \$ 179,695 |
| Pumping Expense | <u>127,110</u> |
| Water Treatment Expense | <u> </u> |
| Transmission and Distribution Expense | <u> </u> |
| Customer Accounts Expense | <u> </u> |
| Administrative and General Expense | <u> </u> |
| Depreciation | <u>34,023</u> |
| Total Operating Expenses..... | \$ <u>340,828</u> |
| Net Operating Income..... | \$ <u>48,652</u> |

C. Non-Operating Income:

| | |
|---------------------------------|-----------------|
| Interest on Deposits | \$ 9,911 |
| Other (Identify) | <u>0</u> |
| Total Non-Operating Income..... | \$ <u>9,911</u> |

D. Net Income..... \$ 58,563

E. Debt Repayment:

| | |
|----------------------|------------------|
| FmHA Interest | \$ 26,807 |
| FmHA Principal | <u>7,500</u> |
| Non-FmHA Interest | <u>0</u> |
| Non-FmHA Principal | <u>0</u> |
| Total Debt Repayment | \$ <u>34,307</u> |

F. Balance Available for Coverage \$ 24,256

XVII. PROPOSED OPERATING BUDGET - EXISTING & NEW USERS ⁽¹⁾
 (1st Full Year of Operation) Year Ending 1998

| | | |
|--|----|-------------------------------|
| A. Operating Income: | | (2) |
| Water Sales | \$ | 508,700 |
| Disconnect/Reconnect/Late Charge Fees | | <u>7,000</u> |
| Other (Describe) | | <u>0</u> |
| Less Allowances and Deductions | | (<u>0</u>) |
| Total Operating Income..... | \$ | <u>515,700</u> |
| B. Operation and Maintenance Expenses: | | |
| (Based on Uniform System of Accounts prescribed by National Association of Regulatory Utility Commissioners) | | |
| Source of Supply Expense | \$ | 192,400 ⁽³⁾ |
| Pumping Expense | | <u>116,000</u> |
| Water Treatment Expense | | <u> </u> |
| Transmission and Distribution Expense | | <u> </u> |
| Customer Accounts Expense | | <u> </u> |
| Administrative and General Expense | | <u> </u> |
| Depreciation | | <u>35,600</u> |
| Total Operating Expenses..... | \$ | <u>344,000</u> |
| Net Operating Income..... | \$ | <u>171,700</u> |
| C. Non-Operating Income: | | |
| Interest on Deposits | \$ | <u>1,000</u> |
| Other (Identify) | | <u>0</u> |
| Total Non-Operating Income..... | \$ | <u>1,000</u> |
| D. Net Income..... | \$ | <u>172,700</u> |
| E. Debt Repayment: | | |
| FmHA Interest | \$ | 26,300 |
| FmHA Principal | | <u>7,500</u> |
| Non-FmHA Interest | | <u>0</u> |
| Non-FmHA Principal | | <u>0</u> |
| Total Debt Repayment | \$ | <u>33,800</u> |
| F. Balance Available for Coverage and Depreciation.... | \$ | <u>138,900</u> ⁽⁴⁾ |

Notes:

- (1) New users are due to normal growth in system (ie, 125 customers); expenses etc. increased due to inflation, income reflects new rates. No expenses for new project are shown here - See pg. 13.
- (2) See income calculations from pgs. 10 & 10A.
- (3) Cost of water = 1996 costs + increase due 125 growth customers = \$179,695 + (125 x 4,568 gal/mo. x \$1.85/1000 x 12 mos.)
- (4) See pg. 13 for offsetting expenses (due to proposed project)

XVIII. PROPOSED OPERATING BUDGET - NEW TANK PROJECT-0 NEW USERS
 (1st Full Year of Operation) Year Ending 1993

| | |
|---|---------------------|
| A. Operating Income: | |
| Water Sales | \$ <u>0</u> |
| Disconnect/Reconnect/Late Charge Fees | <u>0</u> |
| Other (Describe) | <u>0</u> |
| Less Allowances and Deductions | (<u>0</u>) |
| Total Operating Income..... | \$ <u>0</u> |
| B. Operation and Maintenance Expenses: (Based on Uniform System of Accounts prescribed by National Association of Regulatory Utility Commissioners) | |
| Source of Supply Expense | \$ <u>0</u> |
| Pumping Expense | <u> </u> |
| Water Treatment Expense | <u> </u> |
| Transmission and Distribution Expense | <u>6,600</u> |
| Customer Accounts Expense | <u> </u> |
| Administrative and General Expense | <u> </u> |
| Depreciation | <u>29,900 (1)</u> |
| Total Operating Expenses..... | \$ <u>36,500</u> |
| Net Operating Income..... | \$ <u>(36,500)</u> |
| C. Non-Operating Income: | |
| Interest on Deposits | \$ <u>0</u> |
| Other (Identify) | <u>0</u> |
| Total Non-Operating Income..... | \$ <u>0</u> |
| D. Net Income..... | \$ <u>(36,500)</u> |
| E. Debt Repayment: | |
| FmHA Interest | \$ <u>75,600</u> |
| FmHA Principal | <u>-</u> |
| Non-FmHA Interest | <u>0</u> |
| Non-FmHA Principal | <u>0</u> |
| Total Debt Repayment | \$ <u>75,600</u> |
| F. Balance Available for Coverage | \$ <u>(112,100)</u> |

Notes:

(1) Depreciation = $\frac{\text{Project Costs}}{40 \text{ yrs.}}$

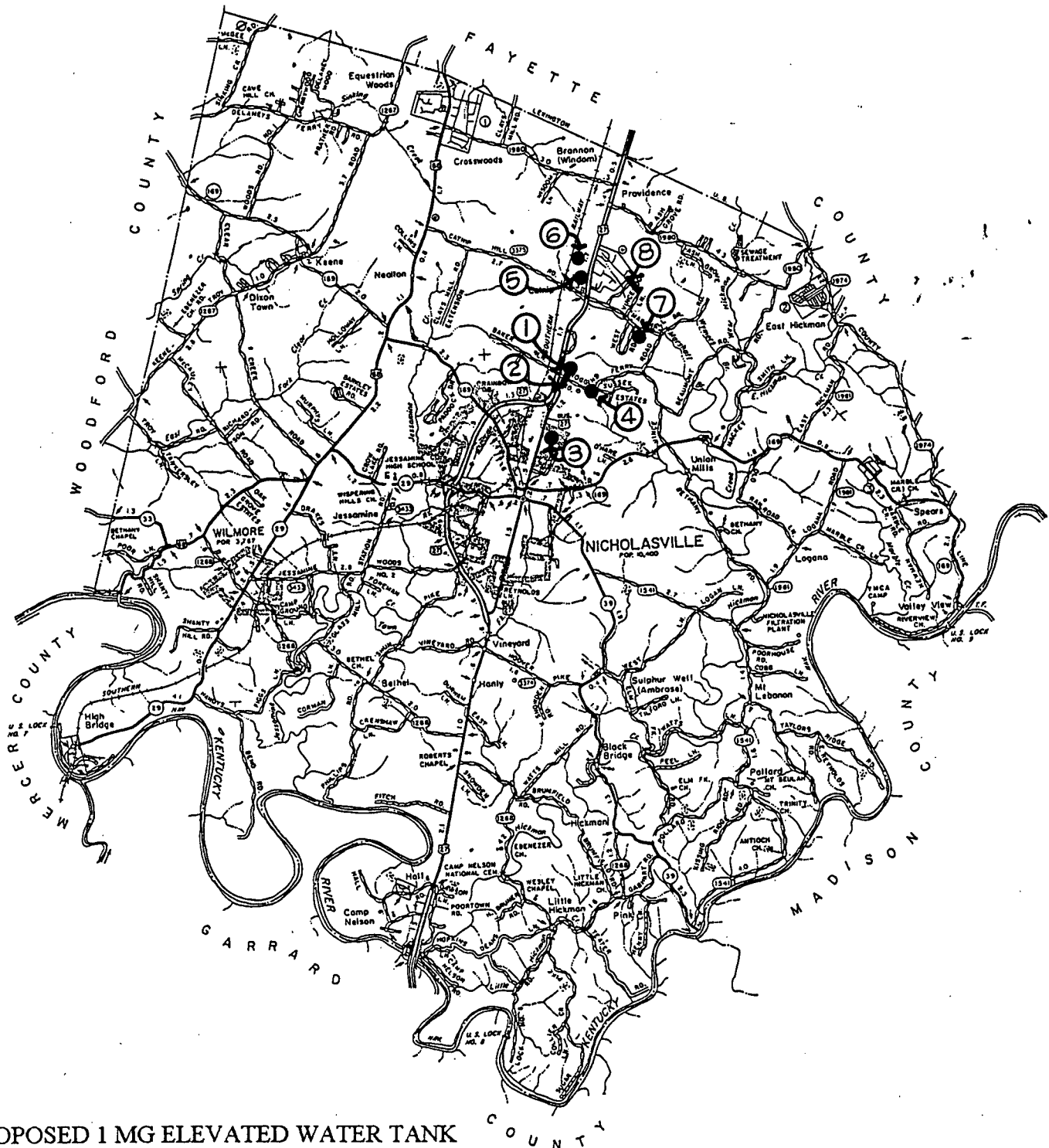
(2) P&I based on 100% Loan = \$1,194,000 @ 5 1/2% rate for 40 yrs.

XIX. ESTIMATED PROJECT COST - WATER

| | |
|---|------------------|
| Development | \$ 895,000 |
| Land and Rights | 15,000 |
| Legal & Administrative | 20,000 |
| Engineering & Inspection | 152,000 |
| Interest | 20,000 |
| Contingencies | 90,000 |
| Initial Operating and Maintenance | 0 |
| Other (Archaeological Survey & Misc. Costs) | 2,000 |
| TOTAL | <u>1,194,000</u> |

XX. PROPOSED PROJECT FUNDING

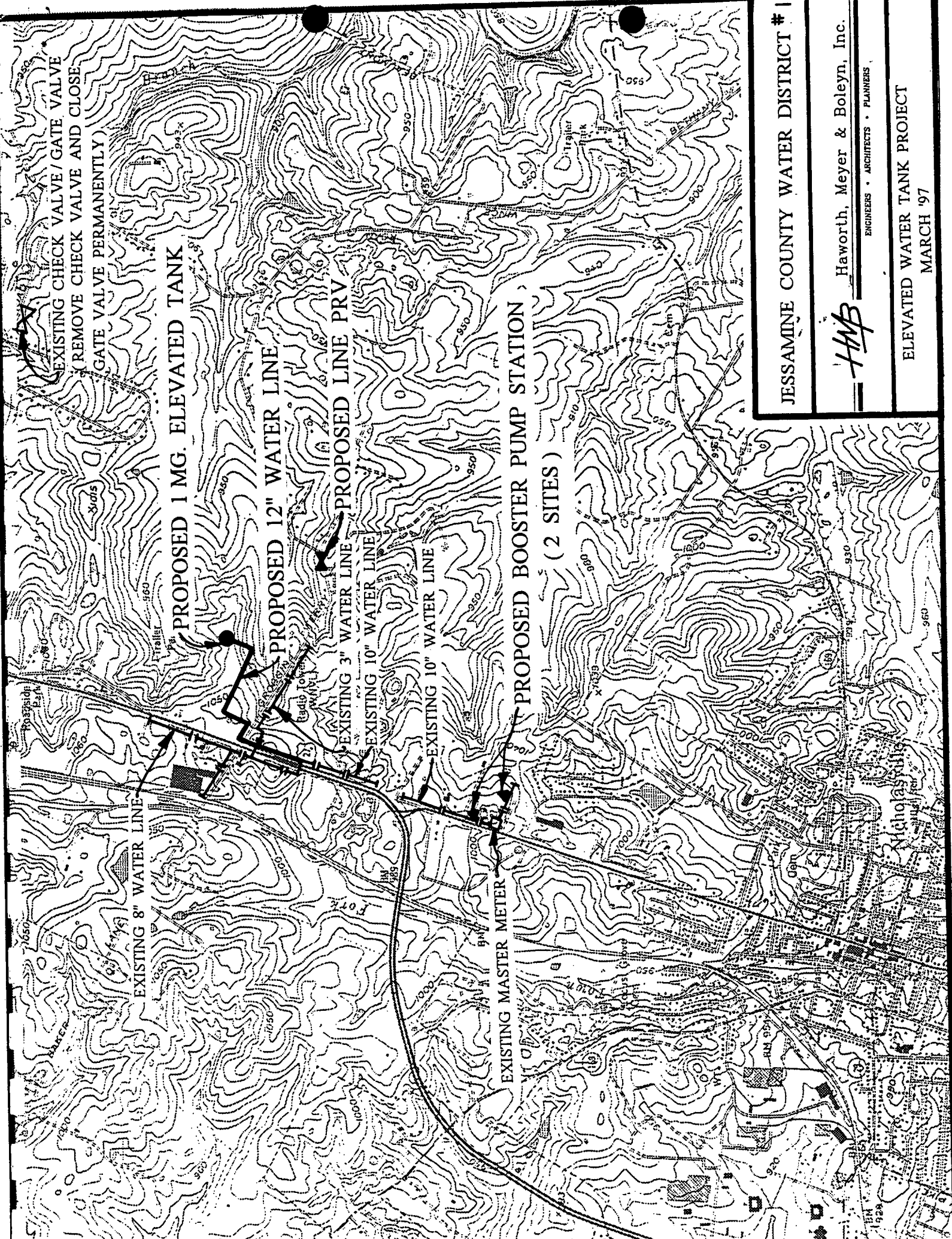
| | |
|----------------------------------|---------------------|
| Applicant - User Connection Fees | \$ 0 |
| Other Applicant Contribution | 0 |
| RD Loan | 1,194,000 |
| RD Grant | 0 |
| Other (Specify) | 0 |
| Other (Specify) | 0 |
| Other (Specify) | 0 |
| Other (Specify) | 0 |
| TOTAL | <u>\$ 1,194,000</u> |



- ① PROPOSED 1 MG ELEVATED WATER TANK
- ② 12" PVC WATER LINE
- ③ PROPOSED BOOSTER PUMP STATION
- ④ PROPOSED MAIN LINE PRV
- ⑤ PROPOSED ELECTRICALLY OPERATED BUTTERFLY VALVE & VAULT
- ⑥ CONVERT GATE VALVE TO CHECK VALVE & VAULT
- ⑦ CONVERT CHECK VALVE TO GATE VALVE

⑧ ADD-ON LINE

| | |
|---|--|
| JESSAMINE COUNTY WATER DISTRICT # 1 | |
| | Haworth, Meyer & Boleyn, Inc. <small>ENGINEERS • ARCHITECTS • PLANNERS</small> |
| ELEVATED WATER TANK PROJECT MARCH 1997 | |



EXISTING CHECK VALVE / GATE VALVE
 (REMOVE CHECK VALVE AND CLOSE
 GATE VALVE PERMANENTLY)

PROPOSED 1 MG. ELEVATED TANK

PROPOSED 12" WATER LINE

PROPOSED LINE PRV

EXISTING 3" WATER LINE

EXISTING 10" WATER LINE

EXISTING 10" WATER LINE

PROPOSED BOOSTER PUMP STATION

(2 SITES)

EXISTING MASTER METER

JESSAMINE COUNTY WATER DISTRICT # 1

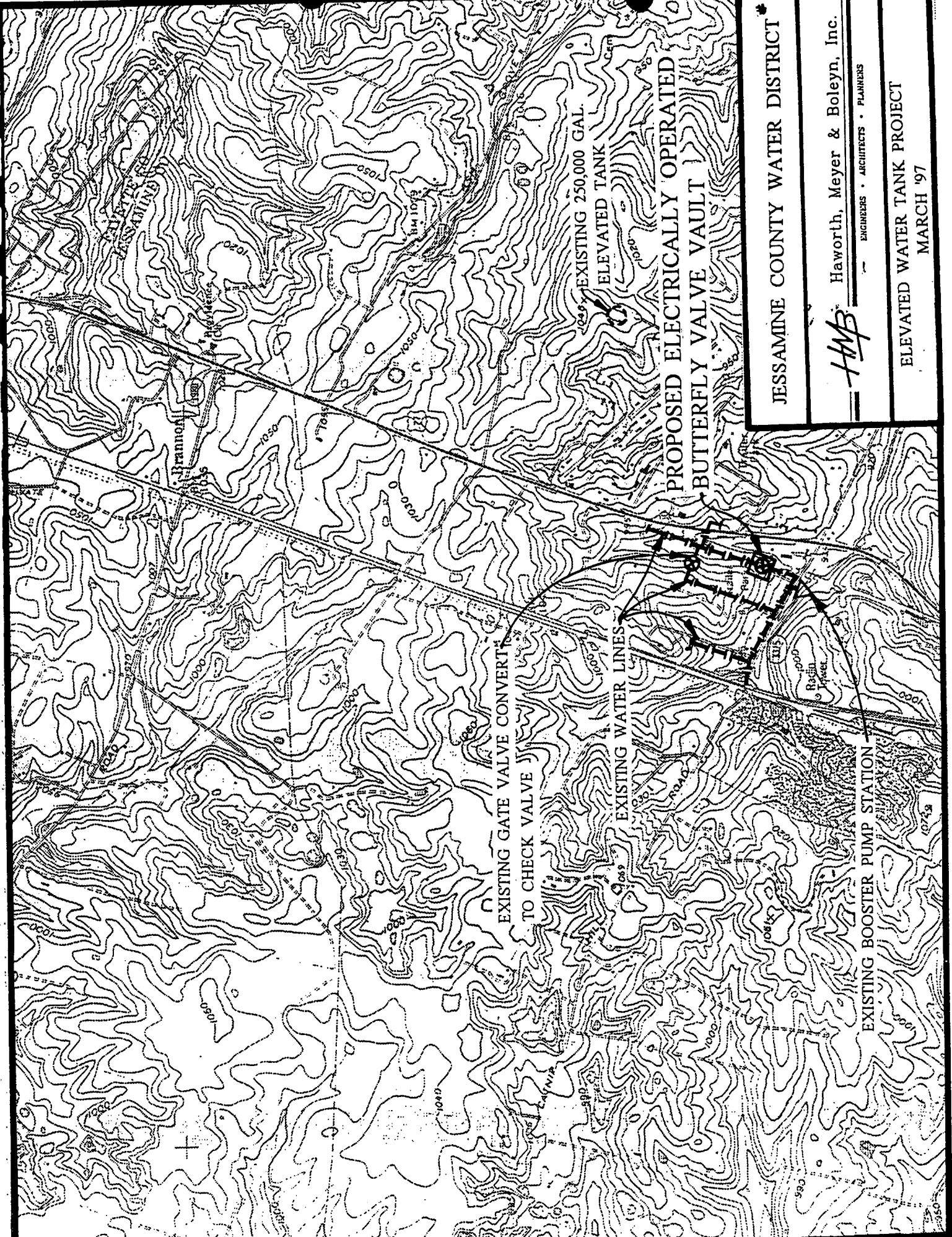
HMB

Haworth, Meyer & Boleyn, Inc.

ENGINEERS • ARCHITECTS • PLANNERS

ELEVATED WATER TANK PROJECT

MARCH '97



EXISTING GATE VALVE CONVERT
TO CHECK VALVE

EXISTING WATER LINES

EXISTING BOOSTER PUMP STATION

EXISTING 250,000 GAL.
ELEVATED TANK

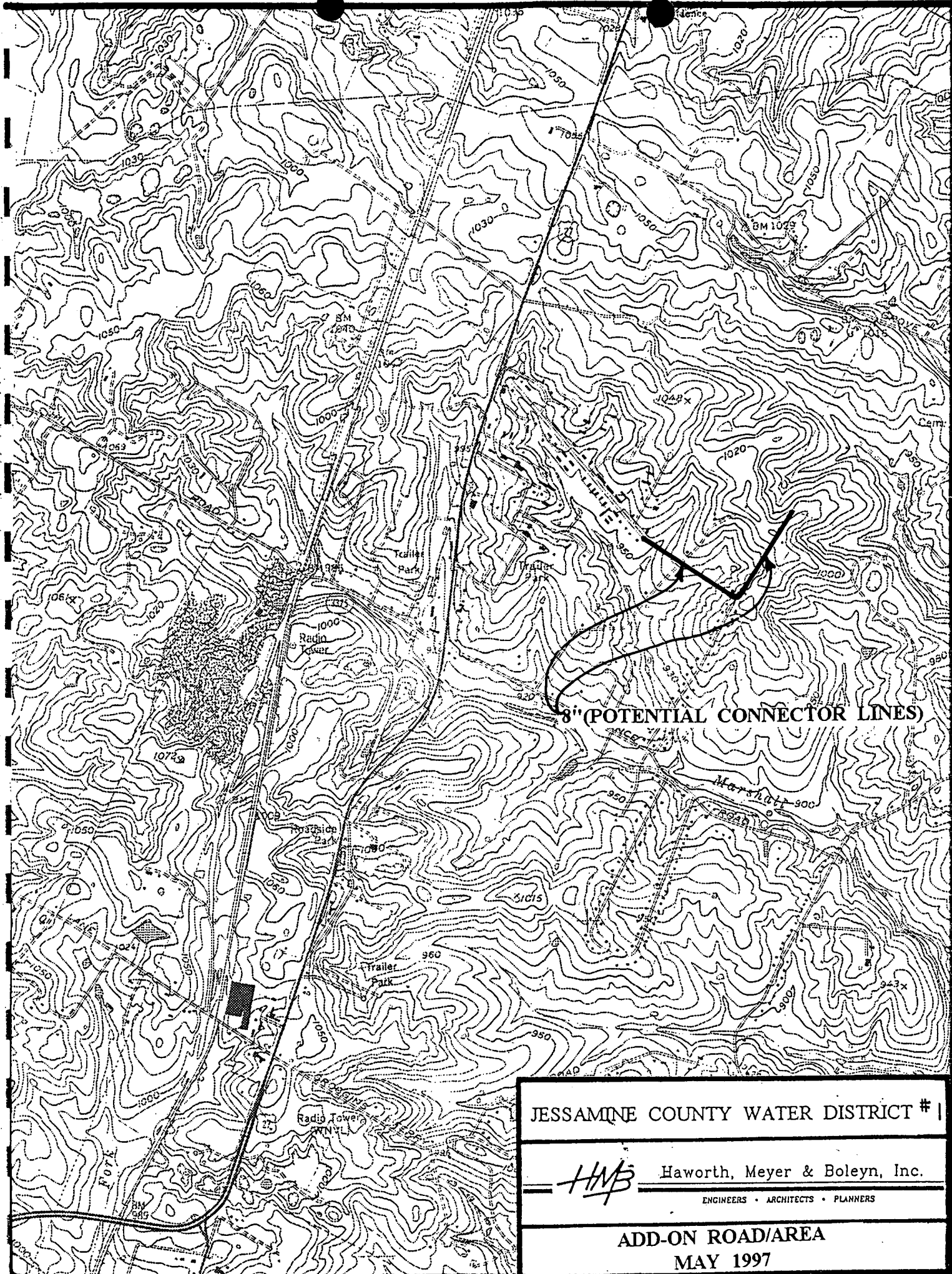
PROPOSED ELECTRICALLY OPERATED
BUTTERFLY VALVE VAULT

JESSAMINE COUNTY WATER DISTRICT

Haworth, Meyer & Boleyn, Inc.

ENGINEERS • ARCHITECTS • PLANNERS

ELEVATED WATER TANK PROJECT
MARCH '97



JESSAMINE COUNTY WATER DISTRICT # 1



Haworth, Meyer & Boleyn, Inc.

ENGINEERS • ARCHITECTS • PLANNERS

ADD-ON ROAD/AREA
MAY 1997

JAMES E. BICKFORD
SECRETARY



HME
PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

September 3, 1998

RECEIVED

SEP 11 1998

LC
JEM
Haworth, Meyer & Boleyn

Jessamine County Water District #1
200 West Maple Street
Nicholasville, Kentucky 40356

RE: DW #0570214-98-001
Water System Improvements
Wtr Storage Tank, Booster
Pump Station, Contract IV
Jessamine Co, Kentucky

Dear Sirs:

This is to advise that plans and specifications covering the above referenced subject are APPROVED with respect to sanitary features of design as of this date with the following stipulations:

1. Upon completion of construction, disinfection shall be strictly in accordance with the procedure designated in the State Regulations, which reads as follows:

"A water distribution system, including storage distribution tanks, repaired portions of existing systems, or all extensions to existing systems, shall be thoroughly disinfected before being placed into service. A water distribution system shall disinfect with chlorine or chlorine compounds, in amounts as to produce a concentration of at least fifty (50) ppm and a residual of at least twenty-five (25) ppm at the end of 24-hours (24) and the disinfection shall be followed by a thorough flushing."

New or repaired water distribution lines shall not be placed into service until bacteriological samples taken at the points specified in 401 KAR 8:150 Section 4 (2) are examined and are shown to be negative following disinfection.



An alternate acceptable method for storage tank disinfection is as follows:

Fill tank with enough water (containing a free chlorine concentration of at least 250 mg/l) to spray all inside tank surfaces with the chlorinated water. Repeat the spraying again at no less than 1.0 hour from the end of the first spraying. Drain the tank at no less than 30 minutes from end of second spraying before filling for use.

2. A minimum pressure of 30 psi must be available on the discharge side of all meters.
3. Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. A sewer is defined as any conduit conveying fluids other than potable water. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, this office may allow deviation on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer. This deviation will not be allowed for force mains.

Water mains crossing sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, one full length of the water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required.

4. The interior coating system for the proposed storage tank must be of a type approved by the Division of Water for use in contact with potable water.

Contract IV
September 3, 1998
Page three

5. The storage tank vent shall be screened to prevent the ingress of birds, animals and insects and shall be of a design to prevent freezing that may restrict the flow of air.
6. When this project is completed, the owner shall submit a written certification to the Division of Water that the above referenced water supply facilities have been constructed and tested in accordance with the approved plans and specifications and the above stipulations. Such certification shall be signed by a registered professional engineer.

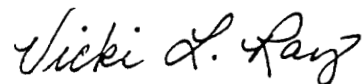
The project as proposed does not include any stream crossings or water withdrawal. Therefore, no permits are required.

The finished water supplied to the customers affected by this project will meet the current water quality parameters as dictated by the Federal Safe Drinking Water Act (PL 93-523), provided that construction of the project is completed in accordance with the approved plans and specifications and proper operation of the system is maintained.

This approval has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this approval does not relieve the applicant from the responsibility of obtaining any other approvals, permits or licenses required by this Cabinet and other state, federal and local agencies.

Unless construction of this project is begun within one year from the date of approval, the approval shall expire. If you have any questions concerning this project, please contact Bob Arnett, PE, at 502/564-2225, extension 578.

Sincerely,



Vicki L. Ray, Branch Manager
Drinking Water Branch
Division of Water

VLR:RNA:lm

Enclosures

Contract IV
September 3, 1998
Page four

C: HMB
Jessamine County Health Department
Public Service Commission
Frankfort Regional Office
Drinking Water Files

James L. Haworth, P.E. - Retired
Fred A. Meyer, P.E., L.A.
Phillip Boleyn, P.E., L.A.
Bob Blankenship, P.E.

Haworth, Meyer & Boleyn, Inc.

James H. Smith, P.E., L.S.
Bradley M. Meyer, P.E., L.S.
Joseph C. Pyles, P.E.
Karen Wood



ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
U.S. 460
Frankfort, KY 40601

RECEIVED
Office: (502) 695-9800
Fax: (502) 695-9810
JUL - 2 1999
PUBLIC SERVICE
COMMISSION

May 21, 1999

Gene Floyd
Rural Development
P.O. Box 1227
Shelbyville, KY 40066

RE: Final Engineering Report
Elevated Water Tank Project
Jessamine County Water District #1
HMB #430

Dear Gene:

The above referenced project was bid on April 27, 1999. The low bidder for the project was Caldwell Tanks, Inc., from Louisville, KY. Their bid was \$1,135,200.00, which exceeded the amount approved in the Letter of Conditions dated November 25, 1997.

The tank and appurtenances were not the only components to this project. The water line to the tank site was also described in the Preliminary Engineering Report and funded in the above referenced Letter of Conditions. However, as a condition of obtaining the tank site, at a cost of \$15,000 (rather than the asking price of \$50,000); the District agreed to lay the water line. This was discussed and approved by RD. Thus, in July, 1997, a change order was issued to Karish Construction Co. to lay the line. Karish was under contract to the District and KY DOT for a 10" water line relocation in the District's service area. Since their contract had been properly advertised and bid under DOT requirements; it saved the project \$35,000 in land acquisition costs; and the water line had to be laid in any case, all agreed it was prudent to proceed with it. The line was completed in May, 1998. The Water District's O & M Account would be reimbursed from the proceeds of the bond sale for the costs associated with this water line construction.

442 Metroplex
Suite 105
Nashville, TN 37211
(615) 834-4335

624 West Main Street
Louisville, KY 40202
(502) 587-0875

2500 Fairlane Drive
Building 1, Suite 170
Montgomery, AL 36116
(334) 277-1002

325 Sixth Avenue
South Charleston, WV 25303
(304) 744-5200

1410 Charlestown-New Albany Pike
Suite 201
Jeffersonville, IN 47130
(812) 288-8961

The attached pages outline our:

- Revised Project Cost
- Revised Funding
- Additional Funding Required
- Customer Analysis
- Water Purchase Expense
- O & M Expenses
- Debt Service
- Coverage
- Summary of Annual Expenses
- Income Projections
- Summary of Income
- Recommendations

Attached please find a copy of the Bid Tabulation for the tank project, and a copy of the Final Pay Request for the water line construction.

The Jessamine County Water District #1 shall need additional monies from Rural Development to complete this project.

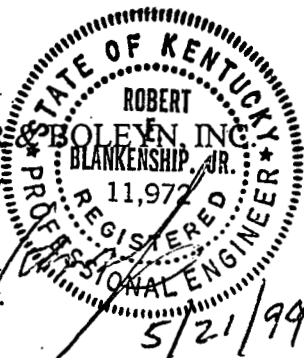
We request that you note our recommendations, and approve them as soon as possible. Please contact us if there are any questions.

We have checked references and recommend the Award of the Construction Contract to Caldwell Tanks, Inc.

Sincerely,

HAWORTH, MEYER & BOLEYN, INC.


Bob Blankenship, P.E.



cc: Carl Waits, Chairman
Martin East, Project Attorney
Howard Downing, JCWD #1, Attorney
Henry Reed III, Bond Council
John Martin, HMB
Larry Cann, HMB
Cad McDonald, HMB

FINAL ENGINEERING REPORT
 JESSAMINE COUNTY WATER DISTRICT #1
 ELEVATED WATER TANK PROJECT

1. Revised Project Cost

| | <u>Letter of Conditions</u> | <u>As Bid</u> |
|----------------------------------|-----------------------------|-----------------|
| Development ¹ | | |
| Water Tank & Appurtenances | \$895,000 | \$1,135,200 |
| Water Line to Tank | — | \$67,830 |
| Engineering Fees | \$109,000 | \$130,160 |
| Resident Inspection Fees | \$43,000 | \$52,930 |
| Legal & Administrative Costs | \$20,000 | \$20,000 |
| Contingencies | \$90,000 | \$45,180 |
| Land and/or Rights | \$15,000 | \$20,000 |
| Interest during Construction | \$20,000 | \$20,000 |
| Archaeological & Misc. Costs | <u>\$2,000</u> | <u>\$700</u> |
| Total Estimated Project Cost | \$1,194,000 | \$1,492,000 |

2. Revised Funding

| | | |
|----------|-------------|-------------|
| RUS Loan | \$1,194,000 | \$1,492,000 |
|----------|-------------|-------------|

3. Additional Funding Required

The project shall require an additional \$298,000 in RUS Loan.

4. Customer Analysis

The Preliminary Engineering Report assumed the total number of connections would be 855 (1248 ± customers); feasibility for the project was based on this number of connections. In actuality, the number of connections in April, 1999 was 982 (1374 ± customers) and 1 large motel. The actual growth has exceeded the estimated. We are not considering a second motel of approximately equal size to the existing which is scheduled to open for business in the summer, 1999; nor additional residential growth in the system which appears to be in excess of 13% (ie, at current annual rate from 1996 through April, 1999).

¹Water Tank was bid on April 27, 1999; the water line was constructed by Change Order (with RD approval) between July '97 and May '98 by the Contractor doing a DOT utility relocation for the District; water line construction paid for by the District and to be reimbursed from proceeds of this project.

5. Water Purchase Expense

From the Preliminary Engineering Report, the estimated cost for the 855 connections was \$192,400. The cost for the added customers in excess of the 855 is as follows:

| | |
|---|----------------|
| Cost = 127 customers x 4568 gal/mo. x \$1.85/1000 x 12 months = | \$12,880 |
| Cost = 1 motel x 51800 gal/mo. x \$1.85/1000 x 12 months = | <u>\$1,150</u> |
| Additional Cost | \$14,030 |
| (Say) | \$14,000 |

| | |
|--|-------------------|
| Total Estimated Water Purchase Costs = | \$192,400 |
| | + <u>\$14,000</u> |
| | \$206,400 |

6. O & M Expenses (Excluding Water Purchase)

Existing O & M expenses and projected O & M expenses for the tank project were presented in the Engineering Report as \$188,100 through December 1998. We assumed a 5% inflationary increase for 2 years to extend through December, 2000. Therefore, the estimated O & M expenses would be \$207,400.

7. Debt Service

a. Proposed Tank Project

Feasibility in the Preliminary Engineering Report was based on an RD loan of \$1,194,000 for 40 years at an interest rate of 5.5%.

The actual terms shall be an RD loan of \$1,492,000 for 40 years at an interest rate of 5%. The proposed Debt Service shall be \$88,475/year.

b. Existing System

The existing debt will not change as a result of this project. As presented in the Engineering Report, the existing Debt Service was \$33,800 for 1998. The audit indicates the existing Debt Service for 2000 shall be \$34,000.

8. Coverage

Coverage was estimated to be 10% of both the existing Debt Service or \$3,400, and the proposed Debt Service or \$8,850.

9. Summary of Annual Expenses

| | <u>Water Purchase</u> | <u>O & M Expense</u> | <u>Debt Service</u> | <u>Coverage @ 10%</u> | <u>Total</u> |
|-------------------------------------|---------------------------|------------------------------|-------------------------|---------------------------|-----------------|
| Existing System | \$192,400 | \$151,600 | \$34,000 | \$3,400 | \$381,400 |
| Tank Project | \$0 | \$36,500 | \$88,475 | \$8,850 | \$133,825 |
| Extension of Costs to Dec., 2000 | <u>\$14,000</u> | <u>\$19,300</u> | <u>\$ —</u> | <u>\$ —</u> | <u>\$33,300</u> |
| Total | \$206,400 | \$207,400 | \$122,475 | \$12,250 | \$548,525 |

10. Income Projections

The proposed Rate Structure is presented on pages 8 & 8A of the RD Summary Addendum attached to the Preliminary Engineering Report. These proposed rates should generate approximately \$508,700 in income for the 855 connections as previously described. The added customers (as discussed in Section 4, above) should generate the below listed additional income (using the Proposed Rates):

| | |
|--|-------------------|
| 127 customers x \$24.59/month ⁽¹⁾ x 12 months | = \$37,475 |
| 1 motel x \$218.78/month ⁽²⁾ x 12 months | = <u>\$ 2,625</u> |
| Total | \$40,100 |

Note: ⁽¹⁾ 127 customers usage based on average usage of 4,568 gal./month

⁽²⁾ 1 motel based on average usage of 51,800 gal./month, based on last 8 months average usage.

11. Summary of Income

| | |
|-----------------------------------|------------------------------|
| Water Sales (Proposed Rates) | |
| 855 Connections | \$508,700 ⁽¹⁾ |
| 128 New Connections | \$40,100 |
| Interest Income | \$1,000 ⁽²⁾ |
| Penalties | \$5,000 ⁽²⁾ |
| Service Charges | <u>\$2,000⁽²⁾</u> |
| Total Income | \$556,800 |
| | |
| Total Expenses (Section 9, above) | <u>\$548,525</u> |
| | |
| Surplus (Deficit) | \$8,275 ⁽³⁾ |

Notes:

(1) See Pages 10 & 10A of the above referenced RD Summary Addendum attached to the Engineering Report.

(2) See Page 18 of the Engineering Report.

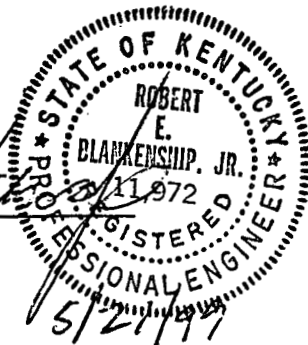
(3) Surplus generated without projecting any added customer growth beyond April, 1999; did not include 2nd motel going on line Summer, 1999; did extend O & M expenses through December, 2000.

12. Recommendations

- a. The Jessamine County Water District #1 should be awarded an additional RD loan of \$298,000.
- b. They be given the current interest rate of 5% for 40 years.
- c. The Tank Project, as bid on April 27, 1999, be approved and awarded to Caldwell Tanks, Inc. (low bidder).
- d. The District be reimbursed the \$67,830 it paid to lay the water line to the tank site.
- e. The proposed rates as outlined in the Preliminary Engineering Report, dated April, 1997, be approved.
- f. RD issue a Letter of Concurrence as soon as possible.

Respectfully Submitted,


Bob Blankenship, P.E.



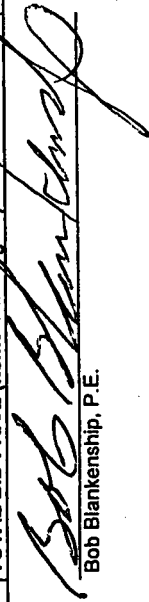
BID TABULATION

**CONTRACT IV - JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND PUMP STATION**

Bid Date: 04/27/99

| ITEM # | DESCRIPTION | QUANTITY | UNIT | CALDWELL TANKS, INC. | | PHOENIX FABRICATOR AND ERECTORS, INC. | | BROWN STEEL CONTRACTOR'S, INC. | |
|--|--|----------|------|----------------------|-----------------------|---------------------------------------|-----------------------|--------------------------------|-----------------------|
| | | | | UNIT PRICE | TOTAL | UNIT PRICE | TOTAL | UNIT PRICE | TOTAL |
| 1 | 1,000,000 Gallon (nominal) Elevated Water Storage Tank including, but not limited to tank foundation, valve vault, site preparation, excavation, fencing, connection to existing line, valves, piping, and all appurtenances, as shown on the Plans and Specifications, complete in place | | L.S. | | \$941,200.00 | | \$1,001,697.00 | | \$1,067,200.00 |
| 2 | Mainline Pressure Reducing Valve Station including, but not limited to valves, piping, fittings, conc. vault as shown on the Plans and Specifications, complete in place. | | L.S. | | \$26,000.00 | | \$25,900.00 | | \$25,000.00 |
| 3 | Radio Telemetering Control System including but not limited to two (2) RTU's located at the new tank and pump station, conduit and wiring from the existing pump station to the proposed flow control valve as shown on the Plans and Specifications, complete in place. | | L.S. | | \$36,000.00 | | \$76,000.00 | | \$75,800.00 |
| 4 | Underground Booster Pump Station including, but not limited to 2- 350 gpm pumps, piping, controls, capsule, heaters, fans, lights, ladder, dehumidifier, sump pump, valves, fittings, sitework, fencing, gate, concrete and conduit as shown on the Plans and Specification, complete in place | | L.S. | | \$102,000.00 | | \$109,950.00 | | \$105,000.00 |
| 5 | Flow Control Valve Station including, but not limited to valves, piping, wiring from the booster pump station fittings, conc. vault and all appurtenances, as shown on the Plans and Specifications, complete in place. | | L.S. | | \$30,000.00 | | \$34,300.00 | | \$27,000.00 |
| TOTAL BID PRICE (Items 1 through 5) | | | | | \$1,135,200.00 | | \$1,247,847.00 | | \$1,300,000.00 |

Bob Blankenship, P.E.



HMB's Copy

#430

APPLICATION FOR PAYMENT

Contractor: Karish Construction Co., Inc.

Contract For: Groggin Ferry/Elevated Water Tank Project

Contract Date: July 22, 1997

Application Date: May 22, 1998

Application Amount: \$52,681.58

For Period Ending: May 22, 1998

To: Jessamine County Water District # 1

Attached hereto is the Contractor's Application for Payment for work accomplished under the above contract through the date indicated above. Accompanying the Application for Payment is the Contractors Affidavit stating that all previous payment to him under this Contract have been applied by him to discharge in full all of his obligations in connection with the work covered by all prior Applications for Payment.

In accordance with the above Contract, the undersigned recommends payment to the Contractor of the Total Amount Due This Payment as shown below.

Date:

6/15/98

Haworth, Meyer & Boléyn, Inc.
Engineers

By:

[Signature] PE
(Name) (Title)

STATEMENT OF WORK

| | |
|-------------------------|--------------------|
| Original Contract Price | <u>\$68,520.50</u> |
| Net Change Order | <u>\$0.00</u> |
| Current Contract Price | <u>\$68,520.50</u> |
| Work to be Done | <u>\$690.25</u> |

| | |
|---|------------------------------------|
| Total Amount Earned | <u>\$67,830.25</u> |
| Less Retainage | \$0.00 \$5200.00 |
| Subtotal | \$67,830.25 \$62,630.25 |
| Less Previous Payment Due to Contractor | <u>\$15,148.67</u> |
| Less Liquidated Damages | <u>\$0.00</u> |
| Total Amount Due This Payment | <u>\$52,681.58</u> \$47,481.58 |

Contract Documents For
Jessamine County Water District # 1
Groggin Ferry/Elevated Water Tank Project

FINAL PAY REQUEST

APPLICATION FOR PAYMENT

Sheet 2 Of

Estimate for Payment No. 2

Owner's Contract No.

Contract Name: Jessamine County Water District # 1 - Groggin Ferry/Elevated Water Tank Project

Engineers Project No.: 1

For the Period: July 22, 1997

To: May 22, 1998

Original Completion Date:

Total Evaluated Bid at Time of Letting:

| AS BID INFORMATION | | | | WORKED PERFORMED TO DATE | | | | |
|--------------------|-------------------------------------|--------------|------------|-------------------------------|---|---------------------------------------|---|---|
| Item No. | Description | No. of Units | Unit Price | Estimated Cost (3)x(4)=(5) | Units Completed Previous Estimate 6 | Units Completed This Estimate 7 | Total Units Completed (6)+(7)=(8) | Amount Earned To Date (4)x(8)=(9) |
| 1 | 12" PVC Class 200 SDR 21 Water Main | 2750 | 19.25 | 52,937.50 | 0 | 2607 | 2607 | 50,184.75 |
| 2 | Steel Casing Pipe = 20" (Open Cut) | 40 | 52.80 | 2,112.00 | 0 | 40 | 40 | 2,112.00 |
| 3 | 12" Gate Valve & Box | 4 | 1,747.50 | 6,990.00 | 0 | 4 | 4 | 6,990.00 |
| 4 | 10" Gate Valve & Box | 1 | 995.00 | 995.00 | 0 | 1 | 1 | 995.00 |
| 5 | Dry Tap - Tee & Reducer | 1 | 2,149.10 | 2,149.10 | 0 | 1 | 1 | 2,149.10 |
| 6 | 6" Fire Hydrant | 2 | 2,699.70 | 5,399.40 | 0 | 2 | 2 | 5,399.40 |
| 7 | | | | 0.00 | 0.00 | 0 | 0 | 0.00 |
| 8 | | | | 0.00 | 0.00 | 0 | 0 | 0.00 |
| | | | | 70,583.00 | | | Accumulative Total | 67,830.75 |

Application for Payment
Page 2 of 3

Contract Documents for
Jessamine County Water District # 1
Groggin Ferry/Elevated Water Tank Project

CERTIFICATE OF THE CONTRACTOR OR HIS DULY AUTHORIZED REPRESENTATIVE

To the best of my knowledge and belief, I certify that all units, quantities and prices of work and material on the sheets 1, 2, 3 of this estimate are correct; that all work has been and materials supplied in full accordance with the terms and conditions of the corresponding Contract Documents between the undersigned as Contractor and the Owner and all authorized changes thereto; that the following is a true and correct statement of the contract amount up to and including the last day of the period covered by this estimate and that no part of the period covered by this estimate and that no part of the "Total Amount Due" has been received.

| | | | |
|-----|---|----|-----------------------------------|
| (a) | Total amount earned (Column 9) | \$ | \$7,830.25 |
| (b) | Total Stored Material | \$ | 0.00 |
| (c) | Less Retained Percentage X (a) | \$ | 0.00 \$52,000.00 |
| (d) | Total Earned Less Retained Percentage | \$ | \$7,830.25 \$62,630.25 |
| (e) | Less Total Previously Paid (d) + (h) From Last Pay Estimate | \$ | 15,148.67 |
| (f) | Less Previously Liquidated Damages (e) + (g) From Last Pay Estimate | \$ | 0.00 |
| (g) | Amount Due This Estimate | \$ | \$2,681.58 \$47,481.58 |
| (h) | Less Additional Liquidated Damages | \$ | 0.00 |
| (i) | Total Amount Due | \$ | \$2,681.58 \$47,481.58 |
| (j) | Total Value of Change Orders, Divided By Total Evaluated Bid Estimate | | |

I hereby certify that the labor and materials listed on this request for payment have been used in the construction of the work and that all materials included in this Application for payment have been incorporated into the construction; and payment received from the Application for Payment has been used to make payment to all first their Subcontractors and Suppliers, except as listed below:

CONTRACTOR: Karish Construction Co., Inc.
 BY: [Signature]

Date: 5/22/68
 TITLE: PRESIDENT

ENGINEERS APPROVAL OF QUANTITIES

ENGINEER: [Signature]
 BY: [Signature]
 Date: 6/15/68

Haworth, Meyer & Boleyn, Inc.



United States
Department of
Agriculture

Rural
Development

Corporate Drive, Suite 200
Lexington, KY 40503-5477
(606) 224-7336 TTY(606) 224-7422

June 24, 1999

RECEIVED

JUL - 2 1999

PUBLIC SERVICE
COMMISSION

SUBJECT: Jessamine County Water District No. 1
Concurrence in Contract Award

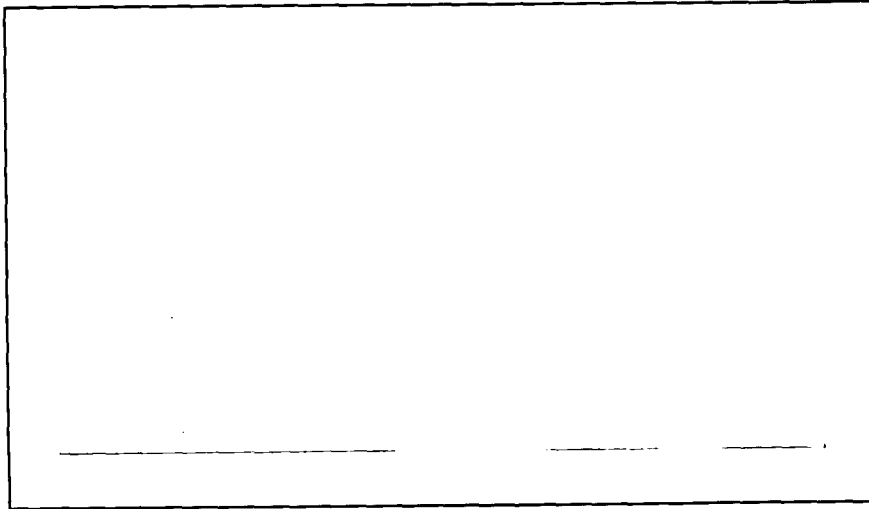
TO: Rural Development Manager
Shelbyville, Kentucky

Based on the bids received and the recommendation of the consulting engineer, Rural Development concurs in the award of a contract for construction of an elevated water storage tank to Caldwell Tanks, Inc. in the amount of \$1,135,200.

for *Thomas G. Fern*
THOMAS G. FERN
State Director
Rural Development

cc: ✓ HMB, Inc.
Frankfort, Kentucky

Henry M. Reed, III
Louisville, Kentucky



RECEIVED
JUL - 2 1999
PUBLIC SERVICE
COMMISSION



Haworth, Meyer & Boleyn Inc.

ENGINEERS • ARCHITECTS • PLANNERS

CONTRACT IV
JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY

JUNE 1998

Prepared By:

Haworth, Meyer & Boleyn, Inc.
3 HMB Circle, US 460
Frankfort, Kentucky 40601

(502) 695-9800
(502) 695-9810 FAX

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ADVERTISEMENT FOR BIDS

CONTRACT IV

JESSAMINE COUNTY WATER DISTRICT NO.1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION

APRIL 1999

Sealed proposals for the following work will be received by the Jessamine County Water District No.1 at 200 W. Maple Street, Nicholasville, KY 40356 until 1:00 P.M. (local time) Tuesday, April 27, 1999, for furnishing labor and materials and performing all work as set forth in this Advertisement for Bids, General Conditions, Specifications and/or Drawings prepared by Haworth, Meyer & Boleyn, Inc., 3 HMB Circle, US 460, Frankfort, Kentucky 40601.

Immediately following the scheduled closing time for the reception of bids, all proposals which have been submitted in accordance with the above conditions will be publicly opened and read aloud.

The work to be bid upon is described as follows:

- A 1,000,000 gallon (nominal) elevated water storage tank including tank, tank foundation, site preparation, excavation, valve vault, and all appurtenances, as shown on the plans and specifications, complete in place.
- Mainline PRV Station
- 350 GPM Booster Pumping Station
- Flow Control Valve Vault
- Radio Telemetry Control System

Drawings, Specifications and Contract Documents may be examined at the following places:

Jessamine County Water District No. 1
200 W. Maple Street
Nicholasville, KY 40356

Haworth, Meyer & Boleyn, Inc.
3 HMB Circle, US 460
Frankfort, KY 40601

F.W. Dodge Corporation
One Paragon Centre-Suite 230
2525 Harrodsburg Road
Lexington, KY 40504

Associated General Contractors
2321 Fortune Drive, Suite 112
Lexington, KY 40509

Builder's Exchange of Louisville
2300 Meadow Drive
P.O. Box 5398
Louisville, KY 40205

F.W. Dodge/ABC Planroom
1812 Taylor Avenue
Louisville, KY 40213

or may be obtained from Lynn Blue Print & Supply Company, 328 Old East Vine Street, Lexington, KY 40507 upon receipt of a non-refundable payment as follows:

Contract IV - Jessamine County Water District No. 1
1,000,000 Gallon Elevated Water Storage Tank
and Booster Pump Station \$100.00 per set

After award of a contract, the General Contractor will be furnished, without charge, a reasonable number of plans and specifications needed to prosecute the work. Subcontractors and manufacturers and suppliers shall obtain plans and specifications from the General Contractor.

Sealed proposals for the Contract shall be clearly marked on the outside of the container as follows:

"Sealed proposal for Contract IV - Jessamine County Water District No. 1, 1,000,000 Gallon Elevated Water Storage Tank and Booster Pump Station.

Not to be opened until 1:00 P.M. (local time), April 27, 1999

(time and date of bid opening)

"The following addenda have been received and considered in the enclosed proposal:"

Addendum No.____ Addendum No.____ Addendum No.____

Time allowed for completion of Contract IV is 270 calendar days

If forwarded by mail, the sealed envelope containing the proposal must be enclosed in another envelope and mailed to the Jessamine County Water District No. 1, 200 W. Maple St., Nicholasville, KY 40356 allowing sufficient time for such mailing to reach this address prior to the scheduled closing time for the receipt of proposals.

Bids shall be accompanied by a certified check or bid bond payable to the Jessamine County Water District No.1 in an amount not less than five percent (5%) of the base bid. No bidder may withdraw his bid for a period of ninety (90) days after the date bids are opened. He may, however, withdraw his bid at any time prior to the time and date scheduled for opening of same or any authorized postponement thereof. Any bid received after the time and date specified will not be considered and will be returned unopened to the bidder.

The Jessamine County Water District No.1, reserves the right to reject any and all bids and to waive formalities and any bid that is obviously unbalanced may be rejected.

Bidders must comply with the President's Executive Order Nos. 11246 and 11375, which prohibit discrimination in employment regarding race, creed, color, sex, or national origin. Bidders must comply with Title VI of the Civil Rights Act of 1964, the Anti-Kickback Act, Section 3 Segregated Facilities, Section 109 and the Contract Work Hours Standard Act.

Bidders must certify that they do not, and will not, maintain or provide for their employees any facilities that are segregated on the basis of race, color, creed or national origin.

Federal law prohibits discrimination on the grounds of race, color, national origin, religion, age, handicap, and sex in this project. Minority firms are particularly encouraged to participate.

Carl Waits,
Chairman

INFORMATION FOR BIDDERS

BIDS will be received by See Advertisement

(herein called the "OWNER"), at See Advertisement

until See Advertisement, 19____, and then at said office publicly opened and read aloud.

Each BID must be submitted in a sealed envelope, addressed to See Advertisement at See Advertisement. Each sealed envelope containing a BID must be plainly marked on the outside as BID for See Advertisement and the envelope should bear on the outside the BIDDER'S name, address, and license number if applicable, and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at See Advertisement

All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the above-scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. After BIDS have been submitted, the BIDDER shall not assert that there was a misunderstanding concerning the quantities of WORK or of the nature of the WORK to be done.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned and rights-of-way acquired or to be acquired.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve the contractor from fulfilling any of the conditions of the contract.

Each BID must be accompanied by a BID bond payable to the OWNER for five percent of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible BIDDERS. When the Agreement is executed the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the payment BOND and performance BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A performance BOND and a payment BOND each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or payment BONDS and performance BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the performance BOND and payment BOND within ten (10) calendar days from the date when NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the Property of the OWNER.

The OWNER within ten (10) days of receipt of acceptable performance BOND, payment BOND and Agreement signed by the party to whom the Agreement was awarded shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw the signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER AND CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest responsible BIDDER.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to its BID.

Further, the BIDDER agrees to abide by the requirements under Executive Order No. 11246, as amended, including specifically the provisions of the equal opportunity clause set forth in the SUPPLEMENTAL GENERAL CONDITIONS.

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when required to do so by the OWNER.

Inspection trips for prospective BIDDERS will leave from the office of the none scheduled
at _____

The ENGINEER IS Haworth, Meyer & Boleyn, Inc.

The ENGINEER'S address is 3 HMB Circle, U.S. 460, Frankfort, KY 40601

GENERAL CONDITIONS

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SIDEWALKS, CURBS, ETC.

1. DEFINITIONS

- 1.1 The following terms used in the Contract Documents shall be applicable to both the singular and plural and be defined as follows:
- 1.2 Addenda - Instructions, either written or graphic issued prior to the execution of the Agreement or portions thereof which modify or interpret the Contract Documents, Drawings, and Specifications, by deletions, additions, clarifications or corrections.
- 1.3 Bid - The proposal or offer submitted by the Bidder on prescribed forms setting forth prices for work to be performed.
- 1.4 Bidder - A person, firm or corporation submitting a Bid for the proposed work.
- 1.5 Bonds - Instruments of Security in the form of Bid, Performance or Payment Bonds, furnished by the Contractor and surety in accordance with Contract Documents.
- 1.6 Change Order - A written order to the Contractor authorizing revisions, deletions, or additions to the work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.
- 1.7 Contract Documents - The Contract and all other instruments associated with the Contract including Advertisement For Bids, Information For Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice To Proceed, Change Orders, Drawings, Specifications and Addenda.
- 1.8 Contract Price - The total sum of monies payable to the Contractor under the conditions and terms set forth in the Contract Documents.
- 1.9 Contract Time - The number of calendar days set forth in the Contract Documents for completion of the work.
- 1.10 Contractor - A person, firm or corporation with whom the Owner has executed a Contract or Agreement.
- 1.11 Drawings - A portion of the Contract Documents that illustrate the characteristics and scope of Work to be performed and which have been prepared and approved by the Engineer and appropriate Regulatory Agencies.
- 1.12 Engineer - The person, firms or corporations named as such in the Contract Documents.

- 1.13 Field Order - A written notice or order issued by the Engineer effecting a change in the Work that does not result in an amendment in Contract Price or Contract Time.
- 1.14 Notice of Award - A written notice issued by the Owner to the Bidder accepting his Bid.
- 1.15 Notice to Proceed - A written document issued by the Owner to the Contractor authorizing initiation of the Work and firmly establishing the date of initiation of such Work.
- 1.16 Owner - The public body or authority for whom the Work is being performed.
- 1.17 Project - A task to be performed as set forth in the Contract Documents.
- 1.18 Resident Project Representative - An authorized representative of the Owner that is assigned to the Project site or any portion thereof.
- 1.19 Shop Drawings - Diagrams, brochures, schedules, drawings, and other data that have been prepared by the Contractor, Subcontractor, manufacturers, suppliers, or distributors, that illustrates installations or fabrication of specific portions of the Work.
- 1.20 Specifications - A portion of the Contract Documents that contains written descriptions concerning materials, equipment, construction methods, standards, and workmanship.
- 1.21 Subcontractor - An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of the Work.
- 1.22 Substantial Completion - The date certified by the Engineer that construction on the Project or any portion thereof is sufficiently complete, in accordance with Contract Documents to permit the Project or portions thereof to be utilized for the purpose intended.
- 1.23 Supplemental General Conditions - Modifications to the General Conditions that may be required by the Federal, State, or Local agencies for participation in the Project and approved in writing by the agency prior to inclusion in the Contract Documents or such requirements that may be imposed by applicable state law.

1.24 Supplier - Any person, firm or organization that supplies material or equipment for accomplishing the Work, including fabrication, but does not perform labor at the Work site.

1.25 Work - Labor, materials, and equipment necessary to satisfy the construction requirements by the Contractor in accordance with the Contract Documents.

1.26 Written Notice - A written communication to any party of the Agreement. Such notices will be considered delivered when posted by certified or registered mail to the last known address of the addressee or when hand delivered to addressee or his authorized representative.

2. CONTRACT AND CONTRACT DOCUMENTS

Plans, Specifications and Addenda shall form a part of the contract and the provisions thereof shall be as binding upon the parties hereto as if they were fully set forth herein. Tables of Content, Titles, and Headings contained in said documents are solely for the purpose of reference and have no limiting effect of the interpretation of the provisions to which referenced.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The Contractor shall submit to the Owner such schedules of quantities, costs, progress reports, estimates, record and other information as may be requested by the Owner.

3.2 The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Owner/Engineer, prepare and submit to the Owner/Engineer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Owner/Engineer may withhold approval of progress payments until the Contractor submits the required schedule.

- 3.3 The Contractor shall enter the actual progress on the chart as directed by the Owner/Engineer, and upon doing so shall immediately deliver three copies of the annotated schedule to the Owner/Engineer. If, in the opinion of the Owner/Engineer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Owner/Engineer, without additional cost to the Owner. In this circumstance, the Owner/Engineer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount to construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Owner/Engineer deems necessary to demonstrate how the approved rate of progress will be regained.
- 3.4 The Contractor shall also furnish on forms supplied by the Owner (a) a detailed estimate giving a complete breakdown of the Contract Price and (b) periodic itemized estimates of Work done for the purpose of making partial payments thereon. The cost employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deduction from the Contract Price.
- 3.5 The Contractor will also submit dates for submission of Shop Drawings, the beginning of manufacture, testing and installation of materials, equipment and supplies. The Contractor shall also submit dates that special detail drawings will be required, if any, by the Engineer.
- 3.6 Failure of the Contractor to comply with the requirements of the Owner/Engineer under this clause shall be grounds for a determination by the Owner/Engineer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the contract. Upon making this determination, the Owner/Engineer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the terms of this contract.

4. ADDITIONAL INSTRUCTIONS AND DETAILED DRAWINGS

- 4.1 The Contractor will be provided with additional instructions and detailed small letters Drawings as necessary to carry out the Work set forth in the Contract Documents.

4.2 Additional drawings and instructions supplied to the Contractor will become a part of the Contract Documents. In the event of conflict between additional drawings and instructions and the Contract Documents, the Contractor shall notify the Engineer immediately in writing.

5. DRAWINGS AND SPECIFICATIONS

- 5.1 The Drawings, Specifications, and Addenda shall become a part of the Contract Documents and are provided with the intent that the Contractor shall furnish all labor, materials, tools, equipment and transportation necessary for proper execution of the Work in accordance with the Contract Documents and all other incidental work necessary to complete the Project in an acceptable manner, ready for use, occupancy or operation by the Owner.
- 5.2 The Engineer, without charge, will furnish to the Contractor not more than eight (8) sets of the Plans and Specifications. If additional sets of documents are required by the Contractor for the proper handling of the Work, such documents will be furnished to the Contractor at cost.
- 5.3 Should there be conflict between Drawings and Specifications, the Specifications shall govern and detailed Drawings shall govern over general Drawings. Figure dimensions on Drawings shall govern over scale dimensions.
- 5.4 All work or materials shown on the Plans and not mentioned in the Specifications or any work specified and not shown on the Plans, shall be furnished, performed, and done by the Contractor as if the same were both mentioned in the Specifications and shown on the Plans.
- 5.5 Should the Contractor in preparing his Bid find anything necessary for the construction of the Project that is not mentioned in the Specifications or shown on the Plans, or find any other discrepancy in the Specifications, Plans or Contract Documents, he shall notify the Engineer so that such discrepancies may be corrected by addendum prior to the letting. Should the Contractor fail to notify the Engineer of such discrepancies, it will be assumed that his Bid included everything necessary for the complete construction in the spirit and intent of the designs shown.

5.6 In the event the Contractor should note discrepancies between the Drawings and the Specifications, and site conditions or any other inconsistencies, or ambiguities, such inconsistencies or ambiguities shall be reported immediately to the Engineer in writing. The Engineer shall promptly correct such inconsistencies or ambiguities in writing. Any Work done by the Contractor subsequent to his discovery of such inconsistencies or ambiguities shall be done at the Contractor's risk.

5.7 The Contractor shall, during the course of the construction, maintain an updated set of plans, marked by the Contractor, showing all deviations from the original and such notes as required to clarify the cause of such deviations and showing final locations of underground utilities such as sewer service connections and buried valves by giving offset distances to surface improvements such as building corners, curbs, manholes, etc. The purpose of these updated plans are to facilitate the completion of the record drawings by the Engineer after the completion of the Work. Nothing in this section shall be construed to relieve the Contractor from obtaining the Engineer's prior written approval for any deviation from the Plans or Specifications.

6. SHOP OR SETTING DRAWINGS

6.1 The Contractor shall promptly submit to the Engineer four (4) copies of each Shop Drawing regarding proposed materials and equipment to be supplied for the project. Subsequent to examination of such Shop Drawings by the Engineer and the return thereof, the Contractor shall make such corrections to the Shop Drawings as have been indicated and shall furnish the Engineer with two (2) corrected copies. Regardless of corrections made on or review given to such Shop Drawings by the Engineer, any Shop Drawing which substantially deviates from the requirements of the Contract Documents shall be evidenced by a Change Order. Review of Shop Drawings by the Engineer shall in no way relieve the Contractor from responsibility for deviations from the Contract Documents unless specifically stated in writing by the Engineer.

6.2 Work requiring the submission of a Shop Drawing by the Contractor shall not be initiated until the Shop Drawing has been submitted to and reviewed by the Engineer. The Contractor shall certify to the Engineer that he has checked and approved the Shop Drawings and that they are in accordance with the requirements of the Contract Documents.

7. MATERIALS, SERVICES AND FACILITIES

- 7.1 Except as otherwise stated in the Contract Documents, the Contractor shall furnish any pay for all materials, labor, tools, equipment, utilities, transportation, supervision, temporary construction and all other services and facilities required in the execution, completion and delivery of the Work in accordance with the Contract Documents.
- 7.2 Storage of materials and equipment to be used in the Project shall be accomplished in a manner to insure security, preservation of quality, and suitability for incorporation in the Work.
- 7.3 Manufactured equipment and materials shall be installed, constructed and erected by the Contractor in strict accordance with the manufacturer's direction unless specifically directed otherwise in writing by the Engineer.
- 7.4 Manufactured equipment and materials to be used in the Project shall be the same as samples submitted to and approved by the Engineer. Second hand or salvaged materials will not be permitted unless specifically provided for in the Contract Documents.
- 7.5 Any Work necessary to be performed after regular hours, on Sundays or Legal Holidays, shall be performed without additional expense to the Owner.

8. CONTRACTOR'S TITLE TO MATERIALS

No manufactured equipment, materials, or supplies to be used in the Work shall be purchased by the Contractor or Subcontractor subject to any chattel mortgage, conditional sales contract or other agreement by which an interest is retained by the Seller. The Contractor and Subcontractor shall warrant that he has good title to all materials and supplies used by him in the Work, free of all liens, claims or encumbrances.

9. INSPECTION AND TESTING

- 9.1 All manufactured equipment, materials and supplies used in the construction of the Project shall be subject to inspection, testing, and observation in accordance with generally accepted standards as required and defined in the Contract Documents.
- 9.2 The cost of testing and inspection services required by the Contract Documents shall be borne by the Contractor unless otherwise specified.

- 9.3 All other inspection and testing services not required by the Contract Documents, shall be borne by the Owner.
- 9.4 In the event that Contract Documents, laws, ordinances, regulations, rules, orders or other directions of any public authority having jurisdiction over the Work requires specific inspection, testing or approval of someone other than the Contractor, the Contractor shall provide the Engineer timely notice of readiness and the Contractor shall furnish the Engineer with the required certificates of inspection, testing or approval as appropriate.
- 9.5 Neither observation by the Engineer nor inspections, tests, or approvals by others relieve the Contractor of his obligations to perform the Work as required in the Contract Documents.
- 9.6 The Engineer, Owner and their representatives shall have access to the Work at all times. In addition, representatives and agents of Federal, State and Local governments having jurisdiction of any portion of the Work shall be permitted to inspect the Work, materials, payrolls, records of personnel, invoices of materials and other relevant data and records, in accordance with Federal laws. Proper facilities shall be provided by the Contractor for such access, observation, inspection and testing of the Work.
- 9.7 Should any Work be covered contrary to the written instructions of the Engineer, such Work shall be uncovered for observation and replaced at the Contractor's expense.
- 9.8 Should any Work be covered which the Engineer has not specifically requested to observe prior to its being covered, or should the Engineer consider it necessary that such Work be inspected or tested by others, the Contractor, shall, at the Engineer's written request, uncover or otherwise expose the Work in question for observation, inspection or testing. The Contractor, shall furnish all labor, materials and equipment necessary to accomplish this purpose. If the Engineer determines that such work is defective or in conflict with the Contract Documents, the Contractor shall bear all expenses of such uncovering, exposure, observation, inspection or testing as well as satisfactory reconstruction. If such work is found not to be defective, the Contractor shall be allowed an increase in Contract Price or an extension of Contract Time or both, attributable to such uncovering, exposure, observation, and inspection. An appropriate Change Order shall be prepared and issued by the Engineer.

10. SUBSTITUTIONS

Whenever a material, article or equipment is identified on the Drawings or in the Specifications by brand name, manufacturer's name or catalog number, it shall be understood that such reference is for defining the performance, requirements, quality, capacity and other salient features of that being specified. The Contractor may recommend substitution, by brand name or catalog number, for materials, articles, or equipment provided it is of equal substance and function to that referred to in the Contract Documents. If, in the opinion of the Engineer, recommended alternates are of equal substance, function and capacity as that specified, the Engineer may approve the substitution and use by the Contractor. Any cost differential shall be adjusted in the Contract Price and the Contract Documents shall be modified by a Change Order. The Contractor shall warrant that if substitutions are approved, no major changes in function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute requested by the Contractor, shall be made by the Contractor without a change in Contract Time or Contract Price.

11. PATENTS

11.1 The Contractor shall hold and save the Owner and its officers, agents and employees harmless, from liability of any type, including cost and expenses for or on account of, any patented or unpatented inventions, process, or article manufactured and used in the performance of the Work and its intended use thereafter, unless otherwise stipulated in the Contract Documents.

11.2 If the Contractor uses any device, materials or designs covered by patent, copyright or letters, he shall provide for such use by obtaining a suitable agreement with the Owner of such patented or copyrighted material, device or design. It shall be understood and agreed by the Contractor that, without exception, the Contract Price shall include all royalties or costs arising from the use of such materials, devices and designs used in the Work. The Contractor or his Sureties shall indemnify and save harmless the Owner from any and all claims for infringement by reason of use of such patented or copyrighted device, materials, or design or any trademark in connection with the Work to be performed within the scope of the Contract Documents and shall indemnify the Owner for any costs, expenses or damage which by reason of infringement may be due and payable after completion of the Work.

12. SURVEYS, PERMITS, AND REGULATIONS

- 12.1 Land surveys and/or base lines for locating principal structures associated with the Project together with a suitable number of bench marks near the Work site will be furnished by the Owner and shown in the Contract Documents. Utilizing information provided by the Owner, the Contractor shall develop all detail surveys needed for construction, unless specified otherwise in the Contract Documents, including but not limited to slope stakes, batter boards, stakes for pile location, working points, line elevations and cut sheets.
- 12.2 The Contractor shall assure preservation of bench marks, and other reference points. In the event of willful or careless destruction, he shall be charged with the resulting expense and shall be held responsible for any errors or mistakes resulting from such loss of bench marks or other reference points.
- 12.3 Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor unless otherwise stated in the Supplemental General Conditions or Special Conditions Permits, licenses and easements for permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 15, Changes In Work.

13. PROTECTION OF WORK, PROPERTY AND PERSONS

- 13.1 The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

13.2 The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused directly or indirectly in whole or in part by the Contractor, and subcontractor or anyone for whose acts any of them be liable.

13.3 In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Owner, shall act to prevent threatened damage, injury or loss. He will give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

14. CONTRACTOR'S OBLIGATION FOR SUPERVISION

The Contractor will supervise and direct the Work. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

15. CHANGES IN WORK

15.1 The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.

15.2 The Engineer, also, may at any time, by issuing a Field Order, make changes in the details of the Work. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer unless the Contractor believes that such Field Order entitles him to a change in Contract Price or Time or both, in which event he shall give the Engineer written notice thereof within seven (7) days after receipt of the ordered change. Thereafter, the Contractor shall document the basis for the change in Contract Price or Time within thirty (30) days. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the Owner.

16. CHANGES IN CONTRACT PRICE

The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be negotiated and determined by one or more of the following methods in the order of precedence listed below:

- (a) An agreed lump sum
- (b) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the Work to cover the cost of general overhead and profit.

17. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

17.1 The date of beginning and the time for completion of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed.

17.2 The Contractor will proceed with the Work at such a rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed by and between the Contractor and the Owner that the Contract Time for the completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work.

17.3 If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages as specified in the Bid for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

17.4 The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to the following and the Contractor has within seven calendar days given Written Notice of such delay to the Owner or Engineer.

17.4.1 To any preference priority or allocation order duly issued by the Owner.

17.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the Contractor including but not restricted to acts of God or of the public enemy, acts of the Owner, acts of another Contractor in the performance of contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather.

17.4.3 To any delays of Subcontractors occasioned by any of the causes specified in paragraphs 17.4.1 and 17.4.2 of this article.

18. CORRECTION OF WORK

18.1 The Contractor shall promptly remove from the premises all Work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Owner and shall bear the expense of making good all Work of other Contractors destroyed or damaged by such removal or replacement.

18.2 All removal and replacement Work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected Work within ten (10) days after receipt of Written Notice, the Owner may remove such Work and store the materials at the expense of the Contractor.

19. SUBSURFACE CONDITIONS

19.1 The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Owner by Written Notice of:

19.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents: or

19.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

19.2 The Owner shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, and equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required Written Notice; provided that the Owner may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

19.3 Information such as rock soundings or soil borings shown on the plans depicting subsurface conditions are thought to be representative but cannot be guaranteed accurate. It is the Contractor's responsibility to make any additional investigations necessary to ascertain or verify subsurface conditions. If subsurface conditions different from those indicated on the plans are encountered during construction, there will be no increase in Contract Price unless provided by unit prices listed on the Bid Form or by Change Order.

20. SUSPENSION OF WORK, TERMINATION AND DELAY =

20.1 The Owner may suspend the Work or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor and the Engineer. Such Written Notice shall fix the date on which Work shall be resumed. The Contractor will resume that Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

20.2 If the Contractor is adjudged as bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to subcontractors or for labor, materials, equipment, or if he disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction of the Work

or if he disregards the authority of the Engineer, or if he otherwise violates any provision of the Contract Documents, then the Owner may, without prejudice to any other right or remedy and after giving the Contractor and his Surety a minimum of ten (10) days from delivery of a Written Notice, terminate the services of the Contractor and take possession of the Project and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor, and finish the Work by whatever method he may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the Owner. Such cost incurred by the Owner will be determined by the Engineer and incorporated in a Change Order.

- 20.3 Where the Contractor's services have been so terminated by the Owner, said termination shall not affect any right of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Owner due the Contractor will not release the Contractor from compliance with the Contract Documents.
- 20.4 After ten (10) days from delivery of a Written Notice to the Contractor and the Engineer, the Owner may without cause and without prejudice to any other right or remedy, elect to abandon the Project and terminate the Contract. In such case, the Contractor shall be paid for all Work executed and any expense sustained plus reasonable profit.
- 20.5 If through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) days by the Owner or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days of its approval and presentation, then the Contractor may, after ten (10) days from delivery of a Written Notice to the Owner and the Engineer, terminate the Contract and recover from the Owner payment for all Work executed and all expenses sustained. In addition and in lieu of terminating the Contract, if the Engineer has failed to act on a request for payment or if the Owner has failed to make any payment as aforesaid, the Contractor may upon ten (10) days Written Notice to the Owner and the Engineer, stop the Work until he has been paid all amounts then due, in which event and upon resumption of the Work, Change Orders shall be issued for adjusting the Contract Price

or extending the Contract Time or both to compensate for the costs and delays attributable to the stoppage of the Work.

20.6 In the event that the Owner or Engineer determine that the Work is not being done in accordance with the Contract Documents, including, but not limited to, the fact that the Contractor does not have adequate supervision on site in accordance with Section 14 (Contractor's Obligation For Supervision) of these General Conditions, the Contractor may be ordered to stop work until he is in compliance with the Contract Documents without an increase in contract amount or time for completion.

21. PAYMENTS TO CONTRACTOR

21.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Owner's title to the material and equipment and protect his interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Owner, or return the partial payment estimate to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Owner will, within ten (10) days of presentation to him of an approved partial payment estimate, or at an earlier date if the Owner has received federal reimbursement funds to cover the payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Owner shall retain ten (10) percent of the amount of each payment until 50% of the work is completed at which time the retainage may be reduced to 5% if satisfactory progress is being made. When the Work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full,

including retained percentages, less authorized deductions.

- 21.2 The request for payment may also include all allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.
- 21.3 Prior to Substantial Completion, the Owner with the approval of the Engineer and with the concurrence of the Contractor, may use any completed or substantially completed portions of the Work.
- 21.4 Performance of related work on the premises by the Owner or use of partially completed portions of the Work by the Owner shall in no way be construed as relieving the Contractor of the sole responsibility for completing all Work in accordance with the Contract Documents, for care and protection of the Work, and for restoration of any damaged Work except such as may be caused by agents or employees of the Owner.
- 21.5 Upon completion and acceptance of the Work, the Engineer shall issue a certificate attached to the final payment request that the Work has been accepted by him under the conditions of the Contract Documents, the entire balance found to be due the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the Owner, shall be paid to the Contractor within thirty (30) days of completion and acceptance of the Work.
- 21.6 The Contractor will indemnify and save the Owner or the Owner's agents harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, furnishers of materials and machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the request of the Owner, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the Contractor fails to do so the Owner may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Owner shall be considered as a payment made under the Contract Documents

by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

22. PAYMENTS BY CONTRACTOR

The Contractor shall pay: (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of 90% of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the Project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the Work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his Subcontractors, not later than the 15th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the Work performed by his Subcontractors to the extent of each Subcontractor's interest therein.

23. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done or furnished in connection with this Work and for every act and neglect of the Owner and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents of the Performance Bond and Payment Bonds.

24. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

24.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the Work, whether such execution be by himself or by an Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

24.1.1 Claims under workmen's compensations, disability benefit and other similar employee benefit acts;

24.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

- 24.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- 24.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained: (a) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (b) by any other person; and
- 24.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.
- 24.2 All insurance to be procured and maintained by Contractor pursuant to this Contract shall be with Best A-rated companies acceptable to Owner, and certificates evidencing such insurance acceptable to Owner shall be filed with the Owner prior to commencement of the work. These certificates shall contain a provision that coverages afforded under the policies shall not be canceled unless at least fifteen (15) days prior written notice has been given to Owner. Owner shall be named as an additional insured on all said policies of insurance.
- 24.3 The Contractor shall procure and maintain, at his own expense during the Contract Time, liability insurance as hereinafter specified.
- 24.3.1 Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Contractor and protecting him from all claims for destruction of or damage to property arising out of or in connection with any operations under the Contract Documents, whether such operations be by himself or by any Subcontractor under him, or anyone directly or indirectly employed by the Contractor or by a Subcontractor under him. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$1,000,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$3,000,000 aggregate for any damages arising out of bodily injury, including death at any time resulting therefrom sustained by two or more persons in any one accident.

24.3.2 The Contractor shall acquire and maintain, Fire and Extended Coverage Insurance upon the Project to the full insurable value thereof for the benefits of the Owner, the Contractor, and the Subcontractors as their interest may appear. This provision shall in no way release the Contractor or Contractor's Surety from obligations under the Contract Documents to fully complete the Project.

24.4 The Contractor shall procure and maintain, at his own expense, during the Contract Time, in accordance with the provisions of the laws of the state in which the Work is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the Project. In case of any work sublet, the Contractor shall require such Subcontractor similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous work under this contract at the site of the Project is not protected under Workmen's Compensation statute, the Contractor shall provide, and shall cause each Subcontractor to provide adequate and suitable insurance for the protection of his employees not otherwise protected.

24.5 The Contractor shall secure, "All Risk" type Builder's Risk Insurance of Work to be performed. Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the Contract Price totaled in the Bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the Contract Time, and until the Work is accepted by the Owner. The policy shall name as the insured, the Contractor, the Engineer, and the Owner. If the Builder's Risk Insurance excludes flood damage, the Contractor shall be required to secure the maximum amount of Federal Flood Insurance available for the Contract.

25. CONTRACT SECURITY

The Contractor shall within ten (10) days after receipt of the Notice of Award furnish the Owner with a Performance Bond and a Payment Bond in penal sums equal to the amount of the Contract Price conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions, and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the

Contractor and all corporate bonding company licensed to transact such business in the State where the Work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the Contractor If at any time a surety on any such Bond is declared bankrupt or loses its right to do business in the State in which the Work is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable Bond, (or Bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such Bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable Bond to the Owner.

26. ASSIGNMENTS

Neither the Contractor nor the Owner shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

27. INDEMNIFICATION

27.1 The Contractor will indemnify and hold harmless the Owner and the Engineer and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury or to destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

27.2 In any and all claims against the Owner or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under Workmen's Compensation Acts, disability benefit acts or other employee benefits acts.

36. QUANTITIES OF ESTIMATES

Whenever the estimated quantities of Work to be done and materials to be furnished on a unit price basis under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids, and the right is expressly reserved, except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the Work contemplated by this contract, and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

37. CONFLICTING CONDITIONS

Any provision in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or inconsistency.

38. NOTICE AND SERVICE THEREOF

Any notice of any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted by certified or registered mail, to the said Contractor at his last given address, or delivered in person to said Contractor or his authorized representative on the Work.

39. REQUIRED PROVISIONS DEEMED INSERTED

39.1 Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either party, the contract shall forthwith be physically amended to make such insertion or correction.

39.2 The Contractor agrees to abide by all local and state laws or ordinances to the extent that such requirements do not conflict with Federal Laws or regulations.

40. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION

In order to protect the lives and health of his employees under the contract, the Contractor shall comply with all pertinent provisions of the Contract Work Hours and Safety Standards Act as amended, and the Occupational Safety and Health Act of 1970 as amended, and shall maintain an accurate

record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from Work, arising out of and in the course of employment of Work under the Contract.

The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance, or operation. He shall provide safety controls for protection of life and health of employees. The Contractor shall comply with all safety regulations of the State Department of Labor.

41. LABOR STANDARDS

The Contractor shall comply with the appropriate prevailing wage rates applicable to this project; they are contained in the Wage Rate Section of these Specifications.

42. INTEREST OF FEDERAL, STATE OR LOCAL OFFICIALS

No federal, state or local official shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this contract if made with a corporation for its general benefit.

43. OTHER PROHIBITED INTEREST

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiation, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the Project, shall become directly or indirectly interested personally in this contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the Project, shall be come directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the Project.

44. EXISTING UTILITIES

44.1 Special precautions shall be taken by the Contractor to avoid damage to existing overhead and underground utilities owned and operated by the Owner or by public or private utility companies.

- 44.2 With particular respect to existing underground utilities, the available information concerning their location has been shown on the Drawings. While it is believed that the locations shown are reasonably correct, neither the Engineer nor the Owner can guarantee the accuracy or adequacy of this information.
- 44.3 Before proceeding with the Work, the Contractor shall confer with all public or private companies, agencies, or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference or conferences, shall be to notify said companies, agencies, or departments of the proposed construction schedule, verify the location of, and possible interference with, the existing utilities that are shown on the plans, arrange for necessary suspension of service and make arrangements to locate and avoid interference with all utilities (including house connections) that are not shown on the plans. The Engineer and Owner have no objection to the contractor arranging for the said utility companies, agencies, or departments to locate and uncover their own utilities; however, the Contractor shall bear the entire responsibility for locating and avoiding or repairing damage to said existing utilities.
- 44.4 When the Contractor encounters any utilities not shown on the plans or in different location than shown on the plans and in conflict with the Work, he shall immediately notify the Engineer.
- 44.5 It is suggested that the Contractor locate all unknown metallic hazards, namely buried pipe, metals, etc by using a pipe locator. The pipe locator shall immediately precede the trench ditching and all hazard located and marked in such manner as to notify the machine operator of such hazard.
- 44.6 Where existing utilities or appurtenant structures, either underground or aboveground, are encountered, they shall not be displaced or molested unless necessary, and in such case shall be replaced in as good or better condition than found as quickly as possible. The Contractor will make all necessary utility relocations unless otherwise noted. Where new water lines, gas lines, or sewers are being installed to replace existing lines, the Contractor shall maintain the existing lines in service until new lines are in service or shall provide temporary utility service to affected customers at his expense.
- 44.7 It is expected that the Contractor will be diligent in his efforts and use every possible means to locate existing utilities. Any claims for unavoidable damage,

based on improper or unknown locations, will be thoroughly examined in the light of the Contractor's efforts to locate the said utilities or obstructions prior to beginning construction.

45. STANDARD SPECIFICATIONS

Where standard specifications, such as those of the American Society for Testing Materials, the American Standards Association, the American Association of State Highway Officials, the Federal Aviation Agency, etc are referred to in the specifications and Contract Documents and on the plans, said references shall be construed to mean the latest amended and/or revised versions of the said standard or tentative specifications.

46. SANITARY FACILITIES

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen. As the needs arise, enclosed temporary toilets, in sufficient number, shall be placed as directed by the Engineer. Permanent toilets installed under this Contract shall not be used during construction. Drinking water shall be provided from an approved safe source, so piped or transported as to be kept clean and fresh, and served from single service containers of satisfactory types.

47. SUPERVISION OF INSTALLATION

All major equipment and control systems shall be installed under the supervision of a qualified installation Engineer and/or representative furnished by the manufacturer of such equipment or control system.

48. AIR AND WATER POLLUTION CONTROL

The Contractor shall provide all materials, equipment, devices and work required to comply with air and water standards and to accomplish construction of the Project in a manner which will protect, enhance, and retrieve a favorable environment. The Contractor, at all times, shall observe and comply with all federal, state, possession, and local laws, codes, ordinances, and regulations governing air and water pollution control and the Contractor and his surety shall indemnify and save harmless the Owner and all his officers, agents, and servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decrees, whether by himself or his employees. The Contractor shall bear all expense of meeting and maintaining air and water standards, and any accessory features incidental to compliance without additional or direct compensation, except as otherwise specified. The Contractor shall take appropriate actions to minimize situation and soil erosion,

control noise and limit odors during construction. No bypassing of wastewater will occur in conjunction with this contract without prior approval of the State Water Pollution Control Agency, and the United States Environmental Protection Agency.

49. USE OF CHEMICALS

All chemicals used during project construction or furnished for project operations, whether herbicide, pesticide, disinfectant, polymer, reactant, or of such classification, must show approval of either EPA or USDA. Use of all such chemicals shall be in conformance with instructions.

50. DAMAGE TO EXISTING LANDSCAPING, PAVEMENTS, STRUCTURES, SIDEWALKS, CURBS, ETC

The Contractor shall be responsible for replacing all lawns, trees, shrubs, fences, sidewalks, driveways, curbs, ditches, drainage structures, or other improvements both public and private which are damaged in carrying out the Work. Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing. Trees removed shall be replaced with trees of a like kind, 5'-6' in height as directed by the Engineer.

GENERAL CONDITIONS

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1. DEFINITIONS

1.1 Wherever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated and shall be applicable to both the singular and plural thereof:

1.2 ADDENDA - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the CONTRACT DOCUMENTS, DRAWINGS and SPECIFICATIONS, by additions, deletions, clarifications, or corrections.

1.3 BID - The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

1.4 BIDDER - Any person, firm, or corporation submitting a BID for the WORK.

1.5 BONDS - Bid, Performance, and Payment Bonds and other instruments of surety, furnished by the CONTRACTOR and the CONTRACTOR'S surety in accordance with the CONTRACT DOCUMENTS.

- 1.6 CHANGE ORDER - A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.
- 1.7 CONTRACT DOCUMENTS - The contract, including Advertisement For BIDS, Information For BIDDERS, BID, BID BOND, Agreement, Payment BOND, Performance BOND, NOTICE OF AWARD, NOTICE TO PROCEED, CHANGE ORDER, DRAWINGS, SPECIFICATIONS, and ADDENDA.
- 1.8 CONTRACT PRICE - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.
- 1.9 CONTRACT TIME - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
- 1.10 CONTRACTOR - The person, firm, or corporation with whom the OWNER has executed the Agreement.
- 1.11 DRAWINGS - The parts of the CONTRACT DOCUMENTS which show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.
- 1.12 ENGINEER - The person, firm, or corporation named as such in the CONTRACT DOCUMENTS.
- 1.13 FIELD ORDER - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.
- 1.14 NOTICE OF AWARD - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.
- 1.15 NOTICE TO PROCEED - Written communication issued by the OWNER to the CONTRACTOR authorizing him/her to proceed with the WORK and establishing the date for commencement of the WORK.
- 1.16 OWNER - A public or quasi-public body or authority, corporation, association, partnership, or an individual for whom the WORK is to be performed.
- 1.17 PROJECT - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.
- 1.18 RESIDENT PROJECT REPRESENTATIVE - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.

1.19 SHOP DRAWINGS - All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

1.20 SPECIFICATIONS - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards and workmanship.

1.21 SUBCONTRACTOR - An individual, firm, or corporation having a direct contract with CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.

1.22 SUBSTANTIAL COMPLETION - That date certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

1.23 SUPPLEMENTAL GENERAL CONDITIONS - Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.

1.24 SUPPLIER - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site.

1.25 WORK - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

1.26 WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at their last given address, or delivered in person to said party or their authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

2.2 The additional drawings and instructions thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS AND RECORDS

3.1 The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.

3.2 Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which the CONTRACTOR proposes to carry on the WORK, including dates at which the various parts of the WORK will be started, estimated date of completion of each part and, as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

3.3 The CONTRACTOR shall also submit a schedule of payments that the CONTRACTOR anticipates will be earned during the course of the WORK.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.

4.2 In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over general DRAWINGS.

4.3 Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

5.1 The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING which substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.

5.2 When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

5.3 Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by the manufacturer.

6.4 Materials, supplies, and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.

6.5 Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

7.2 The OWNER shall provide all inspection and testing services not required by the CONTRACT DOCUMENTS.

7.3 The CONTRACTOR shall provide at the CONTRACTOR'S expense the testing and inspection services required by the CONTRACT DOCUMENTS.

7.4 If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing or approval.

7.5 Inspections, tests, or approvals by the engineer or others shall not relieve the CONTRACTOR from the obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.

7.6 The ENGINEER and the ENGINEER'S representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records or personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection or testing thereof.

7.7 If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for the ENGINEER'S observation and replaced at the CONTRACTOR'S expense.

7.8 If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request, will uncover, expose or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, if, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS

8.1 Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue numbers, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME.

9. PATENTS

9.1 The CONTRACTOR shall pay all applicable royalties and license fees, and shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design, process or product specified is an infringement of a patent, the CONTRACTOR shall be responsible for such loss unless the CONTRACTOR promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pipe locations and other working points, lines, elevations and cut sheets.

10.2 The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense and shall be responsible for any mistake that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, the CONTRACTOR shall promptly notify the ENGINEER in writing, and any necessary changes shall be adjusted as provided in Section 13, CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The CONTRACTOR will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR will take all necessary precautions for the safety of, will provide the necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. The CONTRACTOR will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. The CONTRACTOR will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone directly or indirectly employed by any of them or anyone of whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER, of the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

11.3 In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instructions or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury or loss. The CONTRACTOR will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

13.1 The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.

13.2 The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles the CONTRACTOR to a change in CONTRACT PRICE or TIME, or both, in which event the CONTRACTOR shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

14.1 The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:

- a. Unit prices previously approved.
- b. An agreed lump sum.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

15.2 The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

15.3 If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.

15.4 The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.

15.4.1 To any preference, priority or allocation order duly issued by the OWNER.

15.4.2 To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

15.4.3 To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

15. CORRECTION OF WORK

16.1 The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and reexecute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.

16.2 All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

17.1 The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:

17.1.1 Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or

17.1.2 Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

17.2 The OWNER shall promptly investigate the conditions, and if it is found that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless the required WRITTEN NOTICE has been given; provided that the OWNER may, if the OWNER determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION, AND DELAY

18.1 The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR, by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

18.2 If the CONTRACTOR is adjudged a bankrupt or insolvent, or makes a general assignment for the benefit of its creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of its property, or if CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials or equipment or disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK or disregards the authority of the ENGINEER, or otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and its surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method the OWNER may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

18.3 Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

18.4 After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.

18.5 If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until paid all amounts then due, in which event and upon resumption of the WORK CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

18.6 If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENT TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect the OWNER'S interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing approval of payment, and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing the reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate less the retainage. The retainage shall be an amount equal to 5% of said estimate. If at any time thereafter when the progress of the WORK is not satisfactory, additional amounts may be retained. Upon substantial completion of the work, any amount retained may be paid to the CONTRACTOR. When the WORK has been substantially completed except for WORK which cannot be completed because of weather conditions, lack of materials or other reasons which in the judgment of the OWNER are valid reasons for noncompletion, the OWNER may make additional payments, retaining at all times an amount sufficient to cover the estimated cost of the WORK still to be completed.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

19.4 The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

19.5 Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.

19.6 The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demand of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the CONTRACTOR shall be resumed in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, the CONTRACTOR'S Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

19.7 If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1 The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or its sureties from any obligations under the CONTRACT DOCUMENTS or the Performance and Payment BONDS.

21. INSURANCE

21.1 The CONTRACTOR shall purchase and maintain such insurance as will protect it from claims set forth below which may arise out of, or result from, the CONTRACTOR'S execution of the WORK, whether such execution be by the CONTRACTOR, any SUBCONTRACTOR, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

21.1.1 Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

21.1.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of employees;

21.1.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than employees;

21.1.4 Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and

21.1.5 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.

21.3 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, Liability insurance as hereinafter specified:

21.3.1 CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting the CONTRACTOR from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by the CONTRACTOR or by any SUBCONTRACTOR employed by the CONTRACTOR or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR employed by the CONTRACTOR. Insurance shall be written with a limit of liability of not less than \$500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$200,000 aggregate for any such damage sustained by two or more persons in any one accident.

21.3.2 The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

21.4 The CONTRACTOR shall procure and maintain, at the CONTRACTOR'S own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the WORK is performed, Workmen's Compensation Insurance, including occupational disease provisions, for all of the CONTRACTOR'S employees at the site of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of its employees not otherwise protected.

21.5 The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, and the OWNER.

22. CONTRACT SECURITY

22.1 The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance BOND and a Payment BOND in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the list of Surety Companies accepted on Federal Bonds, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further payment shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of any right, title or interest therein, or any obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.

24.3 The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, its agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

25. SEPARATE CONTRACTS

25.1 The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate the WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

25.2 The OWNER may perform additional WORK related to the PROJECT or the OWNER may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if the OWNER is performing the additional WORK) reasonable opportunity for the introduction and storage of materials and equipment and the execution of WORK, and shall properly connect and coordinate the WORK with theirs.

25.3 If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves it in additional expense or entitles it to an extension of the CONTRACT TIME, the CONTRACTOR may make a claim thereof as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The CONTRACTOR may utilize the services of specialty SUBCONTRACTS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.

26.2 The CONTRACTOR shall not award WORK to SUBCONTRACTOR(s), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.

26.3 The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of its SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as the CONTRACTOR is for the acts and omissions of persons directly employed by the CONTRACTOR.

26.4 The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

26.5 Nothing contained in this CONTRACT shall create any contractual relationship between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

27.1 The ENGINEER shall act as the OWNER'S representative during the construction period, shall decide questions which may arise as to quality and acceptability of materials furnished and WORK performed, and shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

27.2 The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship, and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.

28.2 The OWNER shall provide to the CONTRACTOR information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The CONTRACTOR shall provide at its own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTEE

29.1 The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period.

30. ARBITRATION BY MUTUAL AGREEMENT

30.1 All claims, disputes, and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims which have been waived by making an acceptance of final payment as provided by Section 20, may be decided by arbitration if the parties mutually agree. Any agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the request for arbitration shall be filed in writing with the other party to the CONTRACT DOCUMENTS and a copy shall be filed with the ENGINEER. Request for arbitration shall in no event be made on any claim, dispute, or other matter in question which would be barred by the applicable statute of limitations.

30.3 The CONTRACTOR will carry on the WORK and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The CONTRACTOR will pay all sales, consumer, use, and other similar taxes required by the laws of the place where the WORK is performed.

32. ENVIRONMENTAL REQUIREMENTS

The CONTRACTOR, when constructing a project involving trenching and/or other related earth excavation, shall comply with the following environmental constraints.

32.1 WETLANDS - The CONTRACTOR, when disposing of excess, spoil, or other construction materials on public or private property, WILL NOT FILL IN or otherwise CONVERT WETLANDS.

32.2 FLOODPLAINS - The CONTRACTOR, when disposing of excess, spoil, or other construction materials on public or private property, WILL NOT FILL IN or otherwise CONVERT 100 YEAR FLOODPLAIN areas delineated on the latest FEMA Floodplain Maps.

32.3 HISTORIC PRESERVATION - Any excavation by the Contractor that uncovers an historical or archaeological artifact shall be immediately reported to the PROJECT ENGINEER and a representative of RUS. Construction shall be temporarily halted pending the notification process and further directions issued by RUS after consultation with the State Historic Preservation Officer (SHPO).

32.4 ENDANGERED SPECIES - The CONTRACTOR shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of the CONTRACTOR, the CONTRACTOR will immediately report this evidence to the PROJECT ENGINEER and a representative of RUS. Construction shall be temporarily halted pending the notification process and further directions issued by RUS after consultation with the U.S. Fish and Wildlife Service.

RUS Supplemental General Conditions

The provisions of the Rural Utilities Service (RUS) Supplemental General Conditions as described herein change, amend, or supplement the General Conditions and shall supersede any conflicting provisions of this CONTRACT. All provisions of the General Conditions which are not changed, amended, or supplemented, remain in full force.

- | | |
|-------------------------------------|--|
| 1. CONTRACT APPROVAL | 9. SMALL, MINORITY AND WOMEN'S BUSINESSES |
| 2. CONTRACT CHANGE ORDERS | 10. ANTI-KICKBACK |
| 3. PARTIAL PAYMENT ESTIMATES | 11. VIOLATING FACILITIES |
| 4. CONFLICT OF INTEREST | 12. STATE ENERGY POLICY |
| 5. PROTECTION OF LIVES AND PROPERTY | 13. EQUAL OPPORTUNITY REQUIREMENTS |
| 6. REMEDIES | 14. CERTIFICATE OF OWNER'S ATTORNEY |
| 7. GRATUITIES | 15. RUS CONCURRENCE |
| 8. AUDIT AND ACCESS TO RECORDS | |

1. Contract Approval.

1.1 The OWNER and the CONTRACTOR will furnish the OWNER'S Attorney such evidence as required so that the OWNER'S Attorney can complete and execute "Certificate of Owner's Attorney" (Section 14) before the OWNER submits the executed Contract Documents to RUS for approval.

1.2 Concurrence by the State Program Official or designee in the award of the CONTRACT is required before it is effective and the "RUS Concurrence" (Section 15), shall be attached and made a part of the Agreement.

1.3 Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located. [Revision 1, 07/11/1997]

1.4 This CONTRACT is expected to be funded in part with funds from the RUS. Neither the United States nor any of its departments, agencies, or employees is or will be a party to this CONTRACT or any SUBCONTRACT.

2. Contract Change Orders.

2.1 All changes affecting the project's construction cost or modifications of the terms or conditions of the contract must be authorized by means of a written contract change order which is mutually agreed to by the OWNER and CONTRACTOR and is approved by RUS. The contract change order will include extra work, work for which quantities have been altered from those shown in the bidding schedule, as well as decreases or increases in the quantities of installed units which are different than those shown in the bidding schedule because of final measurements. All changes must be recorded on a contract change order before they can be included in a partial payment estimate.

2.2 FORM RD 1924-7, "Contract Change Order" or similar form approved by RUS shall be used to record CONTRACT changes.

2.3 When the CONTRACT sum is, in whole or in part, based on unit prices, the OWNER reserves the right to increase or decrease a unit price quantity as may be deemed reasonable or necessary in order to complete the work contemplated by this CONTRACT.

3. Partial Payment Estimates.

3.1 FORM RD 1924-18, "Partial Payment Estimate," or similar form approved by RUS shall be used when estimating periodic payments due the CONTRACTOR.

3.2 The OWNER may after consultation with the ARCHITECT/ENGINEER withhold or, on account of subsequently discovered evidence, nullify the whole or part of any approved partial payment estimate to such extent as may be necessary to protect the OWNER from loss on account of:

3.2.1 Defective work not remedied.

3.2.2 Claims filed.

3.2.3 Failure of CONTRACTOR to make payments properly to subcontractors or suppliers.

3.2.4 A reasonable doubt that the WORK can be completed for the balance then unpaid.

3.2.5 Damage to another CONTRACTOR.

3.2.6 Performance of WORK in violation of the terms of the CONTRACT DOCUMENTS.

3.3 Where WORK on unit price items is substantially complete but lacks testing, clean-up and/or corrections, amounts shall be deducted from unit prices in partial payment estimates to amply cover such testing, clean-up and/or corrections.

3.4 When the items in 3.2 and 3.3 are cured, payment shall be made for amounts withheld because of them.

3.5 Payments will not be made that would deplete the retainage nor place in escrow any funds that are required for retainage nor invest the retainage for the benefit of the CONTRACTOR.

4. Conflict of Interest.

4.1. Unacceptable bidders. An ENGINEER (individual or firm including persons they employ) who has prepared plans and specifications will not be considered an acceptable bidder. Any firm or corporation in which such ENGINEER (including persons they employ) is an officer, employee, or holds or controls a substantial interest will not be considered an acceptable bidder. Contracts or purchases by the CONTRACTOR shall not be awarded or made to a supplier or manufacturer if the ENGINEER (firm or individual) who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Sids will not be awarded to firms or corporations which are owned or controlled wholly or in part by a member of the governing body of the OWNER or to an individual who is such a member.

4.2. The OWNER'S officers, employees, or agents shall not engage in the award or administration of this CONTRACT if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (a) the employee, officer or agent; (b) any member of their immediate family; (c) their partner or (d) an organization which employs, or is about to employ, any of the above has financial or other interest in the CONTRACTOR. The OWNER'S officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from the CONTRACTOR or subcontractor.

5. Protection of Lives and Property

5.1 In order to protect the lives and health of its employees under the CONTRACT, the CONTRACTOR shall comply with all pertinent provisions of the Occupational Safety and Health Administration (OSHA) and any State Safety and Health agency requirements.

5.2 The CONTRACTOR alone shall be responsible for the safety, efficiency, and adequacy of its plant, appliances, and methods, and for any damage which may result from their failure or their improper construction, maintenance or operation.

6. Remedies. Unless otherwise provided in this CONTRACT, all claims, counterclaims, disputes, and other matters in question between the OWNER and the CONTRACTOR arising out of or relating to this CONTRACT or the breach thereof will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State in which the OWNER is located.

6.1 The arbitration provisions of this section may be initiated by either party to this CONTRACT by filing with the other party and the ENGINEER a WRITTEN REQUEST for arbitration.

6.2 Each party to this CONTRACT will appoint one arbitrator; the two arbitrators will select a third arbitrator.

6.3 The arbitrators will select a hearing location as close to the OWNER'S locale as possible.

6.4 The procedure for conducting the hearings will follow the Construction Industry Arbitration Rules of the American Arbitration Association.

7. Gratuities.

7.1 If the OWNER finds after a notice and hearing that the CONTRACTOR, or any of the CONTRACTOR'S agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the OWNER, the State, or RUS officials in an attempt to secure this CONTRACT or favorable treatment in awarding, amending, or making any determinations related to the performance of this CONTRACT, the OWNER may, by written notice to the CONTRACTOR, terminate this CONTRACT. The OWNER may also pursue other rights and remedies that the law or this CONTRACT provides. However, the existence of the facts on which the OWNER bases such findings shall be an issue and may be reviewed in proceedings under the Remedies clause of this CONTRACT.

7.2 In the event this CONTRACT is terminated as provided in paragraph 7.1 the OWNER may pursue the same remedies against the CONTRACTOR as it could pursue in the event of a breach of the CONTRACT by the CONTRACTOR. As a penalty, in addition to any other damages to which it may be entitled by law, the OWNER may pursue exemplary damages in an amount (as determined by the OWNER) which shall be not less than three nor more than ten times the costs the CONTRACTOR incurs in providing any such gratuities to any such officer or employee.

8. Audit and Access to Records. For all negotiated contracts (except those of \$10,000 or less), the RUS, the Comptroller General, the OWNER or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the CONTRACTOR, which are pertinent to the CONTRACT, for the purpose of making audits, examinations, excerpts and transcriptions. The CONTRACTOR shall maintain all required records for three years after final payment is made and all other pending matters are closed.

9. Small, Minority and Women's Businesses. If the CONTRACTOR intends to let any subcontracts for a portion of the work, the CONTRACTOR shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services.

10. Anti-Kickback. The CONTRACTOR shall comply with the Copeland Anti-Kickback Act (18 USC 874) as supplemented in Department of Labor regulations (29 CFR, Part 3). This act provides that each CONTRACTOR shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. The OWNER shall report all suspected or reported violations to RUS.

11. Violating Facilities. Where this CONTRACT exceeds \$100,000 the CONTRACTOR shall comply with all applicable standards, orders or requirements issued under section 306 of the Clean Air Act (42 U.S.C. 1857(h)), section 508 of the Clean Water Act (33 U.S.C. 1368), Executive Order 11738, and Environmental Protection Agency regulations 40 CFR Part 15 which prohibit the awarding of non-exempt federal contracts, grants, or loans to facilities included on EPA's list of violating facilities. The CONTRACTOR will report violations to the EPA.

12. State Energy Policy. The CONTRACTOR shall comply with the Energy Policy and Conservation Act (P.L. 94-163). Mandatory standards and policies relating to energy efficiency, contained in the State Energy Conservation Plan, shall be utilized.

13. Equal Opportunity Requirements. For all contracts in excess of \$10,000, the CONTRACTOR shall comply with Executive Order 11246, entitled "Equal Employment Opportunity," as amended by Executive Order 11375, and as supplemented in Department of Labor regulations (41 CFR Part 60).

13.1 If the CONTRACT exceeds \$10,000, the CONTRACTOR will execute Form RD 400-6, "Compliance Statement."

13.2 The CONTRACTOR'S compliance with Executive Order 11246 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the Standard Federal Equal Employment Opportunity Construction Contract Specifications, as set forth in 41 CFR Part 60-4 and its efforts to meet the goals established for the geographical area where the CONTRACT is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the CONTRACT, and in each trade, and the CONTRACTOR shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the CONTRACTOR'S goals shall be a violation of the CONTRACT, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

13.3 The CONTRACTOR shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the CONTRACT resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number; estimated dollar amount of subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the CONTRACT is to be performed.

14. Certificate of Owner's Attorney.

I, the undersigned, _____, the duly authorized and acting legal representative of _____, do hereby certify as follows

I have examined the attached contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements are adequate and have been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Date: _____

NOTE: Delete phrase "performance and payment bonds" when not applicable.

15. RUS Concurrence.

As lender or insurer of funds to defray the costs of this contract, and without liability for any payments thereunder, the Rural Utilities Service (RUS) hereby concurs in the award of this CONTRACT to

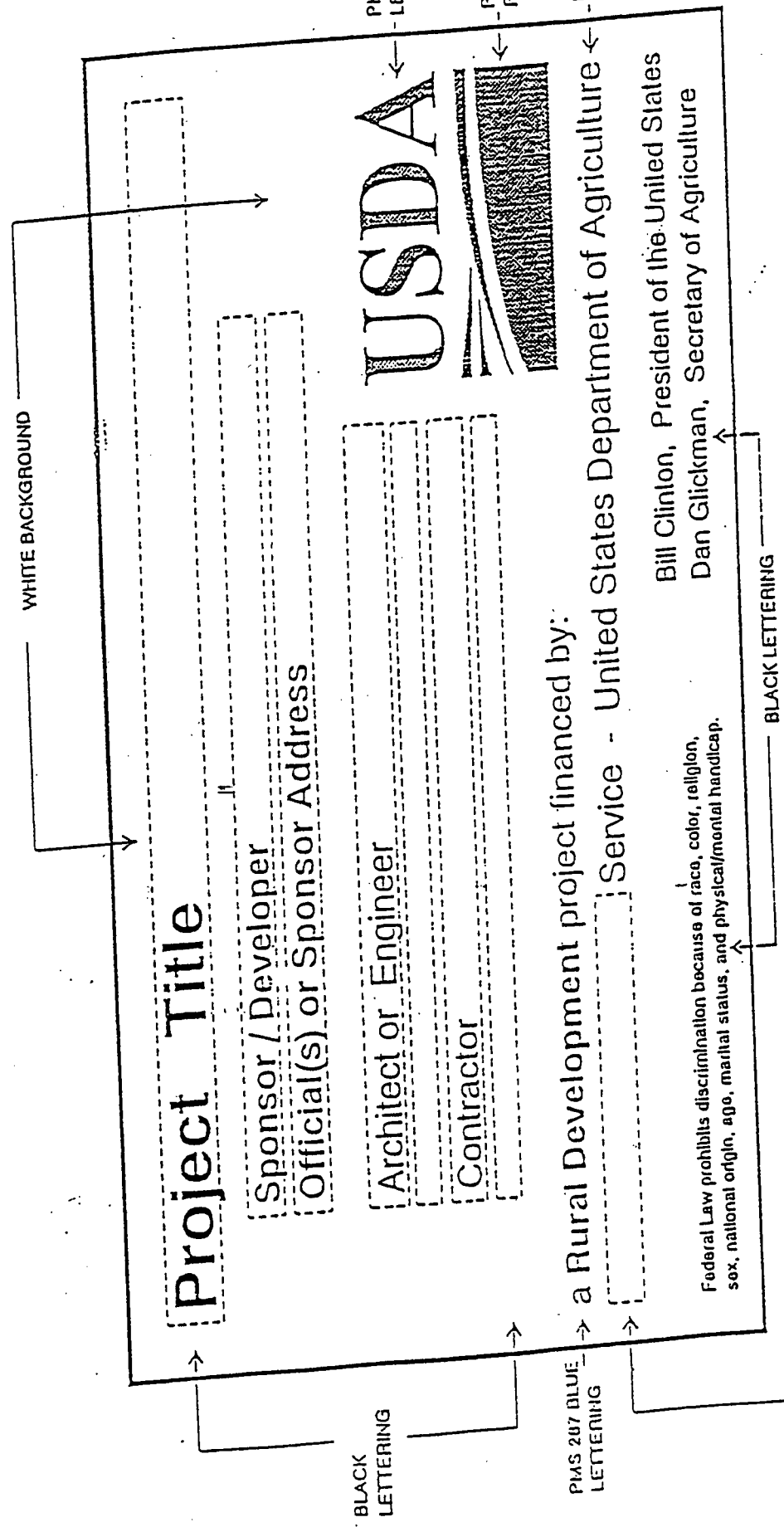
U.S. Department of Agriculture
Rural Utilities Service

By _____ Title _____

Date _____

This CONTRACT shall not be effective unless and until concurred in by the State Program Official of the Rural Utilities Service, U.S. Department of Agriculture or a delegated representative.

construction sign for **RURAL DEVELOPMENT** projects:



INSERT
 Rural Housing,
 Rural Utilities, or
 Rural Business-Cooperative
 (PMS 343 GREEN)

SIGN DIMENSIONS: 1200mm x 2400mm x 19mm (approx. 4' x 8' x 3/4")
 PLYWOOD PANEL (APA RATED A-B GRADE - EXTERIOR)

PAUL E. PATTON
GOVERNOR



VISION OF EMPLOYMENT STANDARDS,
APPRENTICESHIP AND TRAINING

JOE NORSWORTHY
SECRETARY

LABOR CABINET
1047 U S HWY 127 S STE 4
FRANKFORT KY 40601-4381

DENNIS J. LANGFORD
DIRECTOR

March 25, 1999

RECEIVED LC

MAR 29 1999 JEM

Mr. Larry Cann
HMB, Inc.
3 HMB Circle
Frankfort, Kentucky 40601

Haworth, Meyer & Boleyn

Re: Jessamine County Water District #1
1,000,000 Gallon Elevated Water Storage Tank

Advertising Date as Shown on Notification: April 8, 1999

Dear Mr. Cann:


This office is in receipt of your written notification on the above project as required by KRS 337.510(1).

I am enclosing a copy of the current prevailing wage determination number CR-0-283, dated January 5, 1998, for Jessamine County. This schedule of wages shall be attached to and made a part of the specifications for the work, printed on the bidding blanks, and made a part of the contract for the construction of the public works between the public authority and the successful bidder or bidders.

The determination number assigned to this project is based on the date contained in your notification as the date the project is advertised for bids. If this is changed in any way, it will be the responsibility of the public authority to contact this office and reascertain the correct schedule of the prevailing rates of wages.

Your project number is as follows: 113-2-0021-98-0

Respectfully,


Dennis J. Langford
Director

lprh

Enclosure

TELEPHONE: (502) 564-2784

An Equal Opportunity Employer M/F/D



LR-1

COMMISSIONER'S CURRENT REVISION
KENTUCKY PREVAILING WAGE DETERMINATION
SENATORIAL DISTRICT NO. 022

NOTICE

Determination No. CR-0-283

THIS DETERMINATION APPLIES TO

Date of Determination: January 5, 1998

PROJECT NO. 113-2-0021-98-0

This schedule of the prevailing rate of wages for Senatorial District No. 022, which includes Anderson, Boyle, Jessamine and Mercer Counties, has been determined in accordance with the provisions of KRS 337.505 to 337.550. This determination shall be referred to as Prevailing Wage Determination No. CR-0-283.

Apprentices or trainees shall be permitted to work as such subject to Administrative Regulations adopted by the Commissioner of Workplace Standards. Copies of these regulations will be furnished upon request to any interested person.

Overtime is to be computed at not less than one and one-half (1 1/2) times the indicated BASE RATE for all hours worked in excess of eight (8) per day, or in excess of forty (40) per week. However, KRS 337.540 permits an employee and employer to agree, in writing, that the employee will be compensated at a straight time base rate for hours worked in excess of eight (8) hours in any one workday, but not more than ten (10) hours worked in any one workday, if such written agreement is prior to the over eight (8) hours in a workday actually being worked, or where provided for in a collective bargaining agreement. The fringe benefit rate is to be paid for each hour worked at a straight time rate for all hours worked.

No laborer, workman or mechanic shall be paid at a rate less than that of the General Laborer except those classified as bona fide apprentices registered with the Kentucky State Apprenticeship Supervisor unless otherwise specified in this schedule of wage rates.

Fringe benefit amounts are applicable for all hours worked except when otherwise noted.

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

ASBESTOS/INSULATION WORKERS

BASE RATE \$19.75
FRINGE BENEFITS 5.26

BOILERMAKERS

BASE RATE \$21.75
FRINGE BENEFITS 10.76

BRICKLAYERS:

Bricklayers, Masons, Concrete Blocklayers, Pointers, Cleaners & Caulkers

BASE RATE \$16.33
FRINGE BENEFITS 3.68

Refractory

BASE RATE \$16.83
FRINGE BENEFITS 3.68

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

BRICKLAYERS: (Continued)

| | | | |
|--------------------|--|-----------------|---------|
| Layoutmen & Sawmen | | BASE RATE | \$16.58 |
| | | FRINGE BENEFITS | 3.68 |

CARPENTERS:

| | | | |
|------------|----------|-----------------|---------|
| Carpenters | BUILDING | BASE RATE | \$15.17 |
| | | FRINGE BENEFITS | 4.14 |

| | | | |
|--|-----------------|-----------------|---------|
| | HEAVY & HIGHWAY | BASE RATE | \$17.95 |
| | | FRINGE BENEFITS | 4.68 |

| | | | |
|--------|-----------------|-----------------|---------|
| Divers | HEAVY & HIGHWAY | BASE RATE | \$27.30 |
| | | FRINGE BENEFITS | 4.68 |

| | | | |
|-------------|----------|-----------------|---------|
| Piledrivers | BUILDING | BASE RATE | \$15.67 |
| | | FRINGE BENEFITS | 4.14 |

| | | | |
|--|-----------------|-----------------|---------|
| | HEAVY & HIGHWAY | BASE RATE | \$18.20 |
| | | FRINGE BENEFITS | 4.68 |

| | | | |
|---------------|----------|-----------|---------|
| CEMENT MASONS | BUILDING | BASE RATE | \$14.00 |
|---------------|----------|-----------|---------|

| | | | |
|--------------|--|-----------------|--------------------|
| ELECTRICIANS | | BASE RATE | \$19.70 |
| | | FRINGE BENEFITS | 5.40 + |
| | | | 4 1/4% gross wages |

| | | | |
|-----------------------|--|-----------------|---------|
| ELEVATOR CONSTRUCTORS | | BASE RATE | \$15.54 |
| | | FRINGE BENEFITS | 1.64 |

| | | | |
|------------------------------|--|-----------------|--------|
| ELEVATOR CONSTRUCTOR HELPERS | | BASE RATE | \$8.22 |
| | | FRINGE BENEFITS | 1.17 |

| | | | |
|----------|--|-----------|---------|
| GLAZIERS | | BASE RATE | \$10.00 |
|----------|--|-----------|---------|

| | | | |
|-------------|--|-----------------|---------|
| IRONWORKERS | | BASE RATE | \$19.31 |
| | | FRINGE BENEFITS | 9.25 |

LABORERS:

General laborers, asbestos abatement laborer, toxic waste removal laborer, water boys, tool room checker, carpenter tenders, civil engineer helpers, rodman, grade checkers, concrete pouring and curing, concrete forms stripping and wrecking, hand digging and backfilling of ditches, clearing of right of ways and building sites, wood sheeting and shoring, signalman for concrete bucket and general cleaning,

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

LABORERS: (Continued)

and environmental laborer - nuclear, radiation, toxic and hazardous waste - Level D.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$12.62 |
| | FRINGE BENEFITS | 3.48 |

All air tool operators, air track drills, asphalt rakers, tampers, batchers plant and scale man, chain saw, concrete saw, electric hand grinder, all electric bush and chipping hammers, flagmen, forklift operators, form setter (street or highway), metal form setters, heaters, mesh handlers on walkways, streets and roadways outside building, gunnite laborers, hand spiker, introflax burning rod, joint makers, mason tenders, multi-trade tender, pipe layers, plaster tenders, powderman helpers, power driven Georgia buggies, power posthole diggers, railroad laborers, sandblaster laborers, scow man and deck hand, signal man, sweeper and cleaner machines, vibrator operators, walk behind trenching machines, mortar mixer machines, water pumpmen, and environmental laborers - nuclear, radiation, toxic and hazardous waste - Level C.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$13.02 |
| | FRINGE BENEFITS | 3.48 |

Gunnite nozzleman and gunnite nozzle machine operator, sand blaster nozzleman, concrete or grout pumpman, plaster pumpman.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$13.22 |
| | FRINGE BENEFITS | 3.48 |

Powderman and blaster, and environmental laborer - nuclear, radiation, toxic and hazardous waste - Level B.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$13.32 |
| | FRINGE BENEFITS | 3.48 |

Caisson holes (6 ft. and over) pressure and free air including tools, construction specialist, and environmental laborer-nuclear, radiation, toxic and hazardous waste - Level A.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$13.82 |
| | FRINGE BENEFITS | 3.48 |

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

LABORERS: (Continued)

Tunnel man and tunnel sand miner, cofferdam (pressure and free air), sand hog or mucker (pressure or free air).

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$14.12 |
| | FRINGE BENEFITS | 3.48 |

*Employees handling chemically treated materials which are harmful to the skin shall receive an additional \$.25 above base rate.

Aging and curing of concrete (any mode or method), asbestos abatement worker, asphalt plant laborers, asphalt laborers, batch truck dumpers, carpenter tenders, cement mason tenders, cleaning of machines, concrete laborers, demolition laborers, dredging laborers, drill helper, environmental laborer - nuclear, radiation, toxic and hazardous waste - Level D, flagmen, grade checkers, all hand digging and hand back filling, highway marker placers, landscaping laborers, mesh handlers and placers, puddler, railroad laborers, rip-rap and grouters, right of way laborers, sign, guard rail and fence installers (all types), signal men, sound barrier installer, storm and sanitary sewer laborers, swampers, truck spotters and dumpers, and wrecking of concrete forms.

| | | |
|-----------------|-----------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.47 |
| | FRINGE BENEFITS | 4.13 |

Batter board men (sanitary and storm sewer), brickmason tenders, mortar mixer operator, burner and welder, bushammers, chain saw operator, concrete saw operators, deckhand scow man, dry cement handlers, environmental laborers - nuclear, radiation, toxic and hazardous waste - Level C, forklift operators for masonry, form setters, green concrete cutting, hand operated grouter and grinder machine operator, jack hammers, lead paint abatement, pavement breakers, paving joint machine, pipe layers-laser operators (non-metallic), plastic pipe fusion, power driven georgia buggy or wheelbarrow, power post hole diggers, precast manhole setters, walk-behind tampers, walk-behind trenchers, sand blasters, concrete chippers, surface grinders, vibrator operators, wagon drillers.

| | | |
|-----------------|-----------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.72 |
| | FRINGE BENEFITS | 4.13 |

Air track driller (all types), asphalt luteman and rakers, gunnite nozzleman, gunnite operators and mixers, grout pump operator, powderman and blaster, side rail setters, rail paved ditches, screw operators, tunnel laborers (free air), and water blasters.

| | | |
|-----------------|-----------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.77 |
| | FRINGE BENEFITS | 4.13 |

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

LABORERS: (Continued)

Caisson workers (free air), cement finishers, environmental laborer - nuclear, radiation, toxic and hazardous waste - Levels A and B, miners and drillers (free air), tunnel blasters, and tunnel muckers (free air).

| | | | |
|-----------------------------------|-----------------|-----------------|---------|
| | HEAVY & HIGHWAY | BASE RATE | \$15.37 |
| | | FRINGE BENEFITS | 4.13 |
| MARBLE, TILE & TERRAZZO WORKERS | | BASE RATE | \$15.00 |
| | | FRINGE BENEFITS | 2.69 |
| MARBLE, TILE & TERRAZZO FINISHERS | | BASE RATE | \$ 9.90 |
| | | FRINGE BENEFITS | 2.69 |
| MILLWRIGHTS | | BASE RATE | \$16.88 |
| | | FRINGE BENEFITS | 5.32 |

PAINTERS:

Brush, Roller, Paperhanger, Taping & Finishing

| | | | |
|-------------------|----------|-----------------|---------|
| | BUILDING | *BASE RATE | \$12.35 |
| | | FRINGE BENEFITS | 2.54 |
| Spray & Sandblast | BUILDING | *BASE RATE | \$13.10 |
| | | FRINGE BENEFITS | 2.54 |

*Hazardous work shall receive additional \$.50 above base rate and shall include: steeple jack work, towers, elevated tanks, bridges, boatswain chairs, safety belt work, and all skeleton framing steel on all construction work, or work in enclosed buildings over 35 feet in height above permanent working floor area: steam cleaning and sand blasting work, also exterior high line pipe (not painted from ground, ladder or scaffolding); exterior stage work, window jack work. Special coatings premium will add \$.25 to base rate and shall apply to: coatings containing ketones, such as lacquers, solvent based catalyzed epoxy, chlorinated rubber and urethane coatings.

| | | | |
|----------------------------------|-----------------|-----------------|---------|
| Brush and Roller | HEAVY & HIGHWAY | BASE RATE | \$18.20 |
| | | FRINGE BENEFITS | 5.08 |
| Drywall finishers and Plasterers | | | |
| | HEAVY & HIGHWAY | BASE RATE | \$18.45 |
| | | FRINGE BENEFITS | 5.08 |

CLASSIFICATIONS RATE AND FRINGE BENEFITS

PAINTERS: (Continued)

Spray, sandblast, power tools, waterblast and steam cleaning, brush and roller of mastics, creosotes, kwinch koate and coal tar epoxy.

HEAVY & HIGHWAY BASE RATE \$19.20
FRINGE BENEFITS 5.08

Spray of mastics, creosotes, kwinch koate and coal tar epoxy.

HEAVY & HIGHWAY BASE RATE \$20.20
FRINGE BENEFITS 5.08

PLASTERERS

*BASE RATE \$17.14
FRINGE BENEFITS 1.65

*Add \$.50 to base rate for nozzle operator, except texturing machine with gravity-fed nozzle, and for employees working on swinging scaffold up to 50 ft. Add \$1.00 to base rate for employees working on swinging scaffold over 50 ft. Subtract \$1.00 from base rate for employees finishing drywall or outsulation work.

PLUMBERS & PIPEFITTERS

BASE RATE \$21.15
FRINGE BENEFITS 4.52

ROOFERS

BASE RATE \$15.00

SHEETMETAL WORKERS

BASE RATE \$21.15
FRINGE BENEFITS 7.82

SPRINKLER FITTERS

BASE RATE \$20.30
FRINGE BENEFITS 6.30

TEAMSTERS:

Truckhelper and warehouseman

BUILDING *BASE RATE \$15.05
**FRINGE BENEFITS 5.65

Driver 3 tons and under, greaser, tire changer and mechanic helper.

BUILDING *BASE RATE \$15.17
**FRINGE BENEFITS 5.65

Driver over 3 tons, semi-trailer or pole trailer, dump trucks, tandem axle, farm tractor when used to pull building material or equipment.

BUILDING *BASE RATE \$15.28
**FRINGE BENEFITS 5.65

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

TEAMSTERS: (Continued)

Driver, concrete mixer trucks (all types, hauling only on job sites), truck mechanics.

| | | |
|----------|-------------------|---------|
| BUILDING | *BASE RATE | \$15.35 |
| | **FRINGE BENEFITS | 5.65 |

Driver, Euclid and other heavy earthmoving equipment and lowboy, winch truck and A-Frame and monorail truck when used to transport building materials, fork lift truck when used inside warehouse or storage area.

| | | |
|----------|-------------------|---------|
| BUILDING | *BASE RATE | \$15.45 |
| | **FRINGE BENEFITS | 5.65 |

*Employees who perform work either on or hauling to or from any hazardous or toxic waste site will receive \$4.00 in addition to their base rate of pay.

Truckhelper and warehouseman, mobile batch truck helper.

| | | |
|-----------------|-------------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.67 |
| | **FRINGE BENEFITS | 6.42 |

Greaser, tire changer and mechanic helper.

| | | |
|-----------------|-------------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.78 |
| | **FRINGE BENEFITS | 6.42 |

Driver - single axle dump and flatbed trucks, semi-trailer or pole trailer when used to pull building materials and equipment, tandem axle dump truck, driver of distributors, truck mechanic.

| | | |
|-----------------|-------------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.96 |
| | **FRINGE BENEFITS | 6.42 |

Driver on mixer trucks (all types).

| | | |
|-----------------|-------------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$14.99 |
| | **FRINGE BENEFITS | 6.42 |

Driver - Euclid and other heavy earthmoving equipment and lowboy, articulator cat truck, 5-axle vehicle, winch truck and A-Frame truck when used in transporting materials, Ross Carrier, forklift truck when used to transport building materials, driver on pavement breakers.

| | | |
|-----------------|-------------------|---------|
| HEAVY & HIGHWAY | BASE RATE | \$15.06 |
| | **FRINGE BENEFITS | 6.42 |

**FRINGE BENEFITS apply to employees who have been employed a minimum of twenty (20) workdays within any ninety (90) consecutive day period for that employer.

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

OPERATING ENGINEERS:

Auto patrol, batcher plant, bituminous paver, cableway, central compressor plant, clamshell, concrete mixer (21 cu. ft. or over), concrete pump, crane, crusher plant, derrick, derrick boat, ditching and trenching machine, dragline, dredge operator, dredge engineer, elevating grader and all types of loaders, forklift (regardless of lift height), hoe-type machine, hoist (1 drum when used for stack or chimney construction or repair), hoisting engineer (2 or more drums), locomotive, motor scraper, carry-all scoop, bulldozer, heavy duty welder, mechanic, orangepeel bucket, piledriver, power blade, motor grader, roller (bituminous), scarifier, shovel, tractor shovel, truck crane, winch truck, push dozer, highlift, all types of boom cats, core drill, hopto, tow or push boat, A-frame winch truck, concrete paver, gradeall, hoist, hyster, pumpcrete, Ross carrier, boom, tail boom, rotary drill, hydro hammer, mucking machine, rock spreader attached to equipment, scoopmobile, KeCal loader, tower cranes (French, German and other types), hydrocrane, backfiller, gurries, sub-grader, tunnel mining machines including moles, shields, or similar types of tunnel mining equipment.

| | | |
|----------|-----------------|---------|
| BUILDING | *BASE RATE | \$18.30 |
| | FRINGE BENEFITS | 5.55 |

All air compressors (over 900 CFM), bituminous mixer, joint sealing machine, concrete mixer (under 21 cu. ft.), form grader, roller (rock), tractor (50 HP and over), bull float, finish machine, outboard motor boat, flexplane, fireman, boom type tamping machine, greaser on grease facilities servicing heavy equipment, switchman or brakeman, mechanic helper, whirley oiler, self-propelled compactor, tractair and road widening trencher and farm tractor with attachments (except backhoe, highlift and endloader), elevator (regardless of ownership when used for hoisting any building material), hoisting engineer (1-drum or buck hoist, Firebrick masonry excluded), well points, grout pump, throttle-valve man, tugger, electric vibrator compactor, and caisson drill helper.

| | | |
|----------|-----------------|---------|
| BUILDING | BASE RATE | \$15.56 |
| | FRINGE BENEFITS | 5.55 |

Bituminous distributor, cement gun, conveyor, mud jack, paving joint machine, roller (earth), tamping machine, tractors (under 50 HP), vibrator, oiler, concrete saw, burlap and curing machine, truck crane oiler, hydro-seeder, power form handling equipment, deckhand steersman, hydraulic post driver, and drill helper.

| | | |
|----------|-----------------|---------|
| BUILDING | BASE RATE | \$14.79 |
| | FRINGE BENEFITS | 5.55 |

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

OPERATING ENGINEERS: (Continued)

A-Frame winch truck, auto patrol, backfiller, batcher plant, bituminous paver, all types of boom cats, bulldozer, cableway, carry-all scoop, central compressor plant operator, clamshell, concrete mixer (21 cu. ft. or over), concrete paver, truck-mounted concrete pump, core drills, crane, crusher plant, derrick, derrick boat, ditching and trenching machine, dragline, elevating grader and all types of loaders, grade-all, gurries, high lift, hoe-type machine, hoist (two or more drums), hoisting engine (two or more drums), hydrocrane, hyster, KeCal loader, Letourneau, locomotive, mechanic, mechanic welder, mucking machine, motor scraper, orangepeel bucket, piledriver, power blade, pumpcrete, push dozer, rock spreader attached to equipment, all rotary drills, roller (bituminous), scarifier, scoopmobile, shovel, side boom, sub-grader, tailboom, tow or push boat, tower cranes (French, German and other types), tractor shovel and truck crane.

HEAVY & HIGHWAY **BASE RATE \$19.55
FRINGE BENEFITS 5.90

All air compressors (over 900 cu. ft. per min.), bituminous mixer, boom type tamping machine, bull float, concrete mixer (under 21 cu. ft.), dredge engineer, electric vibrator compactor/self-propelled compactor, elevator (one drum or buck hoist), elevator (regardless of ownership when used to hoist building material), finish machine, firemen, flex-plane, forklift (regardless of lift height), form grader, hoist (one drum), joint sealing machine, mechanic helper, outboard motor boat, power sweeper (riding type), roller (rock), ross carrier, skid mounted or trailer mounted concrete pumps, switchman or brakeman, throttle valve man, tractair and road widening trencher, tractor (50 HP and over), truck crane oiler, tugger, welding machine, well points, and whirley oiler.

HEAVY & HIGHWAY BASE RATE \$17.13
FRINGE BENEFITS 5.90

Greaser on grease facilities servicing heavy equipment.

HEAVY & HIGHWAY BASE RATE \$17.51
FRINGE BENEFITS 5.90

Bituminous distributor, burlap and curing machine, caisson drill and core drill helper (track or skid mounted), cement gun, concrete saw, conveyor, core drill, deckhand oiler, grout pump, hydraulic post driver, hydro seeder, mud jack, oiler, paving joint machine, power form handling equipment, pump, roller (earth), steermen, tamping machine, tractors (under 50 H.P.) and vibrator.

HEAVY & HIGHWAY BASE RATE \$16.87
FRINGE BENEFITS 5.90

CLASSIFICATIONS

RATE AND FRINGE BENEFITS

OPERATING ENGINEERS: (Continued)

*Operators on cranes with booms one-hundred fifty feet (150') and over (including jib) shall receive seventy-five (\$.75) above base rate. All cranes with piling leads will receive (\$.50) above base rate regardless of boom length.

**Operators on cranes with booms one hundred fifty feet (150) and over (including jib) shall receive fifty (\$.50) cents above base rate.

Employees assigned to work below ground level are to be paid 10% above base rate. This does not apply to open cut work.

WELDERS - Receive rate for craft in which welding is incidental.

NOTE: The type of construction shall be determined by applying the following definitions.

BUILDING CONSTRUCTION

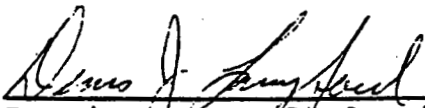
Building construction is the construction of sheltered enclosures with walk-in access for the purpose of housing persons, machinery, equipment, or supplies. It includes all construction of such structures, the installation of utilities and the installation of equipment, both above and below grade level, as well as incidental grading, utilities and paving.

HIGHWAY CONSTRUCTION

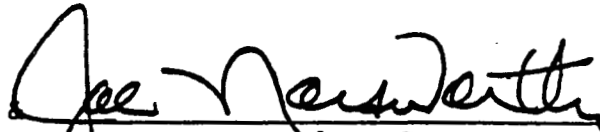
Highway construction includes the construction, alteration or repair of roads, streets, highways, runways, taxiways, alleys, trails, paths, parking areas, and other similar projects not incidental to building or heavy construction. It includes all incidental construction in conjunction with the highway construction project.

HEAVY CONSTRUCTION

Heavy projects are those projects that are not properly classified as either "building" or "highway". For example, dredging projects, water and sewer line projects, dams, flood control projects, sewage treatment plants and facilities, and water treatment plants and facilities are considered heavy.



Dennis J. Langford, Director
Employment Standards,
Apprenticeship & Training
Kentucky Labor Cabinet



Joe Norsworthy, Secretary
Kentucky Labor Cabinet
Frankfort, Kentucky 40601

This 5th day of January, 1998.

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____, hereinafter called Principal, and
(Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

(Name of Owner)

(Address of Owner)

hereinafter called OWNER in the total aggregate penal sum
of _____

_____ Dollars (\$ _____)

in lawful money of the United States, for the payment of which sum well
and truly to be made, we bind ourselves, our heirs, executors,
administrators, successors, and assigns, jointly and severally, firmly
by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal
entered into a certain contract with the OWNER, dated the
_____ day of _____ 19____, a copy of which is hereto
attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER with or without notice to the SURETY and during the one year guaranty period and if the PRINCIPAL shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said SURETY, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that it is expressly agreed that the BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as so amended. The term "Amendment", wherever used in this BOND, and whether referring to this BOND, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiaries hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____
counterparts, each one of which shall be deemed an original, this the
_____ day of _____ Number

ATTEST: _____ Principal

(Principal) Secretary

(SEAL)

By _____ (s)

_____ (Address)

Witness as to Principal

(Address)

Surety

ATTEST:

Witness to Surety

By _____ Attorney-in-Fact

(Address)

(Address)

NOTE: Date of BOND must not be prior to date of Contract.

IMPORTANT: If CONTRACTOR is partnership, all partners should execute BOND.
Surety companies executing BONDS must appear on the Treasury
Department's most current list (Circular 570 as amended) and be
authorized to transact business in the state where the project is
located.

oOo

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a _____ hereinafter called PRINCIPAL and
(Corporation, Partnership or Individual)

(Name of Surety)

hereinafter called SURETY, are held and firmly bound unto _____

(Name of Owner)

(Address of Owner)

hereinafter called OWNER and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of _____ Dollars (\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the PRINCIPAL entered into a certain contract with the OWNER, dated the _____ day of _____ 19____, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the PRINCIPAL shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and for all labor cost incurred in such WORK including that by a SUBCONTRACTOR, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the SUBCONTRACTORS, and persons, firms, and corporations having a direct contract with the PRINCIPAL or its SUBCONTRACTORS.

PROVIDED, FURTHER, that the said SURETY for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the WORK or to the SPECIFICATIONS.

PROVIDE, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) Unless claimant, other than one having a direct contract with the PRINCIPAL shall have given written notice to any two of the following: The PRINCIPAL, the OWNER, or the SURETY above named within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER, or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased work on said CONTRACT, is being understood, however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this BOND and whether referring to this BOND, the contract or the loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

WITNESS WHEREOF, this instrument is executed in _____
Number _____
counterparts, each of which shall be deemed an original, this the _____
day of _____

ATTEST:

Principal

(Principal) Secretary

(SEAL)

By _____ (s)

(Address)

Witness as to Principal

(Address)

Surety

ATTEST:

Witness as to Surety

(Address)

By _____
Attorney-in-Fact

(Address)

NOTE: Date of BOND must not be prior to date of Contract.
If CONTRACTOR Is partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury
Department's most current list (Circular 570 as amended) and be
authorized to transact business in the State where the Project is
located.

oOo

PB-6

CONTRACT AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 19____
by and between _____
(Owner)

acting through its _____ hereinafter called
(Mayor, Utility Commission, Chairmen)

the OWNER and _____ doing business as
(Contractor)

_____ of the city of _____,
(an individual)(partnership)(a corporation)

_____, County, State of _____

hereinafter called the CONTRACTOR.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

The CONTRACTOR will commence and complete the construction of

The CONTRACTOR will furnish all of the materials, supplies, tools, equipment, labor and other services necessary for the construction and completion of the project described herein.

The CONTRACTOR will commence work under this contract on or before the date to be specified by the Owner, in a written "Notice to Proceed" and will fully complete the project within _____ consecutive calendar days thereafter. The CONTRACTOR further agrees to pay as liquidated damages, the sum of \$ _____ for each consecutive calendar day that the work remains uncomplete after the expiration date of this contract, as modified by Change Order.

The CONTRACTOR agrees to perform all of the WORK described in the CONTRACT DOCUMENTS for the sum of \$ _____,
or as shown in the Bid Schedule, Pages CON _____ thru CON _____.

The term "CONTRACT DOCUMENTS" means and includes the following: SPECIFICATIONS prepared or issued by Haworth, Meyer & Boleyn, Inc.

| <u>TITLE</u> | <u>DESIGNATION</u> | <u>TOTAL PAGES</u> |
|------------------------------|--------------------|--------------------|
| Advertisement for Bids | AD | |
| Instructions to Bidders | IB | |
| General Conditions | GC | |
| Labor Regulations | LR | |
| Performance and Payment Bond | PB | |
| Contract Agreement | CON | |
| Notice of Award | NA | |
| Notice to Proceed | NP | |
| Change Order Format | CO | |
| Special Conditions | SC | |
| Technical Specifications | TS | See Below |

Technical Specifications

| DIVISION (TS) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| PAGES | | | | | | | | | | | | | | | | |

Where the "NA" is shown indicates that the Division is not applicable to and is omitted from this Contract.

DRAWINGS prepared by Haworth, Meyer & Boleyn, Inc.

numbered _____ through _____ and dated _____.

The following ADDENDA are included as part of this Contract:

ADDENDUM NO. _____

DATE _____

The OWNER shall make progress payments as the work is completed, in accordance with the appropriate Articles of the General Conditions.

Final payment shall be due thirty (30) days after completion and acceptance of the work.

Before issuance of final certificate, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the work have been paid.

If, after the work has been substantially completed, full completion thereof is materially delayed through no fault of the Contractor, and the Engineer so certifies, the Owner shall, upon certificate of the Engineer and without terminating the contract, make payment of the balance due for that portion of the work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

BID SCHEDULE

All executed Bid Documents will be included in this position in the final Contract Documents that are executed between the Owner and the Contractor.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in _____ copies each of which shall be deemed an original on the date first above written.

This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

ATTEST:

Title
(SEAL)

ATTEST:

Title

CONTRACTOR

By _____
Title

OWNER

By _____
Title

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly
authorized and acting legal representative of _____
_____, do hereby certify as follows:

I have examined the attached contract(s) and performance and payment bond(s) and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions, and provisions thereof.

Date: _____

FmHA Concurrence.

As lender or insurer of funds to defray the costs of this contract, and without liability for any payments thereunder, the Farmers Home Administration (FmHA) hereby concurs in the award of this CONTRACT to

U.S. Department of Agriculture
Farmers Home Administration

By _____ Title _____

Date _____

This CONTRACT shall not be effective unless and until concurred in by the State Director of the Farmers Home Administration, U.S. Department of Agriculture or a delegated representative.

NOTICE OF AWARD

TO: _____

PROJECT
Description: _____

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated _____, 19____, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of \$ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 19____.

Owner
By _____
Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

by _____ this
the _____ day of _____, 19____.
By _____
Title _____

NOTICE TO PROCEED

TO: _____ DATE: _____

Project: _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 19____, on or before _____, 19____, and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 19____.

Owner
By _____
Title _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____

_____ this the _____, 19____

By _____
Title _____

Employer Identification Number _____

oOo

CONTRACT CHANGE ORDER

| | |
|--------------|--------|
| | DATE |
| | STATE |
| CONTRACT FOR | COUNTY |
| OWNER | |

To _____
(Contractor)
You are hereby requested to comply with the following changes from the contract plans and specifications:

| Description of Changes (Supplemental Plans and Specifications Attached) | DECREASE in Contract Price | INCREASE in Contract Price |
|--|-------------------------------|-------------------------------|
| | \$ | \$ |
| TOTALS | \$ | \$ |
| NET CHANGE IN CONTRACT PRICE | \$ | \$ |

JUSTIFICATION:

The amount of the Contract will be (Decreased) (Increased) By The Sum Of: _____ Dollars (\$ _____).

The Contract Total Including this and previous Change Orders Will Be: _____ Dollars (\$ _____).

The Contract Period Provided for Completion Will Be (Increased) (Decreased) (Unchanged): _____ Days

This document will become a supplement to the contract and all provisions will apply hereto.

| | |
|--|--------------|
| Requested _____ (Owner) | _____ (Date) |
| Recommended _____ (Owner's Architect/ Engineer) | _____ (Date) |
| Accepted _____ (Contractor) | _____ (Date) |
| Approved By FmHA _____ (Name and Title) | _____ (Date) |

This information will be used as a record of any changes to the original construction contract.

SPECIAL CONDITIONS

1. PROJECT FUNDING

Contractors bidding the project should be aware that funding is provided in the form of a loan & grant from Rural Development.

2. PROJECT INSPECTION

The Inspection services shall be provided by the Engineer. The Inspector shall be on the project at all times; however, due to meetings, etc. there may be times when he is not with the crew. Therefore, the Contractor shall not backfill any water main and/or appurtenances until the Inspector has seen it.

3. UNCLASSIFIED EXCAVATION

All excavation is unclassified, no extra payment will be allowed for solid rock excavation. It is the Contractor's responsibility to make any additional investigations.

4. CONFLICTING SECTIONS/STATEMENTS IN CONTRACT DOCUMENTS

a. General

It shall be noted that if any provisions in these Contract Documents is in conflict and/or is inconsistent with any other section or provisions, then the most stringent shall apply per the interpretation of the ENGINEER.

b. Arbitration

Section 33.1 Arbitration of the General Conditions (HMB's) shall be omitted and Section 30.1 Arbitration of the Rural Development (RUS) General Conditions, Supplemental General Conditions shall apply.

c. Hold Period on Bids

All bids shall remain valid for a period of 90 days. Any reference to a lesser period of time is incorrect. Page IB-1 shall be changed from 60 days to 90 days.

5. CONTRACTOR'S INSURANCE CERTIFICATE

The following wording for the cancellation clause on the insurance certificate is required by Rural Development:

"Should any of the above described policies be canceled before the expiration date thereof, the issuing company will mail 15 days written notice to the certificate holder named to the left."

6. FEDERAL/STATE/LOCAL REGULATIONS

The Contractor shall abide by all local and state laws or ordinances to the extent that such requirements do not conflict with federal laws or regulations.

7. SILTATION AND SOIL EROSION

The Contractor shall make every effort during construction to minimize siltation and soil erosion and comply with all local and state codes that pertain to this project.

8. RADIO TELEMETRY SYSTEM

The Contractor shall pay particular attention to this section. Two new RTU's are required on this project. They are to be located at the new tank and pump station. The existing tank and pump station have a telemetry system. The RTU at the existing pump station shall be wired to the proposed flow control valve to control and regulate the flow through this valve. The existing tank shall "talk" to the existing pump station and flow control valve. The new tank shall "talk" to the new pump station which will call pumps to start and stop at predetermined set points. The Contractor shall submit a detailed plan for the telemetry system and its operation prior to ordering equipment.

9. FLOW CONTROL VALVE

The flow control valve required on this project shall be a solenoid controlled throttling valve which will be wired into the telemetry system within the pump station. This valve shall be designed to open on a predetermined low tank level and allow flow through the valve at a rate of 150 GPM. The valve shall close on a predetermined high tank level. The flow rates and set points shall both be adjustable. Wiring from the existing pump station to the flow control valve shall be coordinated with the ENGINEER. There is an existing casing pipe in place under Catnip Hill Road. At the Contractor's option this may be utilized for installation of conduit. The Contractor shall submit a plan for approval to the ENGINEER.

10. BOOSTER PUMP STATION SITE

The Contractor shall pay particular attention to the required site work at the pump station. The Contractor shall relocate the existing board fence as shown on the plans. No blasting is allowed at the pump station site; all rock excavation shall be done by hoe ramming. The Contractor shall pay particular attention not to disturb an existing spring house located near the pump station site.

11. The exact location the mainline PRV shall be discussed with the ENGINEER prior to beginning construction.

TECHNICAL SPECIFICATIONS

SECTION A

GENERAL INFORMATION AND REQUIREMENTS

1. GENERAL

- 1.1 These technical specifications include descriptions of materials which may or may not be used on this project.
 - 1.1.1 The Contractor shall carefully read the Special Provisions for statements concerning other specifications which may be applicable to the Project.
- 1.2 Materials shall be of the types and constructed on the materials specified herein when identified on Plans, Bid Form or Measurement for Payment. Materials and accessories shall be of new and unused material and shall be installed in accordance with manufacturer's specifications and/or as shown on the plans.
- 1.3 The Contractor shall be responsible for the safe storage and handling of all material furnished to or by him, and accepted by him, until it has been incorporated into the completed project and the project has been accepted by the Owner.
 - 1.3.1 The Contractor shall handle all materials and equipment in such a manner to avoid damage. All material and equipment whether moved by hand, skidways, hoists or other means shall be handled in such a manner to avoid dropping or bumping against other material or equipment.
 - 1.3.2 In distributing material at the site of work, each piece shall be unloaded as near as possible to final installation point to minimize the number of times it must be handled.

2. PROTECTION OF UNDERGROUND AND SURFACE STRUCTURES AND OTHER PROPERTY

2.1 General

2.1.1 Temporary support, adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of the work shall be furnished at the Contractor's expense incidental to the project.

2.2 Obstruction by Other Utilities

2.2.1 Existing underground utilities shown on the plans are shown in approximate locations based on information furnished by others. Prior to beginning construction of proposed facilities the Contractor shall accurately locate existing underground utilities by whatever means necessary including excavation where required. The Contractor shall notify the Engineer where utilities, so located will interfere with proposed construction.

2.2.2 Where the limits of construction of the proposed work encroaches upon existing utilities, the Contractor, where possible, shall provide temporary support or protection satisfactory to the owners of the utility to permit continuation of proposed construction. Cost associated with said temporary support and/or protection shall be incidental to construction and no additional payment authorized.

2.2.3 Where existing utilities are encountered which prohibit construction of proposed facilities unless relocated the Contractor shall so notify the Engineer unless the plans provide for their relocation. Relocation shall be accomplished in a manner acceptable to the owner of the utility, and shall be furnished at the contractor's expense incidental to the project.

2.3 Property Protection

2.3.1 Extreme care shall be taken to protect trees, fences, poles, crops and all other property from damage unless their removal is authorized by the Engineer. Any damaged property shall be restored to as good or better than original condition and shall meet with the approval of the Engineer and Owner.

2.3.2 The Contractor has the right to fully utilize the easement unless specifically stated otherwise on the plans or by the Engineer. If any irreplaceable trees, fences, poles or crops, such as tobacco, corn, soy beans and such (excluding pasture land), occur on the easement the Contractor shall obtain the Engineer's and Owner's approval prior to removing or otherwise causing damage to any of these items.

2.3.3 Beyond the limits of the easement the contractor shall be responsible for any damage caused by his operations and/or his personnel.

3. INCIDENTAL ITEMS OF CONSTRUCTION

3.1 Barricades, Guards, and Safety Provisions

3.1.1 To protect the public from injury and to avoid property damage, adequate barricades, construction signs, warning lights and guards shall be placed and maintained by the Contractor during the progress of construction work until it is safe for the public to use the construction site.

3.1.2 The Contractor shall provide and maintain all safety facilities and devices required by the Occupational Safety and Health Act (OSHA). The Engineer is not responsible for safety provisions furnished or used by the Contractor nor will the Engineer advise or direct safety operations of the Contractor.

3.2 Traffic and Utility Control

3.2.1 All excavations shall be conducted in a manner to cause the least interruption to traffic. The Contractor shall provide suitable bridges at streets and driveways where traffic must cross excavated areas.

3.2.2 Driveways and other private and public access routes shall not be kept blocked or closed by the Contractor for more than a reasonable period of time without prior written approval from the property owner or controlling authority.

3.2.3 Existing fire hydrants, valve pit covers, valve boxes, meter boxes, curb-stop boxes, fire or police call boxes or other utility controls shall be kept unobstructed and accessible during the construction period.

3.3 Maintenance of Utility Service and Flow of Drains

- 3.3.1 Adequate provisions shall be made for the maintenance of flow in sewers (storm or sanitary), drains, water lines and gas lines and electrical lines encountered during construction.
- 3.3.2 No valve, switch or other control device of any utility system within the construction, area shall be operated by the Contractor without approval of the utility except in cases of an emergency. All utility customers which will be affected by the operation of any utility valve or control device shall be notified by the Contractor in sufficient time for each customer to made arrangements for the period of no service. Each customer shall be advised as to the time service will be off and probable time when it will be resumed

3.4 Fencing

- 3.4.1 When the pipe line is being constructed through fields where livestock is being held the contractor shall provide, either by temporary fencing or stationing of personnel, adequate protection to livestock from machinery and open trenches. The Contractor shall take all precautions necessary to insure that all animals are not isolated form their source of water.
- 3.4.2 Where pipe line crosses fences in good condition and the work area is easily accessible through gates, the Contractor shall excavate or tunnel beneath the fences.
- 3.4.3 When it is necessary to cut existing fences, new end posts shall be installed one each side of the construction easement and old fence thoroughly stapled to these new posts before cutting fence.

After pipe is installed at this point and backfill is completed, a new fence of galvanized wire (No. 9 gauge) shall be stretched between the new posts and thoroughly stapled to existing post and any new intermediate posts necessary to provide a good fence. Replacement of fences shall be on an in kind basis and shall be considered incidental to installation of the pipe line.

4. SUMMARY

4.1 The Contractor shall furnish at the site of Work, all materials, labor and equipment necessary to complete the Work in accordance with the terms of the Contract and as required hereunder. He shall make the required excavation for installing the water lines and all other appurtenant structures: do all ditching, diking, pumping bailing and draining or otherwise lowering and disposing of water encountered in the excavation necessary for rendering the foundation firm, dry and adequate for installing the water lines and appurtenances; do, as required, all sheeting, shoring, bracing, coffer damming and supporting; provide all lighting, barricades, signs, flagmen and watchmen: make all provisions necessary to maintain and protect, buildings, paved surfaces, fences, trees, shrubs, piles, water pipes, gas pipes, sewers, water courses, surface drains, railroads, railways and other structures in, on, across or adjacent to the Work and repair all damage done to them where and as required; provide all temporary bridges, detours or other means of maintaining travel, both vehicular and pedestrian; construct all concrete, brick and like work; lay all water lines and connections; set in place all iron and other metal work; backfill all trenches; restore walks, grass pots, shrubs, trees, flowers, fences, paved surface, etc. damaged or disturbed; clear away all rubbish and surplus materials; furnish all materials, tools, implements, machines, tracks, pumps, forms supplies and labor required to build and put in complete and acceptable working order the water lines and appurtenances covered by the Contract Documents and described by the plans and specifications.

TECHNICAL SPECIFICATIONS

SECTION B

RELATED PIPING MATERIALS AND EQUIPMENT

1. GENERAL DESCRIPTION

1.1 All materials necessary for the completion of the Work shall be furnished by the Contractor, as approved by the Engineer to meet the requirements of the Plans and Specifications. Any materials found to be defective or not meeting the Specifications shall be rejected and replaced by approved materials at no additional cost to the Owner.

1.2 CONCRETE MATERIALS

Materials used in all concrete construction shall be governed by the Concrete Section of these Technical Specifications.

2. BACKFILL MATERIALS

2.1 General

The following materials shall be used to backfill any trenches so designated and in any situation shown on the Plans where such materials are specified.

2.2 SAND OR SANDY MATERIALS

Sandy backfill in trenches for water lines, property service connections, and structures within the limits of existing or proposed paved surfaces and sand or sandy materials for other miscellaneous construction purposes not specified herein shall consist of natural, crushed, or conglomerate sand containing not more than twenty (20) percent clay.

2.3 COARSE AGGREGATES

Coarse aggregates shall conform to Kentucky Bureau of Highways Standard Specifications (Latest Edition) Section 806, and shall be of the size and type as indicated on the Plans or Specifications.

2.4 SELECTED EXCAVATED MATERIALS

Backfill in trenches for water lines, property service connections, and structures outside the limits of existing or proposed paved surfaces, and in other specified locations shall be made with selected excavated materials taken from the trench excavation. The specified makeup of this materials shall be governed by the Plans or Section E-1.17 of these Technical Specifications.

3. PAVING MATERIALS

3.1 General

All materials used for pavement replacement shall conform to requirements and regulations of the local governments and to Sections 401 and 806 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition) except for basis of payment.

3.2 CONCRETE SURFACE

Materials used in the construction of the concrete surface shall conform to Section 501.02 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition).

3.3 BITUMINOUS CONCRETE SURFACE

Materials used in construction of the bituminous concrete surface shall conform to Section 402.02 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition).

3.4 BITUMINOUS CONCRETE BASE

Materials used in construction of the bituminous concrete base shall conform to Section 403.02 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition).

3.5 BITUMINOUS TACK COAT

The material for the bituminous tack coat shall be type SS-1h and shall conform to Section 806 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition).

3.6 DGA BASE

Materials used for the compacted dense graded aggregate base shall conform to Section 303.02 of the Kentucky Bureau of Highways Standard Specifications (Latest Edition).

TECHNICAL SPECIFICATIONS

SECTION C

PIPE MATERIALS

1. GENERAL

- 1.1 These Specifications describe several types of pipe which may or may not apply to the current project. All types listed herein will be acceptable alternates if no indication is other wise given either on the Plans or in other sections of these Specifications.
- 1.2 Selected pipe materials will be identified either on the Plans, or the Bid Form, in Special Provision, or in Measurement for Payment. The Contractor shall thoroughly familiarize himself with each of the items identified above and base his bid on the pipe material given therein.
- 1.3 Handling of Pipe and Accessories
 - 1.3.1 Pipe and accessories shall be unloaded at the point of delivery, hauled to, and distributed at the site of the Project by Contractor in such a manner to avoid damage to the materials. Whether moved by hand, skidways, or hoists, materials shall not be dropped or bumped against pipe or accessories already on the ground or against any other object.
 - 1.3.2 In distributing material at the construction site, each piece shall be unloaded as near the installation point as possible.
 - 1.3.3 Pipe shall be handled in such a manner as to avoid damage to the ends. When such damaged pipe cannot be repaired to the Engineer's satisfaction, it shall be replaced at the Contractor's expense. The interior of all pipe and accessories shall be kept free from dirt and foreign matter at all times. The interior of all pipe and accessories shall be checked for dirt and debris and, if necessary, thoroughly cleaned before use in the Project.

2. CAST IRON PIPE AND FITTINGS

2.1 Scope

This article covers the design, manufacture and testing of cast iron pipe centrifugally cast in metal molds and cast iron fittings for pipe sizes three (3") inch through forty-eight (48") inch.

2.2 Specific Requirements

Cast iron pipe shall be centrifugally cast in metal molds and shall be furnished cement lined unless otherwise noted on the Plans or in other sections of the Specifications. Cast iron pipe shall be furnished with rubber-gasket push-on joints except as may otherwise be noted on the Plans or in difficult working areas and approval of the Engineer.

2.2.1 Thickness design of cast iron shall conform in all aspects to the requirements of ANSI-AWWA C101 latest revision.

2.2.2 Manufacture and testing of cast iron pipe centrifugally cast in metal molds shall comply with the requirements of the National Standard Institute and American Water works Association designation A 21.6/AWWA C106 latest revisions.

2.2.3 Cement mortar lining shall conform to the requirements of ANSI/AWWA C104/A 21.4, latest revision for Cement-Mortar Lining for Ductile Iron Pipe and Gray Iron Pipe and Fittings for Water.

2.2.4 Fittings and joints for cast iron pipe shall conform to the latest revisions of ANSI/AWWA C110 "Cast Iron and Ductile Iron Fittings, Three (3") Inches Through Forty-Eight (48") Inches, for Water and Other Liquids", ANSI/AWWA C111/A 21.11 "Rubber-Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings", and ANSI/AWWA C115 21.15 "Flanged Cast Iron and Ductile Iron Pipe with Threaded Flanges".

3. DUCTILE IRON PIPE AND FITTINGS

3.1 Scope

This article covers the design, manufacture, and testing of ductile iron centrifugally cast in metal molds and ductile iron fittings.

3.2 Specific Requirements

Ductile iron pipe shall be centrifugally cast in metal molds and shall be furnished cement lined unless otherwise noted on the Plans or in other sections of these Specifications. Ductile iron pipe shall be furnished with rubber gasket push-on joints except as may otherwise be noted on the Plans or in difficult working areas with approval of the Engineer.

3.2.1 Thickness design of ductile iron shall conform in all aspects to the requirements of ANSI/AWWA C150/A 21.50 latest revision.

3.2.2 Manufacture and testing of ductile iron pipe shall conform in all respects to the requirements of the latest revisions of ANSI/AWWA C151/A 21.51.

3.2.3 Cement Mortar Lining - See ART. 2.2.3 above.

3.2.4 Fittings and Joints - See ART. 2.2.4 above.

4. PVC (POLYVINYL CHLORIDE) PRESSURE PIPE

4.1 Scope

This article covers the design, manufacture and testing of PVC 1120 manufactured of Class 12454-A or Class 12454-B resin material with a hydrostatic-design-basis (HDB) rating of 4,000 psi at 73.4 degree F (23 degree C).

4.2 Specific Requirements

PVC pressure pipe shall be furnished, constructed of materials and to the specifications of this section. The types of PVC pipe permitted for use on the Project will be as noted on the Plans, Bid Documents or other sections of these Specifications. The selected pipe will be designated either as PVC (ASTM) or PVC (AWWA) followed by an appropriate pressure rating. The Contractor shall thoroughly review the Plans and other sections of these Specifications for the type of PVC pipe selected for the Project. All PVC pipe shall be NSF approved.

4.2.1 PVC (ASTM) pipe shall be furnished and installed when designated on the Plans or in the Bid Documents. When selected, by the Engineer, for use on the Project PVC (ASTM) pipe shall be designed, manufactured and

tested to conform with the latest revision of the American Society for Testing and Materials designated ANSI/ASTM D-2241.

- 4.2.2 PVC (AWWA) pipe shall be furnished and installed when designated on the Plans or in the Bid Documents. When selected, by the Engineer, for use on the Project, PVC (AWWA) pipe shall be designed, manufactured, and tested in conformance to the latest revision of the American Waterworks Association designation AWWA C900.
- 4.2.3 PVC pipe joints shall be rubber gasket push-on joints either constructed integrally with the pipe or as a separate coupling constructed on the same material and to the same pressure Specifications as the pipe.
- 4.2.4 PVC (ASTM) pipe shall be furnished as SDR 26, 21, and 17 for Class 160 psi, 200 psi and 250 psi respectively.
- 4.2.5 PVC (AWWA) pipe shall be furnished as SDR 25, 18, and 14 for Class 100 psi, 150 psi and 200 psi respectively.
- 4.2.6 PVC (AWWA) pipe shall be furnished with outside dimensions (O.D.) equal to that for ductile iron and cast iron pipe.
- 4.2.7 Fittings for PVC (ASTM) pipe may be either PVC, cast or ductile iron. Those for PVC (AWWA) pipe shall be ductile iron.

5. POLYETHYLENE PIPE AND FITTINGS

5.1 Scope

This section covers the design, manufacture and testing of polyethylene high density pressure pipe manufactured of grade P34 resin material with a hydrostatic - design basis (HDB) rating of 1,600 psi at 73.4 degree F (23 degree C).

5.2 Specific Requirements

The Contractor shall furnish and install high density polyethylene pipe meeting these Specifications at the locations indicated on the Plans and in other sections of these Specifications.

- 5.2.1 High density polyethylene pipe shall be manufactured and tested in conformance to the requirements of the latest revision of the American

Society for Testing and Materials designation ASTM D-3350 "Polyethylene Plastic Pipe and Fittings Materials".

5.2.2 High density Polyethylene pipe shall have a grade designation of PE 3406 and a cell classification designation of PE 355434C.

5.2.3 High density polyethylene pipe shall be joined by means of butt fusion.

5.2.4 Fittings for high density polyethylene pipe shall be manufactured of the same materials as the pipe. Unless otherwise indicated, all fittings shall be joined to the pipe by butt fusion techniques.

6. BALL AND SOCKET RIVER CROSSING PIPE

6.1 Scope

This article covers the design, manufacturer, and testing of Ductile Iron Ball and Socket River Crossing pipe.

6.2 Specific Requirements

Joints for ductile iron river crossing pipe shall be flexible, ball and socket type, boltless joints with rubber gaskets conforming to the ANSI specification for "Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings", A 21.11 (AWWA C11), Latest Revision.

TECHNICAL SPECIFICATIONS

SECTION D

PIPING APPURTENANCES

1. CRADLE AND ENCASEMENT

1.1 General

The cradle or encasement, as required to support the pipe, shall be of crushed stone or concrete and shall be installed as specified in the Pipe Work Section of these Specifications, and as shown on the Plans.

1.2 Crushed Stone Cradle

In all cases where the bedding is not specified the pipe is to be laid in crushed stone cradle. The crushed stone to be used shall be Kentucky Highway No. 9 or No. 78 Crushed Stone, as specified by the Kentucky Bureau of Highways Standard Specifications (Latest Revision).

1.3 Concrete Cradle, Encasement, or Cap

Where a concrete cradle, encasement, or cap is required, concrete shall conform to the Concrete Section of these Technical Specifications. Dimensions shall be as shown on the plans.

1.4 Concrete Thrust Blocks and Anchor Blocks

Where concrete thrust blocks and anchor blocks are required (i.e. at all pipe bends and fittings), concrete as specified in the Concrete Section of these Technical Specifications shall be used.

1.5 Special Concrete Structures and Vaults

Cast in place concrete structures shall be constructed of concrete conforming to the Concrete Section of these Technical Specifications to the dimensions and grades as shown on the Plans.

1.6 Valves and Related Appurtenances

1.6.1 General

All valves and related appurtenances shall be installed as shown on the Plans and specified in these Technical Specifications. Material Specifications shall be as described below. Any materials found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked and shall be replaced by materials approved by the Engineer, at no additional cost to the Owner.

1.7 Gate Valves

Gate valves shall be non-rising stem, iron body, bronze mounted, double disc, parallel seat type with o-ring stem seals. Unless otherwise specified the valves shall be suitable for 0-150 PSI operating pressures. Valves which are to be buried for outside use shall be furnished with a 2 inch operating nut and shall have mechanical joint ends. Other valves shall have either flanged or mechanical joint ends and shall be operated by handwheel or chain-wheel operator as shown on the Plans. All valves shall conform to AWWA Standard C 500, Latest Revision, relative to materials, manufacture, dimensions, inspections, testing, and markings.

1.8 Gate Valve Boxes

Each buried gate valve shall be provided with a 5 1/4" shaft, slide-type, two-piece cast iron valve box. The box shall be of the length as necessary to conform to the depth of the valve. Any extension sections necessary shall be provided with the valve box. Unless shown otherwise on the Plans, the valve box cover shall be marked "Water".

1.9 Check Valves

Check valves shall be iron body, bronze mounted. They shall be outside weight and lever type (unless specified otherwise by the Engineer or indicated as such on the Plans) with bronze seat, hinge and guide busting. Unless other wise indicated, check valves for interior use shall be flanged and those for exterior use shall be mechanical joint.

1.10 Automatic Air Release Valves

Air release valves shall be of the type which will automatically release air which accumulates in the pipe system. The body and cover shall be cast iron and the float shall be stainless steel. Unless otherwise indicated the valves shall be suitable for use in lines having an average working pressure of 150 psi.

1.11 Manual Air Release Valves

See "Detail Sheet" Plan Sheet for description of the manual air release valves.

1.12 Air Valve Pit

Air valves shall be installed in a pit as shown on the Plan Details.

1.13 Blowoff Assemblies

Blowoff assemblies shall be installed in accordance with the details and Specifications at the locations shown on the Plans or as directed by the Engineer for the purpose of removing any obstacles or impurities from the main. The blowoff assembly shall be connected to the main with a typical tapping saddle and corporation stop. The piping shall be 2 inch PVC installed as shown in the details with a 2 inch iron body bronze mounted gate valve and 2 piece cast iron valve box and lid marked "Water". The lid shall be secured with a pentagon lock nut.

1.14 Fire Hydrants

New fire hydrants shall be of the dry barrel type and be installed where indicated on the Drawings or otherwise directed by the Engineer. Hydrants shall be installed in such a manner as to be completely accessible and in such a position as to minimize possibilities for damage from vehicles or to pedestrians. Hydrants shall be set plumb with nozzles at least 18" above grade. The barrel shall be turned so that the pumper nozzle will face the street. When placed behind curb, the hydrant shall be set so the nozzle will be at least 12 inches from the gutter face of the curb, or at least 5 feet from the edge of the street or road where no curb exists.

Hydrants shall be supported upon a poured-in-place block of concrete as detailed. Such block shall not interfere with joint maintenance nor with proper hydrant drainage, but shall insure zero movement between the hydrant and the main.

Fire hydrants shall conform in all respects to the current Standards of the AWWA. They shall have a 6" inlet and be equipped with two (2) 2-1/2" hose nozzles and one (1) pumper nozzle; nozzles shall be standard to local governmental agencies' requirements. Each hydrant shall be equipped with traffic damage repair kits and hydrant wrenches provided for every five (5) hydrants.

1.15 Service Piping

Unless otherwise noted on plans service piping shall be high density 3/4" Polyethylene (PE 3408) tubing or approved equal.

The piping shall be Type III C 5 P 34 as designated in ASTM-D-1248 ("Polyethylene Plastics Molding and Extrusion Materials") and shall be classified as a PE 335433 according to ADTM D-3350 ("Polyethylene Plastics Pipe and Fittings Materials").

1.16 Connection to Main

Service pipe connections to the main shall be made with a tapping saddle and corporation stop as shown in the Plans.

1.17 Setters

Setters shall be Ford 70 Series with 90° brass angle meter valve and 90° coupling sized for 5/8" x 3/4" and 3/4" meter, or approved equal.

1.18 Meters

All water meters shall be 5/8" x 3/4", plastic or bronzed bodied, of the magnetic oscillating piston or rotating piston type with a working pressure of 150 psi and shall conform to the AWWA specifications for Cold Water Meters.

The main case shall be frost-proof with a single, hinged lid cover with raised characters indicating the direction of flow and manufacturers serial number. Strainers with an effective area at least double that of the main case inlet shall be of a non-corrosive material and should fit tightly against the main case.

The measuring chamber shall be of a non-corrosive material and shall be securely positioned in the main casing. Discs shall be straight reading U.S. Gallons type with a measuring capacity of 999,999 gallons. All parts shall be as non-corrosive as possible and completely encased and hermetically sealed.

Measuring accuracy shall conform to AWWA Standard C 700, latest edition. Testing will be done at Engineers request and any meter found defective shall be returned to the manufacturer for replacement or repair at manufacturer's expense.

1.19 Meter Boxes and Covers

All meters shall be installed in new concrete boxes unless otherwise shown on the plans or approved by the Engineer.

The box shall be a precast concrete vault 18" I.D. and 24" in height. The cast iron lid shall have an 11 1/2" minimum opening with "Water Meter" stamped on top.

1.20 Back Flow Preventers

Back Flow preventers shall be angle check valves installed on customer side of meter. Such valves shall be brass or ductile iron with stainless steel spring. Type shall be Ford, Mueller, or approved equal.

1.21 Connection to Customer Service Line

All connections to the customers existing service line shall be made at the meter. Setter connection only unless otherwise directed by the Engineer.

TECHNICAL SPECIFICATIONS

SECTION E

PIPING WORKMANSHIP AND CONSTRUCTION METHODS

1. EXCAVATION & GRADING

1.1 General

This section shall include all clearing and grubbing, site preparation, excavation of earth and other material, filling, site restoration and grading, and other allied work necessary for the construction required for the project.

Any construction methods not specifically outlined in these Specifications will be governed by the Kentucky Bureau of Highways Standard Specifications (Latest Revision).

1.2 Site Preparation

Prior to commencing construction operations the Contractor shall make all the provisions necessary to assure the protection of all existing improvements, both public and private. He shall protect trees, shrubs, plantings, and grassed areas and shall make provisions for maintaining public travel in an acceptable manner.

1.3 Protection of Existing Improvements

Before any excavation is started, adequate protection shall be provided for all lawns, trees, shrubs, landscape work, fences, sidewalks, hydrants, utility poles, streets, alley and driveway paving, curbs, storm sewers, ditches, headwalls, catch basins, surface inlets and all other improvements that are to remain in place. Such protection shall be provided as long as necessary to prevent damage from the Contractor's operations. Shrubs, bushes, small trees and flowers, which have to be removed to permit excavation for the water lines, shall be protected and replanted or replaced when the backfill is complete.

The Contractor shall exercise every precaution to prevent damage to property within the outside easements. He shall remove all debris and rock from the site and restore the ground surfaces, replace or repair all driveways, buildings, fences, retaining walls, etc., which are removed or damaged during construction.

Repairs, restoration or replacement of any improvements damaged or removed, whether shown on the Plans or not, shall be the obligation of the Contractor at no additional cost to the Owner.

1.4 Maintenance of Public Travel

Maintenance of all traffic shall be in accordance with any requirements of the local road department(s) and/or the Kentucky Department of Transportation. It is the responsibility of the Contractor to coordinate all work with and notify the above-named agencies, and to provide all necessary signs, barricades, lights, flagmen, and other items for maintenance of traffic.

Public travel shall be maintained, unrestricted, wherever and whenever possible. Detours shall be provided when so directed by the appropriate agency. Adequate precautions shall be taken to provide for the safety of both vehicular and pedestrian traffic. Emergency vehicles shall be provided access to construction area at all times.

Unless specifically directed otherwise by the Engineer, not more than five hundred (500') feet of trench shall be opened ahead of the pipe laying, and not more than five hundred (500') feet of open ditch shall be left behind the pipe laying. All barricades, lanterns, watchmen, and other such signs and signals as may be necessary to warn the public of the dangers in connection with open trenches, excavations and other obstructions, shall be provided by and at the expense of the Contractor.

When so required, or when directed by the Engineer, only one-half (1/2) of the street crossing and road crossings shall be excavated before placing temporary bridges over the side excavated for the convenience of the traveling public.

All backfilled ditches shall be maintained in such manner that they will offer no hazard to the traveling public and the property owners abutting the improvements shall be taken into consideration. All public or private drives shall be promptly backfilled or bridges at the direction of the Engineer. Excavated materials shall be disposed of so as to cause the least interference, and in every case the deposition of excavated materials shall be satisfactory to the Engineer.

1.5 Drainage

The Contractor shall make provisions for handling all flows in existing creeks, ditches, sewers and trenches by pipes, flumes or other approved methods at all times when his operations would, in any way, interfere with the natural

functioning of said creeks, ditches, sewers and drains. The Contractor shall at all times during construction provide and maintain sufficient equipment for the disposal of all water which enters the excavation, both in open cut trenches and in tunnels, to render such excavation firm and dry, until the structures to be built thereon are completed.

1.6 Excavation

1.6.1 General

Materials of excavation shall be unclassified and shall include whatever materials are encountered to the depth of the Plans, stated in the Specifications, or as directed by the Engineer.

1.7 Disposal of Unsuitable Materials

Excavated materials which are either surplus and not required or are unsuitable for backfilling shall be removed from the site of operations as soon as excavated.

All excavated materials so removed shall be disposed of, at no additional cost to the Owner, on sites acquired by the Contractor and approved by the Engineer.

1.8 Storage of Suitable Materials

Excavated materials suitable and required for backfill shall be stored in neat piles adjacent to the excavation in a manner so as to interfere as little as possible with traffic, but shall not be placed at such heights above or closeness to the sidewalls of the excavation to endanger such operations due to slides or cave-ins.

1.9 Open Cut Excavation for Structures

In excavation for masonry and concrete structures, the required width shall be such as to permit forms to be constructed in the proper manner and to permit proper backfilling on completion of the structures.

Depth of excavation for footings shall be as shown on the drawings and/or as directed by the Engineer to obtain sufficient bearing.

1.10 Open Cut Excavation for Pipeline Trenches

Open Cut excavation, either in earth or rock, shall be safely supported and of sufficient width and depth to provide adequate room for the construction or installation of the work to the lines and dimensions called for by the Plans.

Before laying the pipe, the trench shall be opened far enough ahead to reveal obstructions that may necessitate changing the alignment of the pipeline.

1.11 Trench Dimension

Excavations for water pipe in both earth and rock shall have a minimum allowance trench width as shown on the details which will permit good workmanship in laying the pipe and fittings, boring and jacking and compaction of backfill at the sides of the pipe, and shall be subject to approval of the Engineer.

The maximum allowance trench width shall be no greater than 2' - 0" + the outside pipe diameter except where such dimensions may prohibit any other construction such as the boring and jacking of service connections under paved surfaces.

Subgrade - the depth of excavation below the pipe - shall be 3" minimum in earth trench and 6" in rock trench unless other wise stated in the Plans and Specifications or approved by the Engineer.

1.12 Shoring, Sheering and Bracing

The Contractor shall furnish, place, and maintain adequate sheeting and bracing as may be required to support the sides of the excavation and prevent any movements of earth which could, in any way, diminish the width of the excavation to less than that necessary for proper construction, cause damage to the water line or structures, utilities, pavements, or walks, or cause injury to workmen or others through movement of the adjacent earth banks, or to otherwise damage or delay the work.

The design and installation of all sheeting, sheet piling, bracing and shoring shall be based on computations of pressure exerted by the materials to be retained under existing conditions. Adequate and proper shoring of all excavations shall be the entire responsibility of the Contractor, however, the Engineer may require the submission of shoring plans (accompanied by supporting computations) for approval prior to the Contractor undertaking any portion of the work.

1.13 Blasting

When blasting is required for the removal of rock, every precaution shall be used for the protection of persons and private and public property. The method of blasting will be as determined by the Contractor, subject to the approval of the Engineer, prior to construction.

The Contractor shall comply with all laws, regulations, and ordinances of the local governmental agencies and the Commonwealth of Kentucky relating to the transportation, storage and use of any and all explosives or blasting agents. Compliance with the above stated regulations and submittal of the method of blasting as stated above does not in any way relieve the Contractor of responsibility for any damage caused by the blasting. Any damage thus caused shall be promptly and satisfactorily repaired by the Contractor at no additional cost to the Owner.

1.14 Unauthorized Excavation

Whenever the excavation is carried beyond or below the lines and grades given by the Engineer, the Contractor at his own expense shall refill such excavated space with such material and in such a manner as will insure stability of the structure involved.

1.15 Removal of Water

The Contractor, at his own expense, shall provide adequate facilities for promptly removing water from all excavations. No water lines shall be laid in a trench which is holding water.

1.16 Backfill, Embankment, and Grading

1.16.1 General

This section includes the filling of the excavated trenches and spaces around the completed structures or pipelines to the original grades or to finished grades as indicated on the Plans.

1.16.2 Trench Backfilling in Unpaved Areas

Backfilling of trenches in open cut shall be commenced as soon as possible after the distribution main and service taps to the main

have been completed, and all jointing and alignment has been approved by the Engineer.

Selected excavated material containing no rock shall be carefully and solidly tamped around the pipe from the tip of the cradle or encasement up to a plane at least one (1) foot above the exterior of the pipe or structure. The filling of the trench shall be carried on simultaneously on both sides of the pipe in such a manner that the completed pipe line will not be disturbed and injurious side pressures do not occur. Walking or working on the completed pipe line, except as may be necessary in tamping or backfilling, shall not be permitted, until the trench has been backfilled to that height.

The Contractor may use any type of earth moving equipment he has at his disposal, provided such equipment is in satisfactory condition, and of such type and capacity that the work may be accomplished properly, the grading schedule maintained, and the required density obtained. Any questionable suitability problems relating to earth moving equipment shall be resolved by the Engineer.

The selected excavated backfill materials used between the plane one (1) foot above the ground surface may include rock fragments taken from the excavation.

In backfill containing rock, no rock fragment shall be larger than 1 cubic feet in size and all rock fragments shall be mixed with sufficient earth materials to completely eliminate all voids, subject to the approval of the Engineer. The amount of rock in the backfill shall not exceed 33% of the total backfill. Rock fragments and surplus earth materials not used in the backfill shall be removed from the site of the work.

In filling the remainder of the trench, from the plane one (1) foot above the pipe to the top of the trench, the backfill material may be shoveled into the trench without compacting, and heaped over whenever, in the opinion of the Engineer, this method of backfilling may be used without inconvenience to the public.

Before final acceptance, the Contractor will be required to level off all trenches where backfill material has been piled up, or to

bring the trench up to the level of the surrounding street, roadway, or terrain where necessary, also, the removal from the streets, roadways, and private property of all excess earth or other materials.

1.16.3 Trench Backfilling in Paved Areas

In areas where street paving is to be replaced, trenches shall be backfilled up to one (1) foot above the top of pipe or structure using the methods described above for unpaved areas. Backfill above this level shall be placed in layers not exceeding eighteen (18) inches and firmly tamped into place by tampers or rammers to 95% of Standard Proctor Maximum Density. In lieu of tamping the trench may be backfilled with granular material and puddled and jetted under the direction of the Engineer.

1.16.4 Backfill Around Structures

Sandy backfill material or selected excavated materials containing no rock shall be placed in uniform layers around air valve pits or other structures and shall be thoroughly tamped and compacted.

1.16.5 Backfill Around Iron Pipe

Selected excavated materials composed of clay, sand, gravel or other materials non-injurious to iron pipe shall be used for backfilling within 24 inches of iron pipe. Cinders, rubbish and other materials which would be injurious to iron pipe shall not be used in such backfilling.

1.17 Restoration of Ground Surfaces and Cleanup

1.17.1 General

All ground surfaces in public rights-of-way, easements and on private property that have been damaged or destroyed by the Contractor's operations shall be restored to original contours and in accordance with the following Specifications.

1.17.2 Restoration of Grassed Areas With Sod

Where so designated, all established grassed areas shall be restored with sod containing grasses of comparable quality. Sod shall be placed and rolled so that the final elevations of the area being restored are the same as existed prior to the beginning of construction. Sod shall be pegged where necessary, and shall be watered and cared for to assure its survival until final acceptance of the Project.

1.17.3 Restoration of Grassed Areas With Seed and Mulch

The Contractor shall seed and mulch all disturbed areas, unless otherwise specified, in the following manner: Rye or Fescue Seeding - The ground shall be loosened approximately 3 inches deep with a disc or harrow; fertilized with 25 pounds of 10-10-10-, or equivalent, and 100 pounds of agricultural lime per 1,000 square feet; sown at a rate of 75 pounds per acre with an approved grade of perennial rye or Kentucky No. 31 Fescue grass seed that will provide early growth during the season in which it is planted. The seed shall be well raked or boarded into the soil.

The time of application of the seed and fertilizer shall be at the discretion of the Engineer.

Unless otherwise permitted by the Engineer, vegetable materials for mulching shall be wheat, oat, barley or rye straw only. All material shall be reasonably free from weed seeds, foreign material, and other grasses and chaff, and shall contain no Johnson Grass. The straw shall be reasonable bright in color and shall not be musty, mouldy caked or of otherwise low quality. It shall be dry on delivery.

Unless otherwise specified, the bituminous material to be used for "tying down" straw mulch shall be a slow setting emulsified asphalt. It shall be non-toxic to plants.

Mulch net shall be used, if directed by the Engineer, to hold mulch in place until turf is established. The net shall be made of a tightly twisted kraft paper yarn, leno woven with a warp count of one pair of yarns per two (2) inches and a filling count of 2 per inch. Salvage edges and center shall be reinforced with

polyethylene filament. The material shall have a minimum width of 45 inches.

1.18 Cleanup

Before final acceptance of the work, the Contractor shall satisfactorily clean all areas within the limits of his operations including the street surfaces, walks, gutters, fences, lawns, private property and structures, leaving them in as neat, clean and usable condition as originally found. He shall remove all machinery, tools, surplus materials, temporary buildings and other structures from the site of work. He shall so remove all organic matter and materials containing organic matter from all areas and places used by him during construction. All sewers, manholes, inlets, etc., shall be cleared of all scaffolding, sedimentation, debris, rubbish and dirt.

Where the Contractor's operations have resulted in filling existing ditches, clogging existing culverts, damaging existing bridges, ground surfaces, sidewalks, driveways, etc., the Contract shall reditch, clean culverts, repair or replace bridges, ground surfaces, sidewalks, driveways, etc., so as to return them to a condition as good as or better than existed prior to the beginning of his operations.

The Contractor's cleanup operations, which include repair, restoration or replacement of ground surfaces and existing improvements and the removal of rock, shall be performed continuously during the construction operations.

TECHNICAL SPECIFICATIONS

SECTION F

PIPE WORK

1. PIPEWORK

1.1 General Description

After the trench is excavated to subgrade as specified, it shall be filled to the proper depth with crushed stone or concrete as specified to provide a firm and satisfactory bed, hereafter referred to as the cradle or encasement, for the entire length of the pipe barrel. Pipe of the designated class and required size shall be laid to form a closed joint with the next adjoining pipe, bringing the inverts continuously to the required depth of cover shown on the Plans. The pipe shall be laid in an upstream direction, with bells upstream, unless otherwise permitted or directed.

In no case shall water be allowed to rise in or above the pipe before the joint has become thoroughly set. No walking on or working over the pipes after they are laid, except as may be necessary in placing and compacting the backfill, will be permitted until they are covered with backfill to a depth of one (1) foot.

The trench backfill shall be placed in accordance with backfill requirements of these Technical Specifications.

1.2 Cradle and Encasement

The cradle or encasement, as required to support and protect the water pipe, shall be of crushed stone or concrete and shall be installed as specified herein or as directed by the Engineer to the dimensions as shown on the Plans.

1.2.1 Crushed Stone Cradle

Where indicated on the plans water main shall be installed with a crushed stone cradle.

Where the water pipe is to be laid in a crushed stone cradle, the crushed stone to be used shall be Kentucky Highway No. 9 or No. 78 Crushed Stone, as specified by the Kentucky Bureau of

Highways. The crushed stone shall be deposited in the excavated trench to depth shown on Plans, allowing for the pipe wall thickness and providing "bell holes" for making joints, where pipe is of the bell and spigot type. The pipe shall be laid to the depth as shown on the Plans and crushed stone shall be carefully deposited around the pipe up to a plane through the centerline of the pipe as indicated on the Plan Details.

1.2.2 Concrete Cradle

Where a concrete cradle is required as additional support for the water pipe, concrete, as specified in the Concrete Section of these Technical Specifications and Section 601 of the Kentucky Bureau of Highways Standard Specifications, shall be used. First, the water pipe shall be laid accurately to the depth indicated on the Plans, setting the pipe upon concrete blocks or saddles installed to provide both vertical and lateral supports for the pipe. The supporting of pipe on wooden blocks will not be permitted.

1.2.3 Concrete Encasement

Where a concrete encasement is specified, concrete, as specified in the Concrete Section of these Technical Specifications and Section 601 of the Kentucky Bureau of Highways Standard Specifications, shall be used. The water pipe shall be laid and supported in accordance with the Specifications for water pipe and a concrete cradle, as heretofore specified, and the concrete deposited around the pipe at the required width and depth to a plane at least 6 inches over the top of the pipe, as indicated on the Plan Details. Proper bracing of the pipe shall be provided to prevent its being floated by the concrete encasement.

1.3 Metered Service Connections

Metered service connections shall be installed to the point where the line from the customers residence or business joins the meter setter. The service piping shall be 3/4" polyethylene tubing as noted in the Piping Appurtenances Section of these Technical Specifications. They shall be installed as shown on the Plans or as directed by the Engineer.

1.4 Meter Boxes and Other Structures

Meter boxes shall be constructed as shown on the Plan Details. The concrete vault shall be placed on concrete bricks, with 6" crushed stone placed in bottom for drainage.

The cast iron lid shall be set flush with existing ground or 1/2" maximum above ground. Backfill shall be carefully tamped around both vault and lid. Vaults placed in sidewalks, driveways, or other paved surfaces shall have lids placed flush with the existing paved surfaces.

Service line depth shall be the same as the main water line with the exception that the service line may be brought up to a sufficient depth to enter the vault within 5' of the side of the vault.

Air release valve vaults shall be Type III 24" diameter Reinforced Concrete Pipe barrels set on 8 concrete bricks with 6" crushed stone in bottom for drainage. The lid shall be cast iron stamped "Water" with 24 I.D. opening. Backfill shall be carefully tamped around vault and lid. The lid shall be flush or 1/2" maximum above existing ground in unpaved areas and flush with any paved surfaces.

1.5 Branches and Fittings

Branches and Fittings shall be provided and laid as where directed.

Tapping saddles or other fittings for property service connections shall be placed on the water main at such points as to result in the property service connection having the shortest length possible between the water main and the property line unless otherwise indicated on the Plans or directed by the Engineer.

1.6 Pipe Cutting

Pipe may be cut in any manner specified by the pipe manufacturer, but only when authorized and approved by the Engineer. Where a pipe is cut the Contractor shall remove the old section of pipe satisfactorily to the Engineer.

1.7 Pipe Handling and Installation

All procedures for receiving, handling, storing and installing pipe used in the project, unless specified in these Technical Specifications, shall be governed by the Standards listed below with the approval of the Engineer.

Ductile Iron Pipe - The manufacturers printed instructions.

Polyvinyl Chloride Pipe - The manufacturers printed instructions.

Polyethylene Pipe - The manufacturers printed instructions.

1.8 Pressure Pipe Thrust Blocking

Concrete thrust blocks shall be provided to prevent movement of pipe or appurtenances in response to the forces developed by the pressure of the piping system. In general, thrust blocking shall be provided where the pipeline changes direction (e.g. tees, bends, elbows, crosses, etc.), changes size (e.g. reducers), stops at dead ends, and/or has an appurtenance (e.g. valve or hydrant) attached at which thrust develops when closed. Thrust blocks shall be sized according to the Plans.

1.9 Highway and Railroad Crossings

Steel casing pipe for road and railroad crossings shall be bored and/or jacked in place to the depths shown on the Plans. Casing pipe shall also be laid in open cut where indicated on the Drawings. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The casing pipe shall be installed without bends. The water line pipe shall be installed after the casing pipe is in place, and shall be braced within the casing with structural steel members welded into place or other Engineer approved method to preclude possible floatation.

Railroad crossing material and installation shall be in strict accordance with American Railway Engineering Association Specifications.

At each end of the casing pipe, the water line pipe shall be wrapped with two layers of roofing felt. The wrapping shall extend a minimum of 12 inches in each direction from the end of the casing pipe. After the water line has been installed, inspected, tested and wrapped as specified, both ends of the casing pipe shall be closed with brick or concrete block masonry in a manner acceptable to the Engineer.

Weep holes shall be provided in the closure at the lower end of the casing pipe to facilitate drainage and shall be located within the granular pipe bedding material. Granular bedding is not required under the open cut casing pipe; however, the Contractor shall insure that casing pipe does not bear directly on rock.

1.10 Creek Crossings

River and creek crossings shall be accomplished in a method determined by the Contractor and approved by the Engineer to the lines and grades as shown on the Plans. Piping shall be ductile iron or polyethylene pipe as per the Pipe Materials Section of these Technical Specifications and as approved by the Engineer. There are two types of creek crossings which shall be as shown on the plans and where indicated on the plans.

1.11 Pipeline Testing

1.11.1 General

Testing at the Contractor's expense of any water line section may be requested at any time by the Engineer to determine that the section is watertight.

1.12 Visual Inspection

During the final inspection the Engineer may inspect any section of the water lines by various methods at his disposal to determine whether the completed lines are true to line and grade as laid out or as shown on the Plans.

1.13 Hydrostatic Tests

After the pipe is laid and the line flushed, it shall be filled with water with care being exercised to expel all air from the pipe. During the test period all pipe, valves, fittings, and joints shall be examined carefully for defects. Any observed leaks or defective pipe shall be satisfactorily repaired or replaced, at the expense of the Contractor and the test repeated until the section tested is within the limits prescribed hereinafter. The entire distribution system or parts thereof shall be tested under hydrostatic pressure of 150 psi, or pressure class of the pipe which ever is greater, for a period of 4 hours, if joints are exposed, or for an 8 hour period if joints are covered. Repairs shall be made using approved materials and new replacement fittings, specials, or gaskets where leakages occur.

Leakage shall be measured by an approved calibrated meter through which all the water required to maintain test pressure shall be pumped. All testing shall be performed in the presence of the Engineer. Allowable leakage shall not exceed 10 gallons per 24 hours per inch of diameter per mile of pipe, at the specified test pressure.

Tests shall be completed in accordance with the latest edition of AWWA C-600 except a modified herein.

1.14 Flushing

Any foreign material left in piping during construction shall be removed by flushing system prior to testing. Flushing should be accomplished by partially opening and closing valves and hydrants several times under expected line pressure with flow velocities adequate to flush foreign material out of valves and hydrants.

1.15 Disinfection

1.15.1 General

Thoroughly disinfect all water pipe on potable water lines prior to being placed in service. Follow the applicable provisions of the procedure established for the disinfection of cast iron pipe as set forth in the latest edition of AWWA C651 entitled "Disinfecting Water Mains".

1.15.2 During the Construction

Workmen shall be required to use utmost care to see that the surface of parts of the structures, the inside of pipes, fittings, jointing materials, valves, and specials which come in contact with the local water system's water, are maintained in a sanitary condition. Every effort shall be made to keep the inside of the pipe, fittings and valves free of all foreign matter, sticks, dirt, rocks. As each joint of pipe is being laid, it shall be swabbed so that all foreign matter is removed. All fittings and exposed open ends of pipe shall be blocked or capped until the line is completed.

When the entire pipe line or certain selected sections thereof have been completed, tested and made ready for turning over to the local water system ready for use, the line or section of line shall be thoroughly sterilized according to the following procedure: The new pipe shall be disinfected by introducing HTH, Perchoron, or a similar hypochlorite solution, through taps made by the Contractor as directed by the Engineer. The water shall be turned into the mains slowly to allow a thorough mixing of the solution which shall be brought to a strength of 50 parts per million of

available chlorine. All valves shall then be closed and the sterilizing solutions permitted to remain in the pipe line sections for not less than 24 hours. At the end of the 24 hour period the water in the line must have a minimum chlorine residual of 25 parts per million, or the process shall be repeated until the residual of 25 ppm is maintained. After the required chlorine residual has been maintained the mains shall be flushed thoroughly until a chlorine residual not to exceed one (1) part per million is obtained.

No water line shall be put in service either permanently or temporarily until it has been thoroughly disinfected to the satisfaction of the Engineer. The Contractor shall be responsible for all bacteriological testing should this be required by the Engineer.

1.16 Restoration of Paved Surfaces

1.16.1 General Description

After all excavations within the limits of paved surfaces have been properly backfilled and compacted in accordance with the Plans and Specifications, the paved surfaces shall be restored to a condition as good as or better than existed prior to the beginning of the work, in accordance with the following Specifications.

1.17 City, County and State Paved Surfaces

Streets, alleys, sidewalks, curbs and gutters originally constructed by ordinance or maintained by the City, and highways, roads, and walks constructed and/or maintained by the Kentucky Department for Transportation or County, which are wholly or partially removed, damaged or disturbed by the Contractor's operations, shall be promptly restored to a condition as good as or better than existed prior to the beginning of the work. Such restoration shall be performed in accordance with the pertinent Specifications and standards of the City, the County, or the Kentucky Department of Transportation as applicable.

1.18 Other Paved Surfaces

Streets, alleys, driveways, sidewalks, curbs, and gutters, not constructed or maintained by the City, the Kentucky Department of Transportation, or the County, but paved with asphalt, concrete, cinders, crushed stone, waterbound macadam, oilbound macadam, or heterogeneous paving materials, which are

wholly or partially removed, damaged or disturbed by the Contractor's operations, shall be restored with like or better materials, acceptable to the Engineer, to a condition as good or as better than existed prior to the beginning of the work, so that movement of traffic, both vehicular and pedestrian, through the restored way shall be as free, safe and unimpeded as before.

1.19 Asphalt Roadway Paving

Existing asphalt paving in roadways shall be restored with base, binder and surfacing of the dimensions as shown in the Plans. All material shall conform to the Materials Section of these Technical Specifications and construction methods shall conform to Sections 300 and 400 of the Kentucky Bureau of Highways Standard Specifications with the approval of the Engineer.

1.20 Concrete Roadway Paving

Existing concrete paving in roadways shall be restored with the dimensions shown in the Plan Details. All materials shall conform to the Materials Section of these Technical Specifications and construction methods shall conform to Section 500 of the Kentucky Bureau of Highways Standard Specifications with the approval of the Engineer.

1.21 Driveway Replacement

For the restoration of all paved driveways disturbed by the installation of the water lines, the materials and dimensions shall be equivalent to the original paving. However, in no case shall the dimensions be less than (a) 6" DGA base and 6" Class "A" Concrete for concrete driveways and (b) 6" DGA base and 2" Bituminous Surface for asphalt driveways.

SECTION G
TECHNICAL SPECIFICATIONS
CONCRETE

1. General
2. Codes and Standards
3. References
4. Concrete Materials
5. Proportioning
6. Formwork
7. Reinforcement
8. Joints & Embedded Items
9. Production & Placing of Concrete
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16. Miscellaneous

CONCRETE

1. GENERAL

This section shall be used for all concrete work included in this Project (i.e., all structures, piping, paving, etc.).

The CONTRACTOR shall provide all labor, materials, equipment and services required to form, furnish, place and finish all reinforced and non-reinforced cast-in-place concrete work as shown on the Drawings, specified herein, or directed by the ENGINEER, including furnishing and placing all reinforcing steel and ties, waterstops, furnishing and installing precast concrete items as shown on the plans, installing all items to be built into concrete work, and repairing and patching existing concrete work which is required to be disturbed or altered in this contract.

"Specifications for Structural Concrete for Buildings" ACI 301-84 are hereby incorporated into and made a part of these contract documents by reference. All Specifications in this section shall be considered as modifications and/or supplements to ACI 301-84. The CONTRACTOR shall comply with the provisions of ACI 301-84 in the absence of other instructions or requirements contained herein. References to specific portions of ACI 301-84 are shown in parenthesis.

Whenever concrete work requirements in other sections of the General Specifications are in conflict or variance with the requirements of this section of the General Specifications, the requirements of this section shall take precedence.

The intent of these Specifications is to obtain a dense, impermeable, watertight concrete work with the required strength, and with maximum resistance to chemical attack.

2. CODES AND STANDARDS

In order to ensure that the Work to be performed under this section results in an acceptable product, the following codes and recommended standard practices shall be strictly adhered to except as hereinafter modified:

ACI 301-84 "Specifications for Structural Concrete for Buildings"

ACI 318-83 "Building Code Requirements for Reinforced Concrete"

ACI 304R-85 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete"

ACI 305R-77 "Recommended Practice for Hot Weather Concreting"

ACI 306.1-87 "Recommended Practice for Cold Weather Concreting" ACI
350R-83 "Concrete for Sanitary Structures"

ACI 347-78 "Recommended Practice for Concrete Formwork"

CRSI Manual of Standard Practice 1976

3. REFERENCES

The CONTRACTOR shall obtain and have available in the field office at all times, the following references:

- 1) Specifications for Structural Concrete for Buildings ACI Publication SP-15 (84), Field Reference Manual (includes ACI 301-84 and selected references)

Available from: The American Concrete Institute
Publications Department
P. O. Box 19150
Detroit, Michigan 48219
(313) 532-2600

- 2) Manual of Standard Practice - CRSI (73)

- 3) Placing Reinforcing Bars - CRSI

Available from: Concrete Reinforcing Steel Institute
933 North Plum Grove Road
Schaumburg, Illinois 60195
(312) 490-1700

4. CONCRETE MATERIALS

4.1 Cement (ACI 2.1)

Cement shall be Portland Cement Type I or II (ASTM C 150). The cement shall contain less than 8 percent (8%) Tricalcium Aluminate (C_3A). Certification shall be furnished for all cement in addition to mill test reports on periodic shipments.

4.2 Admixtures (ACI 2.2)

An air entraining admixture (Darex, AEA, Protex, RIW Toxement AEA or approved equal) shall be used in all concrete and shall meet the requirements of ASTM C 260. Certification attesting to the compliance of the material with ASTM C 260 shall be furnished.

Other admixtures such as set controlling water reducing admixtures, pozzolans, densifiers, set retarders, etc. may be used with the written permission of the ENGINEER, except that under no circumstances shall calcium chloride be used.

4.3 Water (ACI 2.3)

Water shall be kept free from injurious amounts of oil, acid, alkali, organic matter or other such deleterious substances. Particular attention shall be paid to conformance to the provisions of ACI 3.4.4, ACI 3.7.2, and ACI 350R Par. 3.2 concerning chloride concentrations (maximum water soluble chloride content expressed as a percent by mass of the cement and measured at the level of the steel shall be less than 0.15 per cent).

4.4 Fine Aggregate (ACI 2.4)

Fine aggregate shall consist of natural sand having clean uncoated grains, free from injurious amounts of clay, flaky material, lignite, organic material and other such foreign substances and shall meet the requirements of ASTM C 33.

4.5 Coarse Aggregate (ACI 2.4)

Coarse aggregate shall be crushed stone, gravel or slag having clean, hard, uncoated particles. It shall be free from injurious amounts of soft, friable, thin, elongated or laminated pieces and shall meet the requirements of ASTM C 33. Coarse aggregate shall be size number 57 or size number 67 as set forth in ASTM C 33.

Crushed stone is preferred for coarse aggregate; gravel (either crushed or uncrushed) or slag shall not be used unless approved in writing by the Engineer.

5. PROPORTIONING

5.1 General

Proportions for concrete shall be selected to produce concrete of the specified workability, durability, density, and strength. Proportions shall be selected in accordance with ACI 3.8 and ACI 3.9 or ACI 3.10 and in accordance with ACI 211.1-81, "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete". Documentation of the resulting concrete mix designs, including testing as required shall be in accordance to the aforementioned ACI paragraphs and shall be submitted to the ENGINEER for review and approval.

5.2 Strength (ACI 3.2)

All concrete shall have a minimum compressive strength of 4000 lbs/sq. in. at twenty-eight (28) days.

5.3 Air Content (ACI 3.4.1.)

Air content shall be six (6) percent, +/- one (1) percent by volume.

5.4 Slump (ACI 3.5)

Slump shall be in accordance with ACI Section 3.5 (4" maximum) for concrete of the basic mix design containing no admixtures other than an air-entraining agent.

The slump may be adjusted by the concrete supplier through the use of approved admixtures, within the ranges given in the following table, to facilitate the Contractor's construction methods, provided the Engineer or his representative is notified of the type of admixture 48 hours prior to the arrival of concrete on the jobsite. The slump limits listed in the table shall be absolutes, except for super-plasticized concrete, and in no case shall the water/cement ratio exceed that given in section 5.6 of these specifications.

Recommended Slumps for Various Types of Construction¹

| Type of Construction | Slump, In. | | Minimum |
|---|------------|---|---------|
| | Maximum | | |
| Reinforced foundations and footings | 5 | 2 | |
| Plain footings, caissons, and substructure walls | 4 | 1 | |
| Slabs, beams, and reinforced walls | 6 | 3 | |
| Building Columns | 6 | | 3 |
| Pavements | | 3 | 2 |
| Heavy mass construction | 3 | | 1 |

¹From ACI Standard (613-44), Recommended Practice for Design of Concrete Mixtures.

5.5 Maximum Size of Coarse Aggregate (ACI 3.6)

Coarse aggregate shall be Size No. 57 (1 inch nominal maximum) or Size No. 67 (3/4 inch nominal maximum) conforming to ASTM C 33 as herein before specified.

5.6 Selection of Proportions (ACI 3.8)

In Summary, the concrete mix shall be proportioned in accordance with ACI 3.8 and ACI 3.9 or ACI 3.10 to meet the following specifications:

4000 psi compressive strength at 28 days.

Type I or Type II cement (cement dispersing agent permitted; Tricalcium Aluminate [C_3A] content less than 8%).

Maximum water/cement ration = 0.42.

Minimum cement content - 564 lbs. (6 bags/cubic yard of concrete).

Maximum size coarse aggregate = No. 57 (1 inch nominal maximum).

Air content = 6 percent \pm 1 percent by volume.

Slump = 4" maximum when measured in accordance with ASTM C 143.

Maximum water soluble chloride content = 0.15 percent by mass of cement measured at the level of the steel.

6. FORMWORK

6.1 General

Formwork shall conform to the provisions of ACI Chapter 4 and to the "Recommended Practice for Concrete Formwork" (ACI 347-78). Shop drawings and calculations for formwork will not be required unless specifically requested by the ENGINEER.

6.2 Design and Installation of Formwork

Particular attention shall be paid to the provisions of ACI 4.2.3. Formwork or formwork materials which in the opinion of the ENGINEER cannot produce

surface finishes as required in ACI 10.2, or ACI 10.3 or as specified herein shall not be used.

6.3 Form Ties

Form ties shall be of the "snap-off" type, shall remain in the walls, and shall be equipped with a waterseal to prevent passage of water through the walls. Minimum setback of form ties shall be 1 inch from faces of the wall. The hole left by removal of tie ends shall be sealed and patched as per ACI 9.3 and Section IV.10 of the Specifications.

6.4 Chamfering

All exposed edges shall receive a 1 in., 45 deg chamfer.

6.5 Removing Forms

Forms shall be removed by the CONTRACTOR when and as directed by the ENGINEER. Forms on surfaces that are to be given a "smooth rubbed" finish shall generally be removed within 18 to 36 hours so that the proper finish can be obtained unless otherwise directed by the ENGINEER (ACI 4.5.1). Forms and falsework supporting the weight of concrete in beams, slabs, and other structural members shall not be removed until the concrete has reached a compressive strength of at least 2/3 of the specified 28-day compressive strength.

6.6 Reshoring (ACI 4.6)

Reshoring will not be permitted.

7. REINFORCEMENT

7.1 General

Prior to ordering reinforcing steel, the CONTRACTOR shall furnish the ENGINEER shop drawings showing a complete schedule of the bars and the fabrication that is required and shall have the approval of the ENGINEER before fabrication per ACI 5.1.

7.2 Deformed Bars and Welded Wire Fabric

Reinforcing steel shall meet the requirements of ASTM A 615, Grade 60. Welded wire fabric (ACI 5.2.5) shall meet the requirements of ASTM A 185 of the size indicated on the Drawings, and shall be furnished in flat sheets only. The concrete shall be placed up to the level of the reinforcing fabric position;

then the flat sheet of wire fabric shall be placed on the wet concrete; then the remaining wet concrete topping shall be added and vibrated into the base pour in accordance with ACI 5.5.5.

The welded wire fabric may be supported in position on the ground with masonry blocks as described in ACI 5.5.3., subject to the approval of the ENGINEER. No other method of placing the wire fabric is acceptable.

Reinforcing for slabs and beams shall be supported in the forms by factory-made wire bar supports, "Class A", furnished and installed in accordance with BAR SUPPORT Specifications section of the Manual of Standard Practice as published by Concrete Reinforcing Steel Institute, Chicago, Illinois.

7.3 Placing Reinforcement

Reinforcement shall be placed in accordance with ACI 5.5. Before any concrete is placed, the ENGINEER shall have inspected the formwork and placing of the steel reinforcement and given permission to deposit the concrete. Concrete placed in violation of this provision will be rejected and thereupon removed.

8. JOINTS AND EMBEDDED ITEMS

8.1 Construction Joints

Construction joints shall be in accordance with ACI 6.1. All joints subject to hydrostatic pressure shall be provided with continuous waterstops. Construction joints shall be located as shown on the plans unless otherwise approved or directed by the ENGINEER. Construction joints shall be keyed except as specifically shown in the plans as "roughened" construction joints (ACI 6.1.4.3)

8.2 Preformed Expansion Joint Filler (ACI 6.2.2.)

Where required, joint filler material shall be preformed non-extruding resilient bituminous type conforming to the requirements of ASTM D 1751.

8.3 Waterstops (ACI 6.3.)

Continuous waterstops shall be provided in all construction and/or expansion joints in liquid containing structures. Other locations for waterstops shall be as shown on the Drawings or where directed by the ENGINEER. Waterstops shall be made continuous around the entire structure or throughout the depth of the joint.

Waterstops shall be extruded from an elastomeric polyvinyl chloride compound with a minimum tensile strength of 2000 psi + 50, and shall not contain any scrap or reprocessed materials. Waterstops shall generally be 6" wide with a 3/16" web thickness, except where manufacturer's recommendations and/or good construction practice shall dictate a larger or smaller size, or where a different size shall be called out on the Contract Drawings. Serrated split with centerbulb are to be used in expansion joints and dumbbell type are to be used in construction joints as shown on the plans. They shall be securely wired in place to maintain proper position during concrete placement. All field splices shall be heat fused with a thermostatically controlled electric heat source as recommended by the manufacturer unless prefabricated glue-socket splices have been submitted and approved by the Engineer.

All materials shall be Greenstreak Plastic Products Company (St. Louis, Missouri), or approved equal, and shall be installed in accordance with the manufacturer's recommendations.

8.4 Built-In-Items

The CONTRACTOR shall be responsible for placing all sleeves, wall castings, anchor bolts, and other inserts in the concrete work in their proper positions. CONTRACTOR shall verify that all such inserts to be embedded are in place prior to placing of concrete. The embedment of aluminum conduit in concrete construction will not be permitted.

9. PRODUCTION AND PLACING OF CONCRETE

9.1 General

Production and placing of concrete shall conform to the provisions of ACI Chapter 7 and ACI Chapter 8, and to the "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete" ACI 304-73. In addition, the ENGINEER shall inspect and approve the proposed concrete production facility well in advance of any concrete placing operations.

9.2 Transporting Concrete

Concrete shall be conveyed from the mixing site to the placing site in accordance with ACI 8.2 with the exception that nonagitating trucks shall not be used for transporting "Ready-mixed" concrete. In all cases, concrete shall be delivered to the placing site within 1 1/2 hours, or before the mixing or agitating drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the other ingredients per ASTM C 94.

The producer of the concrete shall furnish to the contractor with each batch of concrete, before unloading at the site, a delivery ticket, on which the following information shall be shown:

1. Name of ready-mix batch plant,
2. Serial number of ticket,
3. Date,
4. Truck number,
5. Name of purchaser,
6. Specific designation of job (name and location),
7. Specific class or designation of the concrete in conformance with that employed in the job specifications,
8. Amount of concrete in cubic yards,
9. Time loaded or of first mixing of cement and aggregates,
10. Type and brand, and amount of admixtures,
11. Allowable water which may be added at the site without exceeding the total mixing water of the mix design. Total mixing water shall include the free water on the aggregates, water and ice batched at the mixing plant, and water added by the truck operator from the mixer tank,
12. Amount of water added by the receiver of the concrete and his initials,
13. Signature or initials of ready-mix representative.

9.3 Hand Mixing

Hand mixing concrete will not be permitted except in case of emergency and only at the specific direction of the ENGINEER.

9.4 Retempering

Retempering concrete will not be permitted except in case of emergency and only at the specific direction of the ENGINEER.

9.5 Weather Conditions

9.5.1 Cold Weather (ACI 7.6.1)

All methods and materials used for cold weather concreting shall be in accordance with the requirements of recommended practice for "Cold Weather Concreting" (ACI 306R-78), and shall be subject to the approval of the ENGINEER.

9.5.2 Hot Weather (ACI 7.6.2)

All methods and materials used for hot weather concreting shall be in accordance with the requirements of recommended practice for "Hot Weather Concreting" (ACI 305R-77), and shall be subject to the approval of the ENGINEER.

9.6 Bonding

9.6.1 Bonding at Construction Joints

Bonding of new concrete to hardened concrete at construction joints shall be in accordance with the provisions of ACI 8.5. All horizontal joints shall be sluiced with a thin coat of grout (one part cement - 2 parts sand) immediately before placing fresh concrete.

9.6.2 Bonding New Concrete to Existing Construction

When new concrete is to be bonded to existing construction, the surface of the existing concrete shall be roughened and cleaned of all dust, loose concrete, laitance, grease, or other foreign materials. Prior to pouring new concrete, the entire contact area between new and existing concrete shall be coated with a bonding compound such as "Colma Bonding Compound" as manuf. by the Sika Chemical Corp., Passaic, N.J.; "Thorobond" as manuf. by Standard Dry Wall Products, Inc., New Eagle, Pa.; "Hornbond" as manufactured by the Dewey and Almy Chemical Div. of W.R. Grace and Company, Cambridge Mass.; or approved equal. Preparation and application of such bonding compounds shall be in strict accordance with the manufacturer's recommendations.

Reinforcing bar dowels shall be installed as shown in the plans to provide a positive connection between existing construction and new concrete. Dowels shall be installed using an approved bonding system such as HVA Adhesive Anchor System as manuf. by HILTI Fastening Systems, Tulsa, OK; Anchor-It as manuf. by Adhesives Technology Corp., Kent, WA; or approved equal. Embedments shown on the plans are approximate and are subject to manufacturer's recommendations for the specific product to be used and to the ENGINEER's approval.

10. REPAIR OF SURFACE DEFECTS

10.1 General

Repair of surface defects (including holes due to removal of tie ends) shall be made in accordance with ACI Chap. 9 except as herein modified.

10.2 Repair of Defective Areas (ACI 9.2)

For structures holding water or sewage, where water tightness and durability are of primary importance, surface defects (including holes due to removal of tie ends) shall be cleaned of all loose concrete, dust, laitance, grease and other foreign materials and shall be patched with a two-component, epoxy-resin patching compound such as "Colma-Dur" as manufactured by the Sika Chemical Corp., Passaic, N.J.; "Epolith Patcher" as manuf. by the Sonneborn Chemical and Refining Corp., New York, N.Y.; or approved equal. The patching operation shall be conducted in strict accordance with the manufacturer's recommendations.

Cracks which may be subject to future movement shall be cut out to a depth of at least one inch, cleaned, and patched with "Igas" or "Colma Joint Sealer" as manuf. by Sika; "Sonolastic Sealant" as manuf. by Sonneborn; "Thorospan" as manuf. by Standard Dry Wall Products, Inc.; or approved equal rather than the aforementioned two-component epoxy-resin patching compound.

10.3 Repair of Existing Concrete

Where shown in the plans or as directed by the ENGINEER, defects in existing concrete shall be repaired using the procedures as specified in Section 4.10.2.

11. FINISHES

11.1 General

Concrete finishes shall conform to the provisions of ACI Chapter 10 and shall be as specified in the following finish schedule:

Exposed formed surfaces: "Cork floated finish" as specified in ACI 10.3.3.

Other formed surfaces : "Smooth form finish" as specified in ACI 10.2.2.

11.2 Exposed formed surfaces shall include inside surfaces of liquid containing tanks to one foot below Normal Water Level as shown on the Plans or as directed by the Engineer.

- 11.2.1 "Cork floated finish" shall be accomplished by removing the forms at an early stage, within 2 to 3 days of placement where possible. Remove ties. Remove all burrs and fins. Patch wall tie holes in accordance with section 10.2.1 of the Contract Specifications. Mix one part portland cement and one part fine sand with sufficient liquid bonding agent (Acryl 60 or approved equal) to produce a stiff paste. Dampen wall surface. Apply paste with a firm rubber float or with trowel, filling all surface voids. Compress paste into voids using a slow-speed grinder or hand stone. If the surface dries too rapidly to permit proper compaction and finishing, apply a small amount of water with a fog sprayer. Produce the final texture with a cork float using a swirling motion.

12. Slabs (ACI Chapter 11)

12.1 General

Concrete for slabs shall be proportioned as hereinbefore specified.

12.2 Subgrade (ACI 11.2)

Where floors, pavements or walks are supported on earth, the subgrade shall be compacted to at least 95 per cent of the maximum standard Proctor density.

When shown on the plans or set forth in the Specifications, a subbase of compacted crushed stone shall be placed on the subgrade before beginning the concrete work. Subgrade or subbase shall be moist in accordance with ACI Par. 11.2 before beginning concrete placement.

12.3 Finish (ACI 11.7)

Finishes for slabs, sidewalks, and floors shall be as follows:

Floor Areas in Control Building and Maintenance Shop - See Architectural Specifications

Exterior sidewalks and steps - "Broomed" finish as specified in ACI 11.7.4

Slabs in Tanks, etc. which are to receive a grout topping - "Scratched" finish per ACI 11.7.1

All other slabs - "Floated" finish as specified in ACI 11.7.2

13. CURING AND PROTECTION

13.1 General

Concrete shall be cured by the methods set forth in ACI 12.2 and the "Standard Practice for Curing Concrete" (ACI 308-81). The use of membrane curing compounds is permitted as specified in ACI 12.2.1.7 for areas where such use will not interfere with the finishing operations or impair the finish specified for the concrete. Under no circumstances shall membrane curing compounds be used on any surface against which additional concrete, grout, or other material is to be bonded, for example tank bottoms which will receive a grout topping. Clear membrane curing compounds used shall contain a fugitive dye to aid in verifying proper application and shall be applied in accordance with the manufacturer's recommendations.

14. TESTING

14.1 General

Testing of concrete shall be as specified in ACI 301-84 Chapter 16 except as hereinafter modified and shall be performed by the CONTRACTOR or his designated representative.

14.2 Methods and Frequency of Tests

Methods of testing shall be as specified in ACI 16.3; with the following modifications:

1. Non-reinforced concrete shall require only slump, air content and temperature tests, unless the amount placed shall exceed 50 cubic yards in any one placement order; in which case the requirements for testing shall be the same as for reinforced concrete.
2. Reinforced concrete shall have slump, air content, and temperature tests performed for each 25 cubic yards or part thereof placed at any one time. Additionally, for each 25 cubic yards or part thereof placed as a discrete placement on any one day, a set of at least three (3) standard six (6) inch test cylinders shall be made; two of which shall be broken at twenty-eight days for acceptance, and one at seven days for information.
3. Strength test requirements for concrete may be waived at any time at the discretion of the ENGINEER. However, slump tests per ASTM C 143, and air content tests per ASTM C 231, ASTM C 173, or ASTM C 138

are required whether or not strength test requirements have been waived. Adjustments to water in the concrete and/or the proportions of the other ingredients of the mix shall be made if necessary to obtain concrete of the specified consistency, workability, strength, density and durability.

14.3 Testing for Watertightness

The CONTRACTOR is expected to provide impermeable, watertight concrete and joints in structures designed to hold water, sewage or other solutions, in drywells and basements of buildings and in all other structures where leakage into or out of the structure is undesirable. To this end, structures required to be watertight shall be tested in the following manner:

When any honeycomb, cracks or other imperfections have been patched in accordance with Section IV.10, and the concrete work in the liquid retaining structure to be tested has attained sufficient strength, the CONTRACTOR shall fill the structure with water. If the water level falls more than 1/2 inch in 24 hours, the cause of leakage shall be determined and repaired. All visible leaks shall also be repaired, even though the test for watertightness has been met. All repair work required as a result of the tests for watertightness shall be at the CONTRACTOR's expense.

15. EVALUATION AND ACCEPTANCE OF CONCRETE

15.1 General

Evaluation and acceptance of concrete shall be per ACI Chapter 17 with the following exceptions to ACI 17.2. The average of any three consecutive 28-day strength tests shall be equal to or greater than the specified strength, and not more than 10% of tests shall have values less than specified strength. In no case shall a test have a value less than 90% of specified strength. In the event test results do not meet specification requirements, the CONTRACTOR, at his own expense, shall take such measures as the ENGINEER shall prescribe or shall remove defective work as directed by the ENGINEER.

16. MISCELLANEOUS

16.1 Concrete Foundations for Equipment

Concrete pads required for mechanical and electrical equipment as shown in the Plans or Specifications shall be included in this Work, and shall be constructed as hereinbefore set out. Bolts, anchors, piping, etc. shall be set as required by the manufacturer of the equipment.

16.2 Anchor Bolts and Machinery

Unless otherwise shown or specified, grouting of anchor bolts shall be accomplished with a non-shrink, non-metallic grout such as "Masterflow 713" as manuf. by the Master Builders Company, Cleveland, OH; Five Star Grout as manuf. by U.S. Grout Corp., Fairfield, Connecticut or approved equal. Grouting shall be in strict compliance with the manufacturer's recommendations.

16.3 Precast Concrete

Precast concrete items shown in the plans shall be manufactured at an approved precast/prestressed concrete production facility. The CONTRACTOR shall be responsible for all materials, labor, bearing devices, joint seals, embedded items, etc. necessary to furnish and install the precast concrete work as shown on the plans or otherwise specified.

Materials and installation shall conform to all applicable provisions of the Specifications as hereinbefore set out.

Precast pump stations, wet wells and manholes shall be designed to withstand internally applied hydrostatic forces as well as externally applied soil and water pressure assuming that the normal groundwater table is at 1 foot below finished grade. The design shall conform to the applicable provisions of ACI 318-83, "Building Code Requirements for Reinforced Concrete" and ACI 350R-83, "Concrete Sanitary ENGINEERING Structures". Positive means of sealing joints between individual sections shall be provided to prevent leakage into or out of the finished structures, and the CONTRACTOR is hereby reminded that the watertightness provisions of Section IV 14.3 apply to this work.

Shop plans shall be submitted to the ENGINEER and approval received prior to Fabrication.

TECHNICAL SPECIFICATIONS

SECTION H

UNDERGROUND PACKAGED BOOSTER PUMP STATION

1. SCOPE OF WORK

- 1.1 The contractor shall furnish and install one (1) factory built, factory delivered, underground water booster pump station, with all necessary internal piping, pumps, motors, valves and controls and other necessary appurtenances as shown on the plans and specified herein. The underground water booster station shall be complete when delivered and will not require internal contractor construction except to install the power service through the service conduit provided for that purpose.
- 1.2 The underground water booster pump station shall be manufactured by Engineered Fluid, Inc. (EFI), Centralia, Illinois, represented by Delaney & Associates, Inc., telephone 606-342-4944 or equivalent.

2. QUALITY ASSURANCE

- 2.1 The equipment and materials covered by these specifications are intended to be standard equipment of proven reliability and as manufactured by reputable manufacturers having experience in the production of such equipment. The equipment furnished shall be designed, constructed, and installed in accordance with the best practices and methods and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.
- 2.2 It is intended that the manufacturer of the specified equipment shall be a business regularly engaged in the manufacture, assembly, construction, start-up and maintenance of water distribution equipment of the type required for this project. The manufacturer shall have at least ten (10) years of successful experience in providing stations of the type, design, function and quality as required for this project. As such, the pump station manufacturer shall be required to affix a UL (Underwriter's Laboratories) label to the assembled equipment attesting to acceptance of that equipment under UL 25BL standards. Equipment manufactured without this UL 25BL label or equipment manufactured by an outside source or "brokered equipment" defined as systems not assembled on the premises of the named manufacturer by that company's employees WILL NOT be allowed.

3. SUBMITTAL

- 3.1 Equipment submittals shall be bound and in a minimum of six (6) copies. The submittals shall contain a minimum of two (2) full size drawings, size 24" x 36"; one (1) each covering the booster pump station and the electrical control schematic. The booster pump station drawing shall be specific to this project, in at least three (3) different views, be to scale and illustrate the National Electrical Code (NEC) clearances per Section 110-16 of the Code. The submittal booklets will be complete with data sheets covering all individual components that make up the booster pump station and the UL file number under which the manufacturer is listed, service department personnel statement as detailed in the specifications and be complete with the manufacturer's formal warranty policy. The submittal booklets shall be complete with a full size photocopy of the manufacturer's combination UL/manufacturer logo UL 25BL Factory Automation Equipment label.

4. EQUIPMENT CAPSULE

- 4.1 The equipment capsule size as shown on the drawings for this project is appropriate for National Standard mandated clearances and for proper clearances above, below and around equipment to provide for safe servicing, removal and reinstallation of that equipment.
- 4.2 Likewise, the entrance manway and/or equipment hatches shall be sized to provide eventual removal and replacement of any component within the station without altering the station to accomplish task.
- 4.3 The drawing for this equipment illustrates centerline and clearance/maintenance dimensions about major equipment items. These dimensions are minimum. Dimensions less than those shown will not be accepted.

5. EQUIPMENT CAPSULE - CONSTRUCTION

- 5.1 The plate steel employed throughout the capsule shall be 1/4" minimum thickness and meet or exceed the requirements for ASTM A-36. The structural shapes employed shall meet or exceed the requirements for ASTM A-36. Field welding to complete the capsule or attach the entrance hatch will not be allowed.
- 5.2 The plate forming the top and bottom of the capsule shall be cold formed prior to assembly so as to form a lap joint with the side wall. The lap joint shall be continuously welded on the interior by hand and the exterior by machine to form an airtight seal. The lower side wall continuous weld shall be an average 1½ inches above the capsule floor, which removes the lower weld from incidental water impingement. Capsules without lap

joints will not be accepted.

- 5.3 The lap joint shall be in full conformance with Steel Tank Institute (STI) P-3 specifications Section 4.2.6 and Underwriters Laboratories (UL) 58 specifications for steel vessels in buried service, and the American Welding Society (AWS) Structural Welding Code, Section 9.10, for dynamically loaded structures.
- 5.4 Any ferrous metal device passing through the capsule wall will be welded fully along its circumference or length on both sides of the capsule wall.
- 5.5 The capsule shall be a rolled, vertical cylinder and have an outside diameter of 11 feet 0 inches and an inside clear height of 7 feet 3 inches.
- 5.6 The bottom of the capsule shall be reinforced by two (2) C8x11.5 channels in parallel. There shall also be ten (10) C6x8.2 channels in parallel, placed perpendicularly to the C8x11.5 channels. The top of the capsule shall be reinforced by 4 inch x 4 inch x 1/4 inch angles, as shown on the plans for this item.
- 5.7 Four (4) lifting plates of 3/8 inch minimum thickness shall be placed about the perimeter of the capsule to facilitate the lifting and handling of the station. Interior lifting eyes shall be placed over each piece of equipment in excess of 60 pounds in weight.
- 5.8 The entrance manway shall be Bilco Model MNB-50 roof scuttle, with a minimum clear inside opening of thirty (30) inches x fifty-four (54) inches. The scuttle cover shall be made of 11 gauge aluminum on the exterior. The scuttle cover shall be insulated with a minimum of one (1) inch of fiberglass insulation, covered and protected by an 18 gauge aluminum liner.
- 5.9 The entry lock shall be flush mounted, in the scuttle riser, in position to be protected from the elements by the cover skirt as detailed on Bilco Drawing 6184. The lock will be of the pin tumbler type, dead bolt, with an inside safety release. Two (2) keys will be provided, on a key ring complete with the manufacturer's identification. No locking devices or other penetrations of the cover shall be allowed.
- 5.10 An all aluminum access ladder will be provided. The ladder shall meet UL approval and OSHA qualifications under the Type I, Heavy Duty Specifications. The ladder will have 1-1/4" diameter, tempered, serrated rungs with 3" x 1-1/8" full I-Beam side rails. The uppermost ends of the side rails will be protected by plastic caps bolted into place. The complete access ladder will be bolted into place, at a minimum of two (2) points both top and bottom, so as to be easily removable to facilitate equipment maintenance.
- 5.11 The capsule will be complete with a sump. The sump shall be a minimum of eighteen

(18) inches in diameter x eight (8) inches deep; the sump shall be provided with a four (4) inch plugged outlet for gravity outflow as required.

- 5.12 The capsule walkway areas (that space from the entrance ladder to the control panel and the entire NEC clearance area) shall be covered with a Nyracord industrial safety matting. The mat shall be a heavy duty, 1/2 inch minimum thickness Nyracord compound (rubber blend with fiber reinforcement) of open slot design with a ribbed safety pattern (ribbed in two directions) to promote sure footing. The underside of the safety mat shall also be ribbed (in one direction only) to permit aeration and drainage. The safety mat shall not be glued to the floor surface.

6. CORROSION PROTECTION

- 6.1 All surfaces of the entire structure shall be gritblasted equal to commercial blast cleaning (SSPC-SP6).
- 6.2 The protective coating shall take place immediately after surface preparation. The protective coating shall be Tnemec Series 66 Hi-Build Epoxoline consisting of a two-component, high solids, amide-cured epoxy system formulated for high build application having excellent chemical and corrosion resistant properties. The epoxy system shall be self-priming and require no intermediate coatings. The protective coating shall provide in two (2) applications a total dry mil thickness of 8.0 mils.
- 6.3 The station manufacturer shall furnish four (4) seventeen pound packaged magnesium anodes for cathodic protection. The anodes shall be buried equally spaced around the station and connected by heavy copper wire to lugs on the station provided for that purpose.

7. OPERATING CONDITIONS

- 7.1 The pump station shall be capable of delivering the fluid medium at the following capacities and heads when operating at 0 feet minimum suction pressure.

PUMP #1 & #2

Design GPM 350 @ 80 feet TDH;
Maximum GPM 560 @ 30 feet TDH;
Efficiency at design GPM 77%.

- 7.2 The pump driver shall be a standard, A.C. induction motor, open drip-proof construction, of the horizontal extended shaft, normal thrust type and shall be 15 h.p., 3500 rpm and suitable for 3 phase, 60 cycle, 460 volt electrical service.

8. BOOSTER PUMPS - HORIZONTAL END SUCTION, CENTRIFUGAL TYPE

- 8.1 The booster pumps must be installed and hydrostatically tested prior to the station delivery.
- 8.2 The pumps employed within the pump station shall be of the horizontal end suction, centrifugal type. The pumps shall be of close grain cast iron construction complete with bronze trim. The pumps shall conform to the detailed specifications as set forth below:
- 8.3 CASING - Volute type, bolted to adapter, with recessed lock fit to insure alignment. No stud or bolt holes are tapped through casing to liquid ways. Tapping openings provided for priming, venting, draining and suction and discharge gauge connections. Piping connection to be as shown per pump data sheets.
- 8.4 IMPELLER - Enclosed, single suction type, cast in one piece. All impellers are to be statically balanced to insure smooth operation, also hydraulically balanced except in some small sizes where end thrust is but a minor factor.
- 8.5 WEARING RINGS - Renewable type; maintain proper running clearance with impeller hubs to minimize leakage between suction and discharge.
- 8.6 SHAFT SLEEVES - To be shouldered on shaft near impeller and covers full length of shaft from impeller hub to motor end bracket. Seals by compression between shaft sleeve and impeller hub, also between sleeve and shoulder on shaft, protecting shaft from contact with liquid.
- 8.7 STUFFING BOX - The stuffing box shall be cast integral with the pump casing. The stuffing box shall contain a single face type mechanical seal. The seal shall have a carbon rotating head against a Ni-Resist stationary face and be complete with a Buna-N boot with stainless steel spring and spring retainer.
- 8.8 ADAPTER - Maintains rigid assembly between motor and casing. Machined lock between adapter and motor end bracket keeps adapter and casing in permanent alignment with motor and extended motor shaft.
- 8.9 MOTOR - Assembled as integral part of the complete units. Shaft carries impeller and sleeve. Motor bearings are ball bearing type, designed to carry all radial and thrust loads, and are installed in sealed housings which retain lubricant and exclude dirt and moisture. Motors shall be open drip proof.

9. PUMP/MOTOR VIBRATION ISOLATION PADS

- 9.1 The pump/motor assembly shall be mounted to a fabricated steel base built specifically for the pump/motor to be mounted. Each mounting or attachment point shall be complete with a vibration isolation pad. The pad will be in two (2) parts, a 1/4" base layer followed by a 5/8" upper layer and be a nominal 2" x 2" square size for pump/motor combinations weighing up to 1500 pounds. The mounting or hold down bolts at each base attachment point shall be complete with washer of appropriate size made of the same material and thickness as the 5/8" upper layer pad.

10. ELASTOMER PIPE CONNECTOR

- 10.1 The inlet side of each booster pump shall include an elastomer connector to help isolate vibration and noise in the piping system. The elastomer connector shall be of single sphere design, constructed of neoprene and nylon with bias-ply tire reinforcing cord to provide a 225 psi working pressure rating to a minimum of 120°F. The elastomer connector shall pass through the plate steel flanges designed to grip the connector so the connector seals without gaskets when the flange bolts are drawn up.
- 10.2 A control joint limiting pipe connector movement shall be supplied with each pipe connector.

11. PIPING

- 11.1 Piping shall be steel and conform to material specification ASTM A-53(CW) for nominal pipe size four (4) inch and smaller and ASTM A-53(ERW) Grade B for nominal pipe size five (5) inches and larger. Steel butt-welding fittings shall conform to material specification ASTM A-234 Grade WPB and to the dimensions and tolerances of ANSI Standards B16.9 and B16.28 respectively.
- 11.2 Forged steel flanges shall conform to material specification ASTM A-105 Class 60 and/or ASTM A-181 for carbon steel forgings and to the dimensions and tolerances of ANSI Standards B16.5 as amended in 1992 for Class 150 and Class 300 flanges.
- The piping sizes shall be as shown on the drawing.
Size 10 inch and below - Schedule 40
Size 12 inch and above - Standard weight (.375" wall)
- 11.3 All pipe welds shall be performed by certified welders employed by the pump station manufacturer. As part of equipment submittal, the pump station manufacturer shall provide copies of the welding certificates of the employees who are to perform the pipe welds.

- 11.4 All piping surfaces shall be prepared by sandblasting, or other abrasive blasting, prior to any welds taking place. Piping of 5" diameter and smaller may be cut by saw. Piping of 6" diameter and larger shall be bevel cut, and Oxyfuel or Plasma-arc cutting techniques shall be used to assure and facilitate bevel pipe cuts. No saw cuts or other form of abrasive cut-offs are allowed on 6" and larger diameter pipe.
- 11.5 In all cases, short circuit transfer, spray transfer or pulse-arc transfer modes of the gas metal arc welding process shall be applied semi-automatically. When utilizing the short circuit mode, shielding gas consisting of 50% carbon dioxide and 50% argon gas shall be used. When utilizing the spray or pulse-arc transfer modes, a shielding gas consisting of 5% carbon dioxide and 95% argon shall be used. In all cases, welding wire with a minimum tensile strength of 70,000 psi shall be employed. All flange welds and butt welds of equal size pipe shall be a single continuous nonstop weld around the complete circumference of the pipe. Whenever possible, vertical up weld passes will be applied to all pipe welds. No vertical down weld passes will be allowed. Completed welding assemblies shall create no internal obstruction, restriction or create any unintended sources of water deflection.
- 11.6 Piping of six (6) inch diameter and larger shall require a minimum of two (2) weld passes to complete each weld. The first pass, or root pass, shall be applied at the bottom of the bevel cut using the short circuit transfer welding mode, and the second pass, or cap pass, shall be applied over the root pass using the spray or pulse arc transfer welding modes to insure that at a minimum the total weld thickness shall be equal to thinnest of the two pieces being welded together.

12. PIPE SUPPORTS

- 12.1 Pipe supports by minimum sizing for:
- 4" and smaller piping shall be 2" x 2" x 3/16" wall rectangular tubing;
 - 6" through 12" piping shall be 3" x 3" x 1/4" wall rectangular tubing;
 - 14" through 24" piping shall be 4" x 4" x 1/4" wall rectangular tubing and, also;
 - 6" and larger piping shall be provided with "kick" bracing projecting fully from the underside of the pipe to the floor at an angle of no less than 15° from vertical out at a right angle to the run of the pipe being supported. These "kick" braces shall be in addition to the vertical pipe supports called out above.
- 12.2 Pipe supports are to be fully welded at both end points to the pipe and steel floor where required.

Simple pipe stands made of pipe welded only at the floor and upholding a yoke or bracket with or without a threaded jack bolt or a U-bolt are not acceptable, as no lateral or transverse support is provided.

13. FUSION BONDED EPOXY COATING - STEEL TRANSMISSION PIPING

13.1 Steel transmission piping shall have applied to it a Fusion Bonded Epoxy Coating on the interior pipe surface that conforms to AWWA C-213-91 for steel water pipelines. The powder coating product shall be National Sanitation Foundation (NSF) Standard 61 certified material. The final product shall be capable of meeting Salt Spray Resistance ASTM B117 (1000 hour) with no blistering, undercutting or rust bleed; Humidity Resistance ASTM D2247 (1000 hour) with no blistering, undercutting or rust bleed; and Impact Resistance of ASTM G14-72 (160 in. lbs.)

13.2 Prior to shipment of the station, the station manufacturer shall provide in writing to the Engineer certification that the proper fusion bonded epoxy coating has been applied to all internal surfaces of the steel piping using the proper method. Said certification shall show under the station manufacturer's letterhead:

- Date of application;
- Material manufacturer and product designation including a product data sheet for the coating;
- Applier of the fusion bonded coating, name, address and phone number;
- Notarized signature of an officer of station manufacturing company stating the fusion bonded epoxy coating was applied to AWWA Standard C213-91 or the latest revision.

14. SERVICE CONNECTIONS ON INTERNAL PIPING

14.1 All plumbed devices within the station eventually requiring service, such as meters, control valves, pumps and like equipment, shall be easily removed from the piping by the presence of appropriately placed and sufficient quantity of adaptors and couplings as shown on the drawings; no less than the quantity of couplings and adaptors shown shall be allowed.

15. RESTRAINING POINTS

15.1 The main inlet and outlet piping to the station shall each be provided with two (2) or four (4) restraining points as welded on "eyes" or similar device welded to the capsule or framing to facilitate the attachment of joint restraint tie rods or other device to be used in retarding any pipe movement at the connections.

16. COMPRESSION COUPLINGS

- 16.1 The booster station piping shall include a compression type, flexible coupling to prevent binding and facilitate removal of associated equipment where shown on the plans for this item. In lieu of a compression coupling, a Uni-Flange or a flanged coupling adapter (FCA) may be used.
- 16.2 All compression couplings, Uni-Flanges, flanged coupling adapters (FCA), and flexible connectors/expansion joints shall include a minimum of two (2) control joint rods with gusset plates.

17. COMBINATION PRESSURE GAUGES

- 17.1 Combination pressure gauges shall be glycerine filled with a built-in pressure snubber and have 4-1/2 inch minimum diameter faces and be turret style, black phenolic case with clear glass face. The movement shall be rotary, of 400 Series stainless steel with teflon coated pinion gear and segment. Gauge shall be bottom connected and accept a 1/4" NPT female thread. Combination pressure gauge range and scale graduations shall be in psi and feet of water as follows:

INLET PRESSURE - 0 to 160 psi, 20 psi figure intervals, with graduating marks every 2 psi (0-370 feet).

OUTLET PRESSURE - 0 to 200 psi, 20 psi figure intervals, with graduating marks every 2 psi (0-460 feet).

- 17.2 All gauges will be panel mounted off the pipeline and be flexible connected to their respective sensing point. The gauge trim tubing shall be complete with both isolating and vent valves and the tubing shall be so arranged as to easily vent air and facilitate gauge removal. Gauges mounted directly to the pipeline or at the sensing point will not be accepted.

MANUFACTURER - Ashcroft Model 1279ASL.

18. SAMPLE TAP

- 18.1 A single, right angle outlet, smooth nose, brass sample tap shall be affixed to the manual vent ball valve for the low suction lockout and suction pressure gauge assembly.

19. BUTTERFLY VALVES

- 19.1 Valve body shall be wafer style and meet ANSI Class 125/150 flange standards. The metal reinforced dovetail seat shall ensure drop tight, bi-directional shutoff and shall be field replaceable. The stem shall be one piece. The disc and stem shall be connected by a stainless steel torque plug which shall provide positive engagement. The valve shall have upper and lower RTFE inboard stem bearings, isolated from line media, and a heavy-duty upper stem bushing.
- 19.2 The valve body shall be cast iron; aluminum bronze disc; stainless steel stem; EPDM seat; acetal upper stem bushing; BUNA-N V-cup stem seal.
- 19.3 Valves sized six (6) inches and smaller shall be equipped with lever operator and 10 degree increment throttling plate. Valves sized eight (8) inches and larger shall be equipped with a weather-proof, heavy-duty, gear operator complete with a position indicator.

20. NON-SLAM CHECK VALVES

- 20.1 Each pump discharge pipe run shall include a wafer-type, non-slam check valve. The body of the check valve shall be cast iron. The plug and seat shall be bronze and conform to ASTM Designation B-584. The guide bushings shall be bronze copper alloy and conform to ASTM Designation B-584. The valve spring and seat retainers shall be stainless steel and conform to ASTM Designation A-313. The valve plug shall be guided at both ends by a center shaft integral with the valve plug. Alignment of the center shaft shall be provided by guide bushings.

21. GATE VALVE

- 21.1 The meter inlet isolating valve where shown and as sized on the plan sheet covering this item shall be a gate valve meeting or exceeding AWWA Standard C-500. The gate valve will be cast iron body, bronze mounted, resilient seat, NRS (non-rising stem). The valve will be flanged pattern with flange and drilling complying to ANSI B16.1, Class 125. The valve will be complete with handwheel operator and shall be constructed so as to open left (counter-clockwise). Maximum working pressure shall be 200 psi.

22. WATER METER & STRAINER

- 22.1 The booster pump station shall include a turbine type meter, sized as shown on the plans for this item. The turbine meter shall be flanged and shall conform to ANSI Class 125. The meter shall be provided with a bronze case and measuring chamber which

shall include a polypropylene rotor with graphite radial bearings and a ceramic ring magnet embedded in the rear face of the rotor. The trim shall be stainless steel. A hermetically sealed direct reading register shall totalize in gallons with a 1,000 gallon sweep hand per revolution. The meter shall have a continuous flow range of 20 to 2500 gpm with a maximum intermittent flow of 3100 gpm. Maximum operating pressure 150 psi. The turbine meter assembly shall be complete with a like size, plate type, top clean-out strainer immediately upstream and flanged to the inlet of the turbine meter as shown on the plans for this item.

- 22.2 This station was designed to accept a Neptune HP Turbine water meter sized as shown on the plans. As such, "no substitutions" will be allowed in order to meet the upstream and downstream pipe diameters required to maintain the guaranteed meter accuracy of the specified meter.

23. METER TEST STATION

- 23.1 The meter installation shall be complete with a meter test station of a size as shown on the plans for this item. The test station shall be installed a minimum of three (3) pipe diameters downstream of the meter. The test station shall include an all bronze gate valve, minimum 2½" size, 200 psi WOG rating, with outlet side bronze adapter to change NPT to fire hose thread. The fire hose thread adapter shall be complete with a bronze hydrant cap and chain.

24. PRESSURE TESTING

- 24.1 When the station plumbing is completed, the pressure piping within the station, including valves, pumps, control valves, fittings, connections as make up the entire system shall be hydrostatically tested at a pressure of 100 psi or a pressure equal to the lowest test pressure rating of the equipment within the tested system, whichever is greater pressure. The test pressure shall be applied for a minimum of 20 minutes, during which time all joints, connections and seams shall be checked for leaking. Any deficiencies found shall be repaired and system shall be retested.

The results of this testing shall be transmitted in writing to the Engineer prior to shipment of the station and shall note test pressure, time at full pressure and be signed by the Quality Control Manager or test technician.

25. ELECTRICAL APPARATUS - DESIGN, ASSEMBLY & TEST

- 25.1 The electrical apparatus and control panel design, assembly, and installation, and the integration of component parts will be the responsibility of the manufacturer of record for this booster pumping equipment. That manufacturer shall maintain at his regular

place of business a complete electrical design, assembly and test facility to assure continuity of electrical design with equipment application. Control panels designed, assembled or tested at other than the regular production facilities or by other than the regular production employees of the manufacturer of record for this booster pumping equipment will not be approved.

26. CONFORMANCE TO BASIC ELECTRICAL STANDARDS

- 26.1 The manufacturer of electrical control panels and their mounting and installation shall be done in strict accordance with the requirements of UL Standard 508 and the National Electrical Code (NEC) latest revision so as to afford a measure of security as to the ability of the eventual owner to safely operate the equipment. **No exceptions to the requirements of these codes and standards will be allowed; failure to meet these requirements will be cause to remove the equipment and correct the violation.**

27. U.L. LISTING

- 27.1 All service entrance, power distribution, control and starting equipment panels shall be constructed and installed in strict accordance with Underwriter's Laboratories (UL) Standard 508 "Industrial Control Equipment." The UL label shall also include an SE "Service Entrance" rating stating the main distribution panel is suitable for use as service entrance equipment. The panels shall be shop inspected by UL, or constructed in a UL recognized facility. All panels shall bear a serialized UL label indicating acceptance under Standard 508 and under Enclosed Industrial Control Panel or Service Equipment Panel. In addition, a photocopy of UL labels for this specific project shall be transmitted to both project engineer and contractor for installation within their permanent project files prior to shipment of equipment covered under these specifications.

28. EQUIPMENT GROUNDING

- 28.1 Each electrical equipment item in the station shall be properly grounded per Section 250 of the National Electrical Code. Items to be grounded include, but are not limited to, pump motor frames, control panel, transformer, convenience receptacles, dedicated receptacle for sump pump/dehumidifier, heater, lights, light switch, exhaust fans and pressure switches.
- 28.2 All ground wires from installed equipment shall be in conduit and shall lead back to the control panel to a copper ground buss specific for grounding purposes and so labeled. The ground buss shall be complete with a lug large enough to accept the installing electrician's bare copper earth ground wire. The bus shall serve as a bond between the

earth ground and the equipment ground wires.

29. ELECTRICAL APPARATUS - CONTROL PANEL

29.1 All circuit breakers, motor starters, time delay relays and control relays shall be incorporated into one (1) NEMA I control panel. The electrical service provided for this station will be 230 volt, 3 phase, 60 cycle, 3 wire.

29.2 There shall be provided, thermal-magnetic trip circuit breakers as follows:

One (1) Main Breaker, 175 amps;
Two (2) Branch Breakers, one each per pump, 80 amps;
One (1) Transformer Breaker, Primary Side, 30 amps;
One (1) Transformer Breaker, Secondary Side, 60 amps;
One (1) Phase Monitor Breaker, 15 amps;
Eight (8) Auxiliary Circuit Breakers, as follows:

- | | |
|----------------|---------------------------|
| 1. Controls | 5. Sump Pump/Dehumidifier |
| 2. Lights | 6. Spare |
| 3. Heater | 7. Convenience Outlets |
| 4. Exhaust Fan | 8. Telemetry |

29.3 Pump starting equipment shall be three (3) phase, full voltage magnetic starters connecting the pump motor directly across the line, complete with overload relay with correctly sized heater elements on each line.

29.4 Automatic pump alternation shall be provided through a solid state sequence relay. The relay shall be enclosed in a plastic cover and shall plug into a eight (8) terminal socket. Control wiring for the sequence relay shall terminate at the socket. Replacement of the alternator shall not disturb control wiring. Automatic start of the backup pump upon lead pump failure shall be provided.

29.5 A solid state, phase sequence/failure and under voltage release relay shall be supplied. The relay shall be complete with an LED to indicate proper phase sequence, all phases in operation and voltage within limits. The relay shall also include an adjustable voltage monitor, be UL and CSA certified and complete with an automatic reset feature.

29.6 Balanced 240/120 single phase power for the auxiliary circuits within the scope of the booster station shall be obtained by use of a 10 KVA dry, step down transformer. The transformer shall be wall mounting type, dust tight and operate with low noise level. Transformer insulation shall be Class H (115C rise - 180C insulation). The unit shall be "UL" approved for indoor application.

30. ELECTRICAL APPARATUS - SUCTION PRESSURE CONTROL

30.1 Suction control of the pumping operation shall be provided by a bellows type, adjustable differential pressure switch. The switch shall be complete with a single pole, double throw contact block with 5 amp non-inductive rated contacts at 240 volts AC. The set points of the on/off cycle shall be independently adjustable through the full range of the switch rating.

1. Low Suction Cut-out, 4-150 psi.
 - 1A. Adjustable Differential, 2-25 psi.

30.2 A pressure gauge shall be sub-panel mounted adjacent to the low suction pressure switch. The gauge and switch shall be so plumbed with the suction header sensing line that a common blow-off valve can relieve pressure in both simultaneously for purposes of checking and calibrating the low suction lock-out.

31. ELECTRICAL APPARATUS - LOCAL PRESSURE CONTROL

31.1 Control of the pumps shall be provided by bellows type, adjustable differential pressure switches. Each switch assembly will be complete with a single pole, double throw contact block with 5 amp non-inductive rated contacts at 240 volts AC. The set points of the on/off cycle shall be independently adjustable through the full range of the switch rating.

1. Start Lead Pump, 4-150 psi control range.
 - 1A. Adjustable Differential, 2-25 psi.
2. Start Back-up Pump, 4-150 psi control range.
 - 2A. Adjustable Differential, 2-25 psi.

31.2 A pressure gauge shall be sub-panel mounted adjacent to the discharge pressure switches. The gauge and switches shall be so plumbed with discharge header sensing line that a common blow-off valve can relieve pressure in all simultaneously for purposes of checking and calibrating the start-stop functions of the pumps.

32. ELECTRICAL APPARATUS - TELEMETRY CONTROL - DESIGN, ASSEMBLY & TEST

32.1 The telemetry panel design, assembly, installation, startup, and integration of component parts will be the responsibility of the manufacturer of record for this booster pumping equipment. That manufacturer shall maintain at his regular place of business a complete telemetry design, assembly and test facility to assure continuity of control design with equipment application. Telemetry panels designed, assembled or tested at other than the regular production facilities or by other than regular production employees of

manufacturer of record for this booster pumping equipment will not be approved.

33. PANEL MOUNTING HARDWARE

33.1 Metal framing channel shall be used exclusively for mounting of all electrical panels and electrical components except for those specifically designated otherwise.

34. ELECTRICAL APPARATUS - RADIO TELEMETRY CONTROL - INTERFACE PANEL

34.1 It will be the responsibility of the booster station manufacturer to provide the following as an adjunct to the supplied telemetry equipment.

1. 1" telemetry entrance conduit complete to telemetry interface panel.
2. Size 12" x 12" NEMA 1 telemetry interface panel.
3. Separate 120 volt single phase power circuit in conduit to the telemetry interface panel.
4. Telemetry control circuits made up and in conduit from main control panel to telemetry interface panel terminal strip.
5. Brackets to mount telemetry equipment.

35. ELECTRICAL APPARATUS - DEVICES

35.1 Five (5) solid state time delay relays shall be provided to perform the following functions:

1. Low Suction Timer
2. Start Control Timer Pump #1
3. Stop Control Timer Pump #1
4. Start Control Timer Pump #2
5. Stop Control Timer Pump #2

35.2 The solid state time delay relay shall have an adjustable time range of 10 seconds to 10 minutes. The relays shall be constructed to use a DIN rail mount socket so that the relays can be replaced without disturbing the wiring. The relay shall be complete with LED indicators for output and power.

35.3 Hand-Off-Automatic switches shall be oil tight, 3-position maintained and be located on the main control panel door.

1. Pump #1
2. Pump #2
3. Exhaust Fan (2-position) Run-Auto

4. Telemetry Test

35.4 Indicating lights shall be oil tight, with a full voltage pilot light and be provided:

1. Red - Low Suction Pressure
2. Green - Pump #1 in Operation
3. Green - Pump #2 in Operation

35.5 Nameplates shall be furnished on all panel front mounted switches and lights.

35.6 The control panel door shall be complete on the interior with a stick-on transparency containing an "as-built" reproduction of the electrical control panel schematic. The wiring diagram shall be a corrected "as-built" copy and contain individual wire numbers, circuit breaker numbers, switch designations and control function explanations.

36. CONDUIT, WIRING, RECEPTACLES AND LIGHTING

36.1 The service entrance conduits shall be rigid steel conduit, individually sized to accept the inbound service conductors and telemetry/telephone/radio cables, and shall be installed from the main power or control panel through the equipment capsule side sheet and terminate exterior to the equipment capsule. The service entrance exterior conduit connection points shall be capped or plugged for shipment.

36.2 All wiring within the equipment capsule and outside of the control panel or panels shall be run in conduit except for the watertight flexible conduit and fittings used to connect pump drivers, fan motors, solenoid valves, limit switches, etc., where flexible connections are best utilized, in accordance with the National Electrical Code. Only the sump pump and dehumidifier, where furnished by the original manufacturer with a UL approved rubber cord and plug, may be plugged into a receptacle.

36.3 EQUIPMENT CAPSULE CONDUIT - Rigid, heavy wall, Schedule 40 PVC with solvent weld moisture-proof connections adequately sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 347 of the National Electrical Code and NEMA TC-2, Federal WC-1094A and UL-651 Underwriters Laboratory Specifications.

36.4 FLEXIBLE CONNECTIONS - Where flexible conduit connections are necessary, the conduit used shall be liquid-tight, flexible, totally nonmetallic, corrosion resistant, nonconductive, U.L. listed conduit sized to handle the type, number and size of equipment conductors to be carried - in compliance with Article 351 of the National Electrical Code.

- 36.5 **MOTOR CIRCUIT CONDUCTORS** - Sized for load. All branch circuit conductors supplying a single motor of one (1) horsepower or more shall have an ampacity of not less than 125 percent of the motor full load current rating, dual rated type THHN/THWN, as set forth in Article 310 and 430-B of the National Electrical Code (NEC), Schedule 310-13 for flame retardant, heat resistant thermoplastic, copper conductors in a nylon or equivalent outer covering.
- 36.6 **CONTROL AND ACCESSORY WIRING** - Sized for load, type MTW/AWM (Machine tool wire/appliance wiring material) as set forth in Article 310 and 670 of the National Electrical Code, Schedule 310-13 and NFPA Standard 79 for flame retardant, moisture, heat and oil resistant thermoplastic, copper conductors in compliance with NMTBA and as listed by Underwriters' Laboratories (AWM), except where accessories are furnished with a manufacturer supplied UL approved rubber cord and plug.
- 36.7 **RECEPTACLES** - Two (2) duplex, ground fault circuit interrupter type receptacles shall be furnished about the periphery of the equipment capsule, with one (1) receptacle adjacent to the main control panel. One (1) additional receptacle, three-wire grounded type, shall be installed and dedicated solely to sump pump/dehumidifier service only.
- 36.8 **LIGHTING** - There shall be one or more two-tube, 40 watt per tube, rapid start, enclosed and gasketed, forty-eight (48) inch minimum length fluorescent light fixtures installed within the equipment capsule, as shown on the plan for this item. One (1) light fixture shall be located directly over the main control panel. The light switch shall be of the night glow type and be located within the hatch periphery. The light switch shall be wired to operate the exhaust fan equipment whenever the equipment capsule lights are on. Open fluorescent or incandescent fixtures will not be accepted.

37. HEATER

1. One (1) each wall mounted as shown.
2. Rating - 10,239 BTU/HR - 3000 watts, 240 volt.
3. Enclosed resistance wire within steel finned element.
4. Control - thermostat.
5. UL listed.
6. Vane axial fan - floor flow discharge.
7. Hard wired in conduit per UL 400-1.

38. EXHAUST FAN

1. One (1) each installed as shown.

2. Capacity each 232 cfm at .2 inch static pressure.
3. Shaded pole motor - squirrel cage blower.
4. Hard wired in conduit to conduit box on motor per UL 400-1.
5. 120 volt A.C. operation from wall mount thermostat and HOA switch on main control panel.
6. Hatch installed limit switch to activate exhaust fan whenever the entrance hatch is open.
7. Exhaust air piping - 3 inch minimum.
8. Air return piping - 3 inch minimum.
9. Exhaust and return piping protected by 180° PVC return bend with removable insect screen.
10. When exhaust fans and an air conditioner or fan coil cooling unit are both used, the exhaust fans' control wiring shall contain relay contacts (normally closed) that open the exhaust fans' circuit whenever an air conditioner or fan coil cooling unit is in operation.

The automatic exhaust fan system specified herein should exempt this station from the limitations of permit-required confined space as detailed in the Code of Federal Regulations 1910.146(C)(5)(i)(B).

39. SUMP PUMP

1. One (1) each installed as shown.
2. Capacity 18 gpm at 15 feet TDH.
3. Impeller - glass filled valor.
4. Cast iron motor shell, switch cap and pump housing.
5. UL listed submersible oil filled motor - UL listed rubber power cord - 120 volt AC operation.
6. Float operated, submersible (NEMA 6) mechanical switch.
7. Completely submersible, hermetically sealed.
8. Auto reset thermal overload protection.
9. PVC pump discharge piping 1½" x 1¼" with single check valve - union both sides.
10. Provision for dewatering drain system for freeze protection.

40. DEHUMIDIFIER

1. One (1) each installed as shown.
2. Capacity 25 pints per 24 hours (AHAM Standard DH-1).
3. Refrigerant type, with environmentally safe refrigerant.
4. Compressor rated 1/5 HP, 4.1 amps, 400 watts.
5. Condensate piped direct to sump.
6. 120 volt AC operation by dial-controlled adjustable humidistat.
7. UL listed rubber cord.

41. FACTORY START-UP SERVICE

1. Start-up service technician shall be a regular employee of booster station manufacturer.
2. As part of the submittal covering this equipment, list the factory service manager, his employee number, his telephone number with extension and his number of years with the company. List also each start-up service technician, his employee number and years of service with the company.
3. Verify that one (1) or more of the service technicians listed above will perform the required start-up service on the equipment covered in the submittal.
4. One (1) full day at job site for start-up and training.
5. Start-up service to include two (2) bound O&M manuals.
6. Start-up service report attested to by start-up technician and representative of owner or engineer.
7. Service report distributed to:
 - A. Manufacturer's File
 - B. Engineer's File
 - C. Contractor's File
 - D. Owner's File

42. WARRANTY

- 42.1 The warranty is the responsibility of the station manufacturer and that warranty shall be provided in written form to the contractor for inclusion with the submittal and said warranty shall at a minimum cover:
1. A period of one (1) year commencing upon station acceptance by the Owner and Engineer.
 2. The one (1) year period shall be inviolate regardless of any component manufacturer's warranty for equipment and components within the station.
 3. The warranty shall cover all equipment, components and systems provided in or with the station.
 4. The warranty shall provide for replacement and/or repair of faulty or defective components at no cost to the owner during the warranty period.
 5. Where deemed necessary, the manufacturer will be responsible for the labor of removal and reinstalling the defective or faulty components without cost to the owner.

6. No assumption of contingent liabilities for any component failure during warranty is made.

43. GENERAL LIABILITY INSURANCE

- 43.1 The booster pump station manufacturer shall furnish premises/ operations and products/completed operations general liability insurance from an insurance company with a rating of A-V according to the most recent Best's Key Rating Guide, in an amount equal to \$10,000,000 per occurrence. The insurance certificate must be included with the manufacturer's submittal. The coverage must be provided by an insurance carrier licensed and admitted in the state of manufacture.

TECHNICAL SPECIFICATIONS

SECTION I

RADIO TELEMETRY SYSTEM

1. GENERAL

- 1.1 The Contractor shall furnish, install and place into operation a radio telemetry control system designed to automatically monitor water level in the new elevated water storage tank and operate two new booster pumps as described herein. The booster pumps will operate in a specified sequence, in response to variations in the water level in the new tank. The Contractor shall also furnish, install and place into operation a flow control valve which will be controlled from existing equipment in the existing booster pump station. Additional relays and re-wiring will be required to provide a complete and operable installation. The Contractor shall submit a detailed plan for rewiring and a specific plan of operation prior to purchasing equipment.
- 1.2 The system described hereafter is a Bulletin A300/D620/E1000 Telemetry Control System as manufactured by US Filter Control of St. Paul, MN. The naming of a manufacturer of equipment in this specification is not intended to eliminate competition or prohibit qualified manufacturers from offering equipment. Rather, the intent is to establish a standard of excellence for the material used, and to indicate a principle of operation desired. The contractors bid shall be based on the use of US Filter Control Systems equipment or an equivalent alternate.
- 1.3 It is important for all bidding contractors to note that if alternate proposals based on substituted systems are to be bid, they must be prequalified by the consulting engineer in advance of the bid date as hereinafter specified. In the event a prequalified system is installed by the Contractor and does not meet the specified intent of this specification with regard to reliability, efficiency, functional capability, or other system parameters, the alternate system may be rejected by the Consultant and must be replaced with the US Filter Control Systems system originally specified. This option may be exercised by the Owner or the Consultant at any time during the project tenure. Project tenure is defined as beginning the date the project bids and ending on the date the system has operated satisfactorily for one year after final acceptance.

2. FIELD SUPERVISION

- 2.1 The services of a factory trained, qualified representative shall be provided to inspect the

operation and instruct the operating personnel in the proper care and operation of the equipment.

3. GUARANTEE

- 3.1 All equipment shall be guaranteed against defects in material and workmanship for a period of one year from date of Owner's final inspection and acceptance to the effect that any defective equipment shall be repaired or replaced without cost or obligation to the Owner.

4. U.L. APPROVAL

- 4.1 The control panels shall be constructed in compliance with Underwriter's Laboratories Industrial Control Panels listing and following-up service, utilizing U.L. listed and recognized components where applicable. The control panels shall bear the Underwriter's Laboratory listed serialized label.

5. SCOPE

- 5.1 The following equipment shall be furnished:

Item A - Elevated Tank Level (Pressure) Transducer/Transmitter

Item B - Booster Station Receiver/Controller

Item C - Wiring, relays, etc. to control valve

- 5.2 The equipment shall control the operation of two booster pumps in a pump-up mode to maintain proper level in the elevated tank and will coordinate with the existing Consolidated Electric microprocessor based radio control systems. The existing system shall be modified to allow for the control of a new valve installed near the existing booster station to allow the existing storage tank to be filled from the new storage tank and distribution system or through the use of the existing booster pump.

- 5.3 A micro-processor based programmable control shall be furnished at the new booster station to control the pump operation and communicate with the new remote elevated tank site. The controller, monitoring the analog tank level signals, shall display the elevated storage tank level, low and high tank level alarms, pump running and failure conditions and signal and power failure for the new storage tank site. The communication between the booster station and the tank site shall be over FM radio.

5.4 EQUIPMENT REQUIREMENTS

A. LIGHTING ARRESTOR

A lighting arrestor shall be supplied in the control panels at each location and connected to each line of the incoming side of the power input terminals. The arrestor shall protect the control against damage as the result of transient voltage surges caused by lighting interference, switching loads and power line interference.

B. WIRING

All wiring shall be minimum 600 volt UL type MTW or AWM and have a current-carrying capacity of not less than 125% of the full load current. The conductors shall be in complete conformity with the national electric codes, state, local and NEMA electrical standards. For ease of servicing and maintenance, all wiring shall be color coded as follows:

- Black for AC line power
- White for neutral
- Red for switched AC
- Gray for DC common
- Violet for DC positive
- Green for ground

C. POWER SUPPLY

The equipment at each site shall be designed for operation on 120 volt single phase service.

D. ENCLOSURE

The elevated tank level transducer and telemetry transceiver (RTU) shall be furnished in wall mounted NEMA 3R enclosure constructed of not less than 14 gauge steel rigidly formed and welded and finished with gray polyester powder coating inside and out over a phosphatized surface. The enclosure shall be furnished with an internal condensation heater and thermostat. Also included shall be a control power circuit breaker and lighting arrestor on the main incoming power.

The described equipment at the booster station for sequence control and telemetry shall be housed in a properly sized NEMA 4 enclosure constructed of not less than 14 gauge steel rigidly formed and welded and finished with gray polyester powder coating inside and out over a phosphatized surface. The enclosure shall be furnished with an inner door and a hinged clear cover to allow the controller to be viewed without opening the enclosure door. The enclosure shall contain a control power circuit breaker and lighting arrestor on the main incoming power.

6. EQUIPMENT CONSTRUCTION

ELEVATED TANK PRESSURE TRANSDUCER

- 6.1 The liquid level (pressure) of the elevated tank shall be sensed by a US Filter Control Systems Bulletin A300, Model 221GCD Transducer. The transducer shall be a 4-20 ma DC, 2-wire, 15 to 40 VDC loop-powered type with its output signal directly proportional to the measured level excursion over a factory-calibrated range of zero to 40 (feet of water) (PSIG).
- 6.2 The transducer shall incorporate a variable-capacitance transducer element to convert the sensed pressure to a corresponding electrical value. The sensed media shall exert its pressure against an oil filled nitrile diaphragm seal having a nickel plated carbon steel 1/4" NPT connection port (with clean-out plug) connected to the transducer's ceramic diaphragm which flexes minutely so as to vary its proximity of a ceramic substrate to vary the capacitance of an electrical field created between the two surfaces.
- 6.3 A stable, hybrid, operational amplifier assembly shall be incorporated in the transducer to excite and demodulate the sensing mechanism. The transducer shall incorporate laser trimmed, temperature compensated, high quality components and construction to provide a precise, reliable, stable output signal directly proportional to the sensed pressure over a factory-calibrated range.
- 6.4 The transducer shall include easily accessible offset and span adjustments. Fine and coarse adjustments for both span and offset shall be provided, using 25-turn potentiometers. Span shall be adjustable from 100% down to 15% of the sponsor range. Offset adjustments shall be up to 75% of range and shall be non-interactive with span.
- 6.5 The transducer shall be plumbed within the enclosure to manifold with a 3 1/2" pressure gauge, shutoff and bleed needle valves having 1/4" female external bulkhead pressure connections in the bottom of the enclosure.

7. SEQUENCE PROGRAMMABLE CONTROLLER & MASTER TELEMETRY UNIT (MTU)

- 7.1 A comprehensive automatic pump and alarm control system shall be furnished, installed and placed into successful operation under this specification. It shall be a standard, catalogued product of a water and wastewater pumping automation equipment manufacturer regularly engaged in the design and manufacture of such equipment. The level sensing system and the control logic/alternation elements shall all be of one manufacture. The pump/alarm controller shall be specifically designed for water and wastewater pumping automation utilizing standard hardware and software. "One of a kind" systems using custom software with a generic

programmable controller will not be acceptable.

- 7.2 The level transducer signals shall be converted to a "feet of water and tenths" digital display and keyboard-configurable digital setpoints shall be provided for differential-level type pump operation as well as automatic alternation and/or manual sequence selector timing, variable speed pump ramp control logic and alarm performance as herein described.
- 7.3 The Controller shall accept up to three (3) analog signals (1-5 VDC or 4-20 mADC) representing the sensed pressure, level and flow signals. It's operating program shall be resident in ROM and include full-scale ranging and pump-up/down determination. The controller shall be arranged to operate up to eight (8) pumps plus high and low level alarms. Load relays with 10 amp @ 250 VAC-rated contacts shall be provided for the pumps/alarms described and have their load circuits brought to screw clamp/barrier type terminal blocks for convenient job connection. The ON and OFF adjustments of each pump shall be full-range adjustable through use of an authorized operator access code and a keypad. Review of controller adjustments shall be possible by the operator without use of the access code.
- 7.4 Input signal conditioning shall provide keypad-selectable averaging of the input signal with one reading taken every second and from one to thirty reading being selectable with the Controller displaying and providing control based on a moving average of the selected number of samples.
- 7.5 The Controller shall provide a keypad-configurable First-On/First-Off (FOFO) Automatic Alternator providing alternation for two (2) to eight (8) pumps using the operator access code. The First-On/First-Off Automatic Alternator shall operate the pumps in a manner so that when any pump turns off the alternator logic is advanced. The operating sequence shall assure that when there is an increase in the demand for pumpage, the pump having had the longest rest since its previous operation will be brought into service. Conversely, upon a lessening of demand, the pump that has been running the longest will be shut down first. The alternator shall be capable of accepting an advance input and shall automatically transfer to the next pump sequence (standby pump) when an advance input is sensed. A time clock shall be provided in the control to step the alternator.
- 7.6 The alternator shall be capable of accepting pump run and failure inputs received from the remote sites and shall display pump status conditions.
- 7.7 The digital controller shall include keypad adjustable on-delay timing logic to provide staggered pump starting following a power failure condition. The controller shall also provide keypad adjustable off delay timing for each pump control stage to provide smooth transition between control stages.
- 7.8 In addition to the pump control capability, the controller shall have its low alarm as "Output

O" and its high alarm as "output 17". The controller digital display shall show the operation of each control stage as well as abnormal alarm, signal failure and system monitor/alarm outputs of a watchdog timer. Upon the occurrence of an abnormal level condition or an input signal failure, an audible device shall operate together with an alarm load relay. A keypad silence button shall be provided to allow silencing of the audible device while the digital display will continue to show the alarm function until the condition has cleared.

- 7.9 The display shall be a 32-character backlit alphanumeric type showing the level in feet and tenths, pressure in pounds and tenths, flow in GPM or MGD. The display shall incorporate LCD elements suited for minus 32 to plus 60 degree Centigrade with reflective characteristics. The operations code shall confirm the selection of a particular output or other function from the keypad during adjustment or review routines. When operating a key of the controller the audible alarm shall chirp briefly to confirm that the selected key has operated. The display shall, in addition to providing tank level indication, shall display pump running and failure conditions, high & low tank level alarms, high service pump low level cutout, remote tank site power failure alarms and signal failure conditions. The controller shall also display a transducer failures (out of range) condition.
- 7.10 The digital controller display/keypad shall be housed in a flush-mounted, environmentally protected assembly and mounted on the door of the control panel. The unit shall employ an operator interface having a 32-character alphanumeric LCD display with character height not less than 3" and with a 16 position keypad operating in menu mode. The described interface shall combine with a panel mounted single board computer having all-necessary discrete and analog inputs/outputs as required to provide effective automatic operation of the pumping station.
- 7.11 It is the specific intention of this functional requirement that a standard controller will be employed with features as herein described and that it be a fully-integrated assembly. That is, the furnishing of similar functions using a multiplicity of thumbwheel switches, extensive relay logic to accomplish alternation sequences, etc., is specifically precluded by this specification and will not be acceptable.
- 7.12 A watchdog function shall be provided in the controller which observes meaningful microprocessor activity. In the unlikely event of microprocessor stoppage the watchdog shall reset the processor. In addition it shall transfer Form C contacts provided to job connection terminals.
- 7.13 The digital controller shall be furnished with a multiple-ramp output capability implemented in hardware and software for the variable speed pumps. One ramp shall be programmed to be re-configurable with the operation of each of the sixteen (16) control stages and the other independent ramp configurable with respect to the full-range conditioned signal of the controller without reference to control stage operations.

7.14 Each ramp output signal shall be selectable to be 1-5 VDC into 25K ohms or greater impedance or a 4-20 mADC into not less 600 ohms.

7.15 Each ramp shall have the following five parameters configurable from the controller keyboard:

1. Whether it is a positive or negative-going ramp.
2. The (pressure) at which the maximum ramp signal is to be produced.
3. The (pressure) at which the maximum ramp signal is to be produced.
4. The percentage of full-scale ramp signal output desired at the selected high (pressure).
5. The percentage of full-scale ramp signal output desired at the selected lower (pressure).

7.16 Each control stage shall be capable of re-defining the ramp that is common to all (for purposes of load-sharing under differing conditions). The other ramp shall be independent of the first and configurable as described without referenced to the operation of the control stages.

7.17 In addition to keypad configurability of each ramp, they shall also be reviewable by the operator by use of convenient keypad sequence.

8. ELEVATED TANK REMOTE TERMINAL UNIT (RTU)

8.1 The RTU shall be provided with a Single Board Communications Computer (SBCC). The SBCC shall be offered in a number of different configurations to meet the particular applications needs of each location in this project. The SBCC shall be capable of accepting the following inputs and outputs:

- 12 - ON/OFF Status Inputs (including one High-speed Interrupt)
- 10 - ON/OFF 1/4 amp Control/Alarm Outputs (including one Watchdog/Alarm)
- 5 - Analog Inputs (12-bit binary/4,096 count)
- 3 - 1-5 VDC or 4-20 mADC at terminals
- 1 - Committed DC battery voltage/AC line condition monitor
- 2 - Analog Outputs (12-bit binary/4096 count)

8.2 Each of the ON/OFF Inputs and Outputs shall have an on-board LED indicator. Inputs shall be activated by external circuit connection to Common of the I/O section power supply (isolated from the processor section of the assembly). The ten output circuits shall each have an individual open-collector driver conservatively rated at 1/4 amp at up to 30 VDC. The open-collector driver shall energize load relays with contacts rated 10 amps at 120 VAC. The contacts shall be brought to barriered, clamp-type terminal blocks for connection to the motor starter pilot circuits.

- 8.3 A watchdog ON/OFF output shall be controlled by the on-board watchdog which continuously monitors uP activity. In the event of a cessation of activity the watchdog shall reset the uP and de-activate the output driver; thus indicating the occurrence of an abnormal condition. This output shall be available to operate an independent alarm system or a redundant control arrangement in a "failsafe control" application. An on-board switch shall allow manual resetting of the processor.
- 8.4 All job connections shall be made at barriered, wire clamp type, UL-recognized terminal blocks each accepting one or two AWG 14-22 wires. Discrete (ON/OFF) inputs and outputs shall have an independent on-board power supply and be optically-isolated (1,500 volts) and designed to meet the IEEE 472-Surge Withstand Capability Standard requirements.
- 8.5 The SBCC shall combine a high performance microprocessor with a powerful event-driven, multi-tasking operating system well suited to communication/process control data manipulation. CMOS construction shall provide a low power requirement and reliable performance under high electrical noise/temperature conditions.
- 8.6 The SBCC shall have an 8-bit address switch and an 8-bit configuration switch with a crystal controlled real-time clock. The address switch shall give each SBCC a unique binary/digital address, thus rendering a single spare SBCC suitable for use as a spare for any remote location simply by setting the address switch to the appropriate binary address.
- 8.7 The configuration switch shall enable on-board troubleshooting and diagnostic routines, input/output display routines (for the 4-character LED alphanumeric display) and communications options. The SBCC shall have a socket and 4 character LED alphanumeric display which can display static or scrolling messages as they are enabled by a particular software program and called up via the configuration switch set. Uses shall include display of pressures, levels, flow rates, temperature, logged values, communication failures and a broad range of diagnostic routines.
- 8.8 The SBCC shall operate with an off-board class 2 isolation transformer having a 120 VAC primary. It shall have an on-board DC power supply.
- 8.9 Each SBCC shall be inherently capable of communicating over any voice-grade media, including direct metallic lines, coaxial networks, leased telephone lines, dial-up telephone lines or VHF/UHF radio channels. This application shall utilize a FM radio link. When a "Pump On" setpoint is reached, the will automatically dial signal the local high service pumps and the remote well pump to operate as required.
- 8.10 The SBCC shall be provided with a standard RJ-11 phone jack connector and operate with standard pulse dialing systems. The SBCC shall be FCC part 68 approved for use over conventional dial-up telephone lines. The SBCC shall clearly indicate it's FCC registration

number and ringer equivalence.

- 8.11 It is the specific intention of this functional requirement that a standard communications computer will be employed with features as herein described and that it be a fully-integrated assembly. The Communications Computer shall be a Model SBC2 as manufactured by US Filter Control System of St. Paul, MN.

9. COMMUNICATIONS MODEM

- 9.1 A modem shall be provided with the previously specified SBCC for communications. The modem shall be a 1200 baud device. All data and control signals between the modem and CTU shall be pin compatible at RS-232 levels.
- 9.2 The modem shall have on-board LEDs for indication of transit data, receive data, transmit enable (radio key) and carrier detect. A Transmit Level potentiometer shall provide adjustment of the signal from 9 to 0 dBm into 600 ohms.

10. RADIO TRANSCEIVERS

- 10.1 Transceivers shall be 100% solid state units operating in the FM VHF 148-174 Mhz or UHF 450-470 Mhz range. All radio connections shall be via plug-in connectors. This requirement applies to the coaxial cable feed line radio power and data connections. The FM transceivers shall meet the following as a minimum:

a. Transmitter:

1. Selectable 1,2 or 5 watt power output as required per each location and as allowed by the system FCC license.
2. Spurious and harmonic emissions: 60dB
3. Frequency stability: +/-0.0005% over a temperature range of -30 to +60 degrees C.
4. Transmit rise time: 50mS
5. Audio distortion: less than 6%.
6. FM hum and noise: -50 dB.
7. Audio frequency response: +1/-3 dB per octave pre-emphasis from 300-3000 Hz.
8. Modulation: 16F3+/-5KHz.

b. Receiver:

1. Sensitivity: 12 dB SINAD: 0.35 microvolts; 20 Db Quieting: 0.50 microvolt.
2. Selectivity: -65dB at +/-25 Khz

3. Spurious and image rejection: -60dB
4. Intermodulation rejection: -60dB.
5. Audio power output: 500 milliwatts
6. Frequency stability: +/-0005% over a temperature range of -30 to +60 degrees C.

The transceivers shall comply with FCC parts: CP -15, 21, 74, 90, 95; CS -15, 22, 74 90, 95.

11. ANTENNA SYSTEMS

- 11.1 Furnish and install an antenna for each transceiver. Mount antennas on wood poles, self-supporting steel towers or masts as shown on the plan drawings or as required for reliable signal transmission. All antennas and supporting structures shall be designed to withstand a 100 Mph wind with a 1/4" coating of ice.
- 11.2 Remote antennas shall be a 3-element Yagi array with a gain of at least 7 db.
- 11.3 The central antenna (MTU) shall be an omnidirectional type with a minimum gain of 3 dB.

Each radio telemetry unit shall be provided with a bulkhead-type antenna/cable lightning arrester, one hundred feet of RG-8/U coaxial cable and all required connectors.

12. LICENSING

- 12.1 The system supplier shall be responsible for obtaining the FCC station and operating licenses for the owner. This shall include performing a path study based on data provided to the system supplier by the owner/engineer. This information shall include:
 1. Area topographic maps.
 2. Site names/locations and addresses.
 3. Site ground and building/pole elevations.
 4. Latitude and Longitude for each site.
 5. Approximate path length.

The system supplier shall be responsible for the following:

1. Obtain FCC approval the system operation.
2. Prepare all materials required by the FCC.
3. Obtain all license application forms, write in all required information and forward to the owner for signature(s).
4. Provide all information required by the area frequency coordinator.

13. **HAND-OFF AUTOMATIC SELECTOR SWITCH**

- 13.1 A door mounted hand-off-automatic selector switch shall be furnished for field installation in the door of the controller at the existing booster station. The switch shall allow the existing booster pump to be controlled to fill the existing tank. When the switch is positioned to allow automatic booster pump operation, automatic control of the new valve will be disabled and the valve shall remain in the closed position.

14. **CONDENSATION PROTECTIVE HEATER**

- 14.1 A 100 watt, 120 VAC condensation protective heater and high temperature cutout thermostat shall be supplied in the control panel at site.

15. **BATTERY**

- 15.1 A 12 VDC gelled-electrolyte battery with automatic charger shall be an integral part of the system at the elevated storage tank site. Automatic transfer to battery power shall occur in the event of loss of commercial power. All charging and logic circuitry shall be solid-state with low current drain to provide extended operation of the telemetry unit during a power failure condition.

16. **REQUIRED INFORMATION FOR CONSIDERATION OF ALTERNATE**

- A. This information shall include complete mechanical dimensions, electrical details, and specifications of every valve, meter and other instrument to be provided by this section.
- B. System sketches shall be provided of the hydraulic processes identifying the locations schematically of all process equipment being provided by this contract, and the schematic location of the devices being provided in relation to the process equipment.
- C. A written system description of how the control system interacts with the process equipment is to be provided.
- D. A system sketch shall be provided indicating the relationship of telemetry equipment to the system.
- E. A sketch shall be provided of the main control panel indicating enclosure size and relative location of panel mounted equipment.
- F. All panel mounted equipment is to be identified on this panel sketch so that their existence can be checked and functional relationships determined.
- G. Failure to receive the above information at time of bid will be considered non-responsive and will be cause to reject the alternate. Information submitted with the proposed alternate bid will be used to determine qualifications and quality only of the alternate system supplier, and acceptance of the alternate is not to be interpreted as a revision to the requirement of this specification.

TS-I-12

TECHNICAL SPECIFICATIONS

SECTION J

ELEVATED STORAGE TANK

1 GENERAL SCOPE

1.1 DESCRIPTION OF WORK

The work to be performed under this section consists of the furnishing of all materials, tools, equipment, labor and incidentals necessary for the design, manufacture, delivery, erection, painting and testing of an all welded steel elevated storage tank. The tank is to be complete with all accessories specified herein, and is to be erected on foundations to be designed and constructed by the Tank Contractor. The tank shall have a capacity of 1,000,000 gallons stored above the low water line as shown on the project plans.

The contracting company shall be a specialist in the design and construction of elevated steel tanks and shall have built in its own name not less than ten (10) comparable tanks within the last five years now giving satisfactory service. Each bidder shall provide a letter with his bid listing such examples giving the owner, tank size, date constructed, consulting engineer, and engineer's address and telephone number. Such company shall have on its staff a full time professional engineer with not less than five years experience in design and field construction of elevated steel tanks who will be the responsible engineer in charge of the work to be done.

The contracting company shall own their fabrication facilities. Divided responsibilities between erection and fabrication will not be allowed.

1.2 SUBMITTALS

a. Each bidder shall submit with his proposal a design sketch of the structure he proposes to furnish. This general plan of the structure must show all major dimensions including the tank diameter, the height to lower and upper capacity levels, the sizes of all principal and secondary members, thickness of all plates and arrangements of members.

b. The Tank Contractor must submit detailed shop drawings on the foundation and tank to the engineer for review and approval. Calculations shall be submitted with shop drawings for both foundation and tank. All shop drawings shall be sealed by a Professional Engineer registered in the state of Kentucky and employed by the Contractor.

c. Foundation shop drawings and tank drawings must be approved by the Engineer before any foundation work effort begins or before any fabrication begins.

d. The Contractor shall submit certified mill test reports from an independent testing laboratory for all steel plates and principal structure members.

2. TANK FOUNDATIONS

The Tank Contractor shall furnish and install all materials, labor and equipment necessary to complete the tank foundations complete with anchor bolts, reinforcing steel and concrete.

The foundations and footings shall be designed and built in accordance with the recommendations found in the soils report. The foundation construction drawings shall be submitted to the Engineer for review and final approval.

3. TANK DESIGN AND MATERIALS

3.1 GOVERNING SPECIFICATIONS

Material, design, welding, shop fabrication, erection, testing, and inspection of the proposed elevated water storage tank shall be in compliance with the latest revision of the American Water Works Association Standard Specification, AWWA D100, for "Welded Steel Elevated Tanks, Standpipes and Reservoirs for Water Storage" and the latest edition of American Welding Society.

The following design parameters shall apply, and the structures shall safely withstand the following loads acting separately or in combination:

1. Weight of the structure.
2. Weight of the water in the tank.
3. The structure shall be designed to withstand wind stresses blowing at a rate of 100 MPH from any direction.
4. Seismic Zone 1 per AWWA D-100.
5. Snow load minimum of 25 PSF as specified in AWWA.

All metal in the structure shall be manufactured, rolled or shaped in accordance with the current A-283 specifications of ASTM. The minimum thickness of any steel plate

in contact with water shall be one-quarter (1/4) inch.

3.2 ELEVATED STORAGE TANK

The tank shall be of the oblatoid type and shall be of the latest all welded design. Preference shall be given to designs of good appearance with operating characteristics which give as constant a pressure on the mains as is consistent with the manufacturer's standards and economics of design. The net capacity shall be 1,000,000 gallons. The height of the tank high water level from above the top of the foundations shall be 185 feet.

The steel tower supporting the tank shall consist of a circle of peripheral tubular steel columns with bracing members and a central riser.

3.3 ACCESSORIES

A steel riser pipe of 8 foot diameter from base of the tower to the tank bottom. A 14" x 18" manhole shall be located in the riser pipe 3' above the foundation.

A 12 inch diameter steel inlet/outlet connection pipe with base elbow. The pipe shall extend up into the riser pipe a minimum of 12" above the riser bottom.

A 12 inch diameter tower supported steel overflow pipe. The overflow pipe shall be formed to match the roof contour and extend to discharge onto a splash pad at grade level. A corrosive resistant insect screen will be located at the discharge point to prevent the ingress of birds and insects.

One 24" diameter weatherproof access hatch with hinged cover and catch located at top of tank to provide access to tank interior.

One 20" diameter tank vent located at the center of the tank roof to permit passage of air at a sufficient rate to prevent development of dangerous pressures or vacuum. The vent will be designed to prevent the ingress of birds, insects, or animals.

The tank shall be equipped with a balcony not less than 24 wide with a handrail not less than 42 high. The floor of the balcony shall be designed for a minimum vertical load of 1000 pounds assumed to be applied to any point. The floor shall be perforated for drainage. The OSHA approved handrail shall be capable of withstanding a 300 pound load applied laterally at the top rail.

Fixed ladders on the tower from a point 10' above grade level to balcony. Fixed

outside tank ladder to roof hatch. Interior ladder extending from the base of the riser to the roof access hatch.

All ladders shall be equipped with an OSHA approved cable-type safety climbing device with one belt and clamp assembly.

A tank identification plate shall be mounted on the tank riser pipe above the access manhole. The identification plate shall contain the following information.

1. Tank Contractor
2. Contractor's project or file number
3. Tank capacity
4. Height to overflow
5. Date erected

4. COATING SYSTEM

4.1 MATERIALS

- A. All materials specified herein are manufactured by the TNEMEC Co., Inc., North Kansas City, Missouri (Local Contact (606) 277-2943 and are approved for use on this project.
- B. Equivalent materials of other manufacturers may be substituted on approval of the ENGINEER. Requests for substitution shall include Manufacturer's literature for each product giving the name, generic type, descriptive information and evidence of satisfactory past performance on water tanks. Submittals shall include the following performance data as certified by a qualified testing laboratory:
 1. ASTM B117 - Method of Salt Spray (Fog) Testing
 2. ASTM D149 - Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials of Commercial Power Frequencies.
 3. ASTM D3359 - Method for Measuring Adhesion by Test Tape.
 4. ASTM D3363 - Method for Film Hardness by Pencil Test.
 5. ASTM D4060 - Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
 6. ASTM D4541 - Method for Pulling-off Strength of Coats Using Portable Adhesion Testers.
 7. ASTM D4585 - Practice for Testing the Water Resistance of Coatings Using Controlled Condensation.
 8. ASTM G53 - Practice for Operating Light and Water Exposure of Nonmetallic Materials.
 9. AWWA D102 - Standard for Painting Steel Water Storage Tanks.

10. SSPC-SP10 - Near White Blast Cleaning.
11. SSPC Sp-6 - Commercial Blast Cleaning.

4.2 SURFACE PREPARATION

After fabrication, all interior surfaces shall be shop cleaned in accordance with Steel Structures Painting Council Surface Preparation Specifications No. 10 "Near White" blast cleaning. All exterior surfaces shall be shop cleaned in accordance with SSPC Surface Preparation Specification No. 6 "Commercial Blast Cleaning". After cleaning all surfaces shall be thoroughly and completely cleaned of any residue or dust.

After the tank is erected, welded, and tested, the seams and adjacent areas shall be cleaned of all slag and splatter from the welding and all surfaces that were shop primed shall be cleaned of all dirt and foreign matter.

All welded seams, abraded spots and areas not shop primed shall be cleaned in accordance with SSPC No. 10 for interior surfaces and SSPC No. 6 for exterior surfaces.

4.3 APPLICATION

All materials shall be brought to the job site in the original sealed and labeled containers of the paint manufacturer indicating that the quantity of each coating purchased was sufficient to properly coat all surfaces. Such certification shall make reference to the square footage figures provided to the manufacturer and the Engineer by the Contractor. Colors shall be selected by the Owner.

The Contractor shall apply each coating at the rate and in the manner specified by the manufacturer. If material has thickened or must be diluted, the coating shall be built up to the same film thickness achieved with undiluted material. Deficiencies in film thickness shall be corrected by the application of additional coat(s) of paint. Where thinning is necessary, only products of the manufacturer furnishing the paint, and for the particular purpose, shall be allowed. All thinning shall be done strictly in accordance with the manufacturer's instructions, as well as with the full knowledge and approval of the Engineer.

No paint shall be applied when the surrounding air temperature, as measured in the shade, is below 40 degrees Fahrenheit. No paint shall be applied when the temperature of the surface to be painted is below 50 degrees Fahrenheit. Paint shall not be applied to wet or damp surfaces, and shall not be applied in the rain, fog or mist, or when the

relative humidity will exceed 70%. No paint shall be applied when it is expected that the relative humidity will exceed 70% or that the air temperature will drop below 40 degrees Fahrenheit within 18 hours after the application of the paint. Dew or moisture condensation shall be anticipated, and if such conditions are prevalent, painting shall be delayed until mid-morning to be certain that the surface is dry. Further, the days painting shall be completed well in advance of the probable time of day when condensation occurs, in order to permit the film an appreciable drying time prior to the formation of moisture.

4.4. INTERIOR COATING SYSTEM

a. Field Primer Coat

1. Immediately after blasting and before any rusting occurs (within 12 hours maximum) apply one (1) coat of TNEMEC Series 20-1255* Pota-Pox Beige Primer to unpainted areas. This coating to be applied to 4.0 - 6.0 mils dry film thickness.

b. Stripe Coat

1. Apply one complete coat of TNEMEC 20-1255* Pota-Pox Beige to all weld seams by brush or roller.

c. Final Field Coat

1. Apply one (1) coat of TNEMEC Series-WH02* (AA83) Pota-Box. Tank White to 4.0 - 6.0 mils dry film thickness.

*TNEMEC Series 44-700 Epoxy Accelerator may be added to the Series 20 Pota-Pox to increase contractor productivity and to enable coating operations to continue should the substrate temperature falls between 50°F and 35° F. No coating shall be applied if the substrate temperature falls below 35°F.

d. Field Finish Coat

Apply one (1) coat of TNEMEC Series 74-COLOR Endurashield in a color selected by the Engineer/Owner to a dry film thickness of 2.0 - 3.0 mils.

4.5. EXTERIOR COATING SYSTEM

a. Spot Field Primer

1. Apply TNEMEC Series 135 Chem Build to a dry film thickness of 2.0-3.0 mils.

b. Field Intermediate Coat

1. Apply TNEMEC Series 135 Chem Build to a dry film thickness of 2.0-3.0 mils.

c. Field Finish Coat

1. Apply one (1) coat of TNEMEC Series 74-COLOR Endurashield in a color selected by the engineer/owner to a dry film thickness 2.0-3.0 mils.

4.6 ACCEPTANCE OF WORK

All surface preparation shall be approved by the engineer/owner before primer is applied. Any coating applied without engineer/owner approval of surface preparation shall be completely removed.

Request acceptance of each coat before applying next coat.

Correct work that is not acceptable and request re-inspection.

4.7 LETTERING

After the exterior finish coat has dried, the letters "Jessamine County Water District #1" shall be painted on 1 side of the tank. The coating used for the lettering must be the same coating as specified for the exterior finish coat. Letter color and orientation shall be selected by the Owner.

The letters shall be block type, approximately 24" inches high with a brush stroke of approximately 6" wide. The lettering shall be spaced as shown on the project drawings. The Contractor shall submit a layout drawing to the Engineer for approval before proceeding with the work.

4.8 DISINFECTION

After the tank has been painted and the interior surfaces have thoroughly dried, the Contractor shall remove all visible dirt and contaminating materials. The interior of the tank shall be disinfected in accordance with Chlorination Method No. 2 of AWWA C652-92. A minimum of seven (7) days following the application of the final coat on the interior surfaces shall be allowed before the tank is sterilized or filled with water.

The Contractor shall be responsible for obtaining proper disinfection as determined by bacteriological testing. The Contractor shall collect and submit samples of water from the tank and have tested by the Public Health Authority having jurisdiction.

Water for filling the tank after the initial disinfection will be provided by the Owner. If the bacteriological test fails, the tank shall be re-disinfected. The Contractor shall reimburse the Owner for water required to fill the tank after the first filling.

5 TANK CONSTRUCTION

5.1 ERECTION OF TANK

All parts forming the structure shall be built in accordance with approved drawings. The workmanship and finishing shall be the best in modern shop practice. Welding must be done by operators who have been qualified within the previous year, in accordance with the requirements of the American Welding Society. Records of these qualification tests shall be available to the Engineer. The work at all times shall be open to the Engineer or his representative.

Upon completion of the tank erection, the Tank Contractor will remove or dispose of all rubbish and other unsightly material caused by its operation, and will leave the premises in good appearance.

5.2 TESTING

After tank construction has been completed, the tank shall be hydrostatically tested by filling with water which will be furnished by the Owner. Any leaks shall be repaired and the structure made watertight. No repair work will be done on any joints unless the water level in the tank is at least two feet below the joint being repaired

In addition the Tank Contractor shall test the weld joints by means of radiographic method. All testing shall be done in accordance with the latest revisions of AWWA D100, Section 11. The radiographic film test results will become the property of the Owner.

6 WARRANTY

6.1

The Contractor must guarantee for one year the structures he furnishes under these specifications to the extent that he will repair any defects due to faulty design, workmanship or material which may appear in the structures.

S2.DOC

TECHNICAL SPECIFICATIONS

SECTION K

SOLENOID CONTROLLED THROTTLING VALVE (FLOW CONTROL VALVE)

1.0 BASIC VALVE

- 1.1 The solenoid controlled throttling valve shall be a six inch hydraulically operated piston type valve.
- 1.2 The valve shall be ruggedly constructed with a six inch, 250 lb. flanged, full ported globe body design.
- 1.3 The solenoid controlled throttling valve shall be fully bronze mounted, external pilot operated, with a rugged internal free floating piston (operated without springs, diaphragm or levers), single seat with seat bore equal to size of valve.
- 1.4 The minimum travel of the piston shall be equal to 25% of the diameter of the seat.
- 1.5 For true alignment (to correct lateral thrust and stem binding) the piston shall be guided above and below the seat a distance no less than 75% of the seat diameter.
- 1.6 The piston shall carry a contoured cushion device that will cause a gradual change in flow area as the valve approaches the seat. The cushion device must move with the piston to minimize head loss when the valve is fully opened and so designed as to insure positive closure.
- 1.7 The valve shall be packed with leather to insure tight closure and prevent metal to metal friction and seating.
- 1.8 The valve shall include a position indicator to show position of opening of the piston.
- 1.9 The valve will include gauge cocks for testing purposes.
- 1.10 The valve shall be controlled by two 2 way solenoid pilot valves or dual solenoid pilot valve with a closed center position. Energizing one solenoid will cause the valve to open; energizing the other will cause the valve to close. With both solenoids de-energized the pilot will 'lock' the main valve piston.

- 1.11 The pilot valve, controlling operation of the main valve, shall be easily accessible and so arranged to allow for its removal from the main valve while the is under pressure.
- 1.12 The pilot valve and all associated piping and fittings necessary for proper operation shall be factory assembled and furnished with the solenoid controlled throttling valve.
- 1.13 Ball valves shall be installed in the control piping to completely isolate the pilot valve when conditions may require pilot isolation for maintenance or repair.
- 1.14 An external strainer with blow-off will be provided in the control circuit to protect the pilot and needle valves.
- 1.15 The design shall be such that repairs and dismantling internally of the main valve may be made without its removal from the line.

2.0 PHYSICAL AND CHEMICAL PROPERTIES

- 2.1 The 125 lb. and 250 lb. flanged assemblies shall conform to ANSI standards for flange thickness and drilling and wall thickness of body and caps.

The valve shall be ruggedly constructed of first class grey iron.

The grey iron shall be free from cold shuts, defective or spongy spots and conforming to ASTM specification. A-126 Class B with bronze or stainless steel trim.

The bronze parts shall conform to ASTM specification B-62.

The seat disc shall be bronze

The external pilot valve shall be bronze.

The rugged internal piston shall be bronze.

The seat ring shall be bronze.

The stem nuts shall be bronze.

The main cup plates shall be bronze.

The main bushing shall be bronze.

The seat packing support shall be bronze.

The position indicator shall be bronze.

The bottom cap cylinder shall be bronze.

Piping shall be rigid brass pipe.

The strainer shall be bronze body with stainless steel screen.

The ball valves shall be full ported with stainless steel shaft, nut and adjusting handle.

Stainless steel shall be Grade 316.

3.0 TEST

3.1 The test before shipment may be witnessed by a representative of the Engineers for simulated field conditions and a cold hydrostatic test of at least 100% above the maximum pressure for which the valve is to be operated.

4.0 PAINING

4.1 All iron castings shall be coated on all sides with at least two coats of a rust inhibiting synthetic resin and asphaltum enamel.

5.0 REFERENCE

5.1 The valve will be equal in all respects to the 42AFCVCI model as manufactured by the Ross Valve Mfg. Co., Inc., 6 Oakwood Ave., Troy, NY 12181

SUBSURFACE INVESTIGATION
PROPOSED 1 MG ELEVATED WATER TANK
U.S. 27 & GROGGINS FERRY ROAD
JESSAMINE COUNTY, KENTUCKY

For

HAWORTH, MEYER & BOLEYN, INC.
3 HMB CIRCLE
U.S. 460
FRANKFORT, KY 40601

Report No. 110189-0197-09
January 22, 1997





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MORNER**

COMMITTED TO EXCELLENCE
SINCE 1911

2416-B Over Drive
Lexington, KY 40510
606-233-0250
606-253-0183 FAX

January 22, 1997

Haworth, Meyer & Boleyn, Inc.
3 HMB Circle
U.S. 460
Frankfort, KY 40601

ATTN: Mr. Bob Blankenship

RE: Subsurface Investigation
Proposed 1 MG Elevated Water Tank
Jessamine County, Kentucky

Dear Bob,

We are pleased to submit our report of the soil study at the above referenced project in Jessamine County, Kentucky.

The purpose of the study was to determine the physical characteristics of the soil and rock strata beneath the site and to determine foundation design criteria for the proposed water tank. Also to be noted were conditions that would affect the design and/or construction of the proposed water tank.

For our convenience, the samples will be retained at our laboratory for a period of thirty (30) days unless we are advised otherwise. If you have any questions or if we can be of further service, please contact us.

Respectfully submitted,

BOWSER-MORNER ASSOCIATES, INC.

J. Alan Goble, E.I.T.
Project Engineer

Charles S. Bishop, P.E.
Senior Engineer

ANALYTICAL SCIENCES • GEO-ENVIRONMENTAL SERVICES • CONSTRUCTION SERVICES

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TS-L-2

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TEXT



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1.0 INTRODUCTION

Verbal authorization to proceed with the subsurface investigation was given on December 18, 1996 by Mr. Bob Blankenship of Haworth, Meyer & Boleyn, Inc. Work was to proceed in accordance with the proposal submitted by Bowser-Morner Associates, Inc. dated December 30, 1996. This report presents the findings of the subsurface investigation conducted at the tank site and includes foundation recommendations for the proposed elevated water tank.

2.0 PROJECT DESCRIPTION

The proposed elevated water tank is to be located in Jessamine County approximately 1.5 miles north of the community of Nicholasville. The tank site is located approximately 1500 feet northeast of the intersection of U.S. 27 and Groggins Ferry Road. A site location map showing the immediate vicinity of the tank is included in Section IV of this report.

We understand the proposed one (1) million gallon water storage tank will be an elevated structure supported on eight legs and a center riser. The tank will stand approximately 185 feet in height and will have a foundation diameter of approximately 70 feet.

The topography of the tank site may be described as gently sloping with a topographic relief of approximately three (3) feet across the site. At the time of our field work, the site cover consisted of sparse weed vegetation (2 - 3 feet high). Trees and brush were common along fence rows around the site.

3.0 GEOLOGIC SETTING

The site is located in the Inner Bluegrass Physiographic region of Central Kentucky. Soil at the site is residual in origin, having been formed by the weathering and breakdown of the limestone bedrock.

The Geologic Quadrangle map of the Nicholasville Quadrangle (Map GQ-767) indicates that the site is located near the contact of the Brannon Member and Grier Limestone Member. These rock units are part of the Lexington Limestone formation and are of middle and upper Ordovician age. Samples of the rock cores indicate the tank site is most likely underlain by the Grier Limestone Member. The Grier Member consists predominately of limestone and having



minor amounts of shale. Sink holes and caverns are common where the overlying Brannon unit is thin or eroded away.

4.0 DRILLING AND SAMPLING

Four (4) borings were performed at the site to investigate the subsurface conditions. All borings were sampled to refusal depth and a minimum of ten (10) feet of rock core was obtained. Borings B-2, B-3, and B-4 were located in the field by BOWSER-MORNER ASSOCIATES personnel. The borings were located in reference to the center of tank location (B-1) which was located by HMB, Inc. survey personnel. Approximate locations of the borings are shown on the Boring Location Plan in Section V of this report.

The borings were made with a truck-mounted drill rig using hollow stem augers and employing standard penetration resistance methods (140 pound hammer, 30-inch-drop, 2-inch O.D. split-spoon sampler) at maximum intervals of 5 feet or major changes in strata to refusal. The disturbed split-spoon samples were classified, logged, sealed in moisture-proof jars and brought to the laboratory for study. The location at which a split-spoon sample was obtained is indicated on the boring logs as an "A" type sample.

Two (2) relatively undisturbed samples were taken by hydraulically pressing, at a constant rate, three-inch-O.D. thin walled samplers through the soil strata. The thin-walled samplers were sealed and taken to the laboratory for tests and evaluation, as necessary. The depth at which a thin-walled sample was obtained is indicated on the boring logs as a "C" type sample.

A minimum of ten (10) feet of rock core was obtained from each of the borings. This core was taken to confirm the presence of solid bedrock at the site and to allow observations of the physical characteristics of the rock. The cores were made with NQ size, diamond coring equipment with a special core barrel for maximum core recovery. The depths where the cores were taken are indicated on the boring logs as a "B" type sample. Boring logs are provided in Section III of this report.



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5.0 SUBSURFACE CONDITIONS

The soil overburden encountered in borings B-1, B-2, B-3 and B-4 consists of 0 to 0.3 feet of topsoil underlain by a stiff to very stiff, brown Sandy Fat Clay (CH) which extends to bedrock. Standard penetration resistance ("N" values) values within the Sandy Fat Clay (CH) ranged from 7 to 25 with an average value of 18. Bedrock refusal was encountered between 7.7 to 12.6 feet below the surface. It should be noted that the drilling equipment used can often auger up to 2 feet into weathered bedrock (through the transition zone) before encountering refusal. Rock cores obtained in borings B-1, B-2, B-3, and B-4 consisted of light-grey, very hard limestone. Rock Quality Designation values (RQD) ranged from 58 to 100 percent and Recovery Ratios from 98 to 100 percent, both are noted on the boring logs.

It should be noted that borings B-1 and B-4 encountered a void within the bedrock formation. Table 1 below presents a summary of this finding.

TABLE 1

| <u>Boring</u> | <u>Surface Elevation (ft)</u> | <u>Refusal Elevation (ft)</u> | <u>Top of Void Elevation (ft)</u> | <u>Bottom of Void Elevation (ft)</u> | <u>Void Thickness (ft)</u> |
|---------------|-------------------------------|-------------------------------|-----------------------------------|--------------------------------------|----------------------------|
| B-1 | 1030.34 | 1021.84 | 1020.34 | 1019.04 | 1.3 |
| B-4 | 1030.55 | 1022.85 | 1019.75 | 1018.55 | 1.2 |

The voids which were encountered were located 1.5 and 3.1 feet below auger refusal. The height of the voids are 1.3 and 1.2 feet, respectively. These voids are the result of bedding plane solutioning near the rock surface. No other voids or rock discontinuities were encountered in the other borings or below the voids in borings B-1 and B-4.

Groundwater was not encountered in any of the borings. A review of Soil Conservation Service soil study of Jessamine County indicates groundwater is greater than six (6) feet below the surface. It should be noted that groundwater will fluctuate with seasonal and climatic variations.

6.0 LABORATORY WORK

One Atterberg Limit test was performed to determine the liquid and plastic limit of the soil overburden in accordance with ASTM D-4318. Ten moisture content determinations were made in accordance with ASTM D-2216 and one wash sieve (No. 200) was performed in accordance with ASTM D-1140. Additionally, an unconfined compression test was performed on an intact rock core specimen in accordance with ASTM D-2938. Table 2 below summarizes the results of the laboratory tests.

TABLE 2

| Boring No. | Depth (ft) | Moisture Content(%) | Atterberg Limits | | | Unconfined Compression Strength (psi) | USCS Classification | % Passing No. 200 Sieve |
|---------------|------------|------------------------|------------------|----|------|---|------------------------|-------------------------------|
| | | | LL | PL | PI | | | |
| B-1 | 3.5-5.0 | 23.9 | | | | | | |
| B-1 | 6.5-8.0 | 29.1 | | | | | | |
| B-2 | 6.5-8.0 | 37.2 | | | | | | |
| B-2 | 9.0-10.5 | 32.1 | | | | | | |
| B-3 | 1.0-2.5 | 23.7 | | | | | | |
| B-3 | 3.5-5.0 | 25.1 | | | | | | |
| B-3 | 9.0-10.5 | 32.3 | | | | | | |
| B-3 | 19.7-20.1 | | | | 4900 | | | |
| B-4 | 3.5-5.0 | 30.3 | 55 | 25 | 30 | Sandy Fat Clay (CH) | 54 | |
| B-4 | 6.5-7.4 | 31.3 | | | | | | |

7.0 CONCLUSIONS AND RECOMMENDATIONS

The tank site is suitable for construction of the proposed water tank. Based on the data obtained, the following recommendations are made for the tank foundation:



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1. Due to encountering a void in borings B-1 and B-4 at a shallow depth below top of rock, the use of a shallow foundation system is considered too high of a risk and is not recommended. We recommend that the tank be supported on a **drilled pier** foundation system designed for end bearing on limestone bedrock. The bearing elevation must extend below the known voids (EL. 1018.5 ft) which are discussed in Section 4 of the report. Since the voids were encountered in only two of the four borings, and the borings may or may not be located directly beneath a proposed column location, it will be necessary to verify that no voids are present beneath each of the piers as further addressed in part 2 below.
2. The recommended allowable bearing pressure on the limestone bedrock is 80 ksf. It is recommended that a probe hole (min. 1-1/2 diameter) be drilled immediately below the proposed bearing elevation to confirm a minimum of 10 feet of sound, continuous limestone.
3. Based on the recommended bearing pressure. It is anticipated that total settlement will be less than one (1) inch and differential settlement less than one-half (1/2) inch.
4. It is recommended that the foundation excavation and bearing elevation be observed by a geotechnical engineer or his representative prior to placement of concrete to determine if conditions differ from those anticipated.
5. When considering resistance to foundation uplift for the water tank, the following options are recommended.
 - The base of the piers may be mechanically anchored into sound, continuous limestone with high strength tension steel rock anchors.



- The soils can be partially undercut at the column locations. An appropriate sized concrete mass made integral with the pier system can then be poured to increase gravitational resistance.
 - The use of available skin resistance between the concrete piers and sound, continuous limestone may be used. A unit skin friction resistance of 2.5 ksf is recommended for the concrete/limestone contact. A minimum socket of 3 ft into limestone bedrock is recommended. It will be necessary to verify the socket length during construction by experienced personnel.
6. The absence or presence of underground limestone mining directly beneath the tank from the Catnip Hill Quarry operation was investigated. Based on a meeting with Mr. Sam Van of The Allen Company (1/3/97) and a review of their mapping, the approximate lateral extent of underground mining was determined. The underground mine is approximately 3500 to 4000 feet from the tank site. Refer to the site location map in Appendix IV. From this meeting, we understood that approximately 400 feet separated the ground surface from the mine ceiling and that the mine had a ceiling to floor height of 105 feet. Based on those approximate dimensions, the mining operation should not influence the tank site should a partial or full collapse of the mine occur. The impact of underground blasting on the tank is beyond the scope of this investigation.

8.0 CLOSURE

8.1 Basis of Recommendations

The evaluations, conclusions, and recommendations in this report are based on our interpretation of the field and laboratory data obtained during the exploration, our understanding of the project and our experience with similar sites and subsurface conditions.



Data used during this exploration included, but were not necessarily limited to:

- four (4) exploratory borings made for this study,
- observations of the project site by our staff,
- results of the laboratory tests,
- limited information and interaction with Haworth, Meyer & Boleyn, Inc.
- published soil or geologic data of this area.

In the event that changes in the project characteristics are planned, or if additional information or differences from the conditions anticipated in this report become apparent, Bowser-Morner should be notified so that the conclusions and recommendations contained in this report can be reviewed, and if necessary, modified or verified in writing.

8.2 Limitations of Study/Recommended Additional Services

The subsurface conditions discussed in this report and those shown on the boring logs represent an estimate of the subsurface conditions based on interpretation of the boring data using normally accepted geotechnical engineering judgment. Although individual test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Regardless of the thoroughness of a subsurface exploration, there is the possibility that conditions between borings will differ from those at the boring locations, that conditions are not as anticipated by designers, or that the construction process has altered the soil conditions. As variations in the soil profile are encountered, additional subsurface sampling and testing may be necessary to provide data required to reevaluate the recommendations of this report. Consequently, after submission of this report, it is recommended that Bowser-Morner be authorized to perform additional services to work with the designer(s) to minimize errors and omissions regarding the interpretation and implementation of this report.



It must be emphasized that the excavation and compaction of soil fill are highly influenced by weather conditions. Performing the earthwork under wet conditions is generally very difficult. Compaction of wet silty and clayey soils most often cannot be compacted to the required density without modification or stabilization. Frozen soils should not be used at all for structural fill. Consequently, after submission of this report, it is recommended that Bowser-Morner be authorized to perform additional services to work with the designer(s) to minimize errors and omissions regarding the interpretation and implementation of this report.

Prior to construction, we recommend that Bowser-Morner:

- work with the designers to implement the recommended geotechnical design parameters into plans and specifications,
- consult with the design team regarding interpretation of this report,
- establish criteria for the construction observation and testing for the soil/rock conditions encountered at this site; and
- review final plans and specifications pertaining to geotechnical aspects of design.

During construction, we recommend that Bowser-Morner:

- observe the construction, in particular
- caisson inspections, concrete placement and testing,
- perform in-place density testing of all compacted fill (if any)
- perform materials testing of soil and other materials as required; and
- consult with the design team to make design changes in the event that differing subsurface conditions are encountered.

If Bowser-Morner is not retained for these services, we shall assume no responsibility for construction compliance with the design concepts, specifications or recommendations.



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8.3 Warranty

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. No other warranty, express or implied, is made.

The scope of this study did not include an environmental assessment for the presence or absence of hazardous or toxic materials in the soil, surface water, groundwater or air, on, within or beyond the site studied.

This report has been prepared for the exclusive use of the Haworth, Meyer & Boleyn, Inc. for the specific design and construction of the proposed one (1) million gallon elevated water storage tank in Jessamine County, Kentucky. Specific design and construction recommendations have been provided in the various sections of the report. The report shall, therefore, be used in its entirety. This report is not a bidding document and shall not be used for that purpose. Anyone reviewing this report must interpret and draw their own conclusions regarding specific construction techniques and methods to be chosen. Bowser-Morner is not responsible for the independent conclusions, opinions or recommendations made by others based on the field exploration and laboratory test data presented in this report.



II. FIELD/LAB PROCEDURES



BORING LOG TERMINOLOGY

Stratum Depth:

Distance in feet and/or inches below ground surface.

Stratum Elevation:

Elevation in feet below ground surface elevation.

Description of Materials:

Major types of soil material existing at boring location. Soil classification based on one of the following systems: Unified Soil Classification System, Ohio State Highway Classification System, Highway Research Board Classification System, Federal Aviation Authority Classification System, Visual Classification.

Sample No.:

Sample numbers are designated consecutively, increasing with depth for each boring.

Sample Type:

"A" Split spoon, 2" O.D., 1-3/8" I.D., 18" in length.

"B" One of the following:

Power Auger Sample

Piston Sample

Diamond Bit NX: BX: AX:

Housel Sample

Wash Sample

Denison Sample

"C" Shelby Tube 3" O.D. except where noted.

Sample Depth:

Depth below top of ground at which appropriate sample was taken.

Blows per 6" on Sampler:

The number of blows required to drive a 2" O.D., 1-3/8" I.D., split spoon sampler, using a 140 pound hammer with a 30 inch free fall, is recorded for 6" drive increments. (Example: 3/8/9)

"N" Blows/Ft.:

Standard penetration resistance. This value is based on the total number of blows required for the last 12" of penetration. (Example: 3/8/9 ∴ N = 8 + 9 = 17)

Water Observations:

Depth of water recorded in test boring is measured from top of ground to top of water level. Initial depth indicates water level during boring, completion depth indicates water level immediately after boring, and depth after "X" number hours indicates water level after letting water rise or fall over a time period. Water observations in pervious soil are considered reliable ground water levels for that date. Water observations in impervious soils can not be considered accurate ground water measurements for that date unless records are made over several days' time. Factors such as weather, soil porosity, etc., will cause the ground water level to fluctuate for both pervious and impervious soils.

SOIL DESCRIPTION

Color:

When the color of the soil is uniform throughout, the color recorded will be such as brown, grey, black and may be modified by adjectives such as light and dark. If the soil's predominant color is shaded by a secondary color, the secondary color precedes the primary color, such as: grey-brown, yellow-brown. If two major and distinct colors are swirled throughout the soil, the colors will be modified by the term mottled, such as: mottled brown and grey.

| Particle Size | Visual | Soil Components | |
|---------------|---|------------------|----------------------|
| | | Major Component: | Minor Component Term |
| Boulders | Larger than 8" | | |
| Cobbles | 8" to 3" | Gravel | Trace 1-10% |
| Gravel—Coarse | 3" to 3/4" | Sand | Some 11-35% |
| Fine | 2 mm. to 3/4" | Silt | And 36-50% |
| Sand —Coarse | 2 mm.-0.6 mm. (Pencil lead size) | Clay | |
| —Medium | 0.6 mm.-0.2 mm. (Table sugar and salt size) | | |
| —Fine | 0.2 mm.-0.06 mm. (Powdered sugar and human hair size) | | |
| Silt | 0.06 mm.-0.002 mm. | | |
| Clay | 0.002 and smaller (Particle size of both Silt and Clay not visible to naked eye) | | |

| | | Moisture Content | |
|--|--|------------------|---|
| | | Term | Relative Moisture |
| | | Dry | Powdery |
| | | Damp | Moisture content below plastic limit |
| | | Moist | Moisture content above plastic limit but below liquid limit |
| | | Wet | Moisture content above liquid limit |

**Condition of Soil Relative to Compactness
Granular Material**

| | |
|--------------|----------------------|
| Very Loose | 5 blows/ft. or less |
| Loose | 6 to 10 blows/ft. |
| Medium Dense | 11 to 30 blows/ft. |
| Dense | 30 to 50 blows/ft. |
| Very Dense | 51 blows/ft. or more |

**Condition of Soil Relative to Consistency
Cohesive Material**

| | |
|--------------|----------------------|
| Very Soft | 3 blows/ft. or less |
| Soft | 4 to 5 blows/ft. |
| Medium Stiff | 6 to 10 blows/ft. |
| Stiff | 11 to 15 blows/ft. |
| Very Stiff | 16 to 30 blows/ft. |
| Hard | 31 blows/ft. or more |

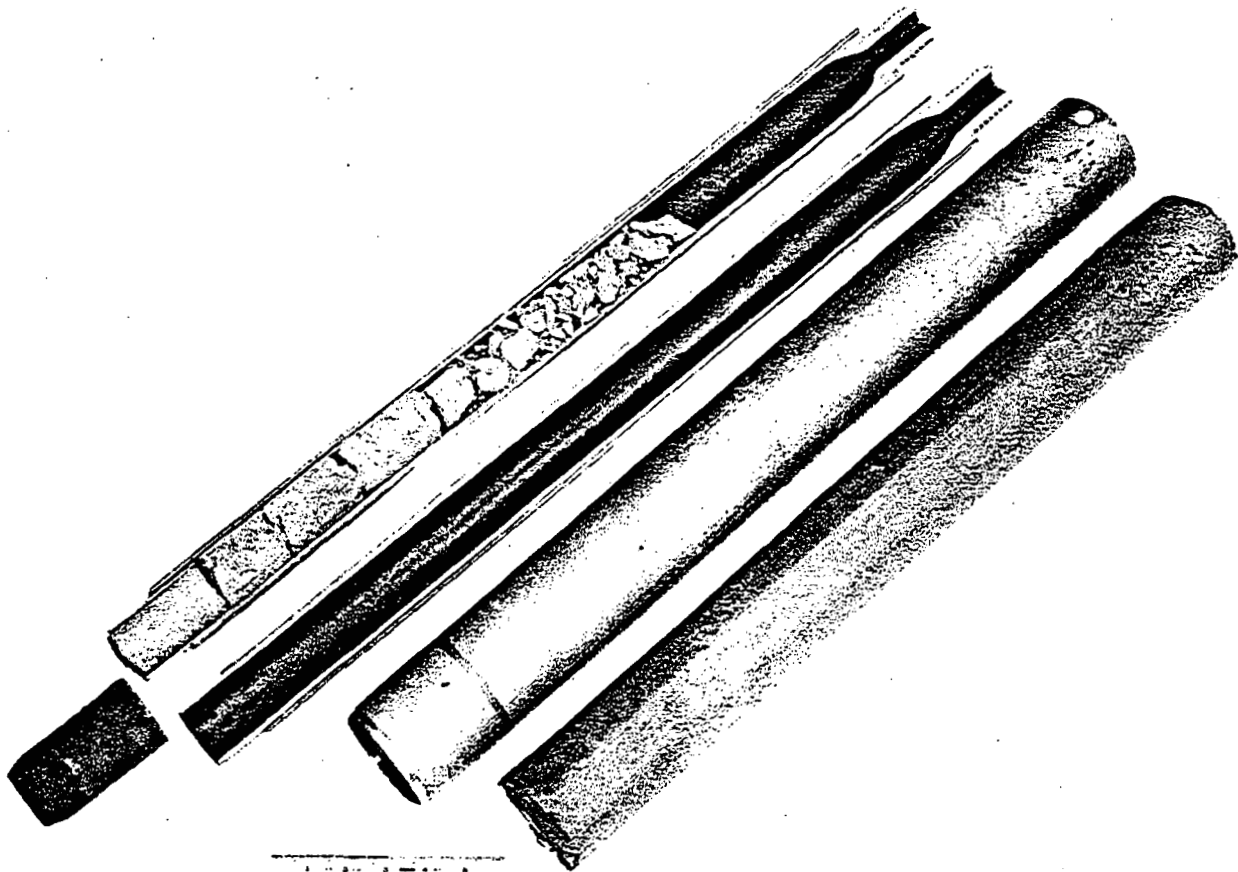
STANDARD PENETRATION RESISTANCE (ASTM D1586)

The purpose of this test is to determine the relative consistency of the soils in a boring, or from boring to boring over the site. This method consists of making a hole in the ground and driving a 2 inch O.D. split spoon sampler into the soil with a 140 pound hammer dropped from a height of 30 inches. The sampler is driven 18 inches and the number of blows recorded for each 6 inches of penetration. Values of standard penetration (N) are determined in blows per foot, summarizing the blows required for the last two 6 inch increments of penetration.

Example: 2-6-8; N = 14

THIN-WALLED SAMPLER (ASTM D1587)

The purpose of the thin-walled sampler is to recover a relatively undisturbed soil sample for laboratory tests. The sampler is a thin-walled seamless tube with a 3 inch outside diameter, which is hydraulically pressed into the ground, at a constant rate. The ends are then sealed to prevent soil moisture loss, and the tube is returned to the laboratory for tests.



REVISED TO ASTM D4318
ATTERBERG LIMITS (ASTM D423 and D424)

These tests determine the liquid and plastic limits of soils having a predominant percentage of fine particle (silt and clay) sizes. The liquid limit of a soil is the moisture content expressed as a per cent at which the soil changes from a liquid to a plastic state, and the plastic limit is the moisture content at which the soil changes from a plastic to a semi-solid state. Their difference is defined as the plasticity index ($P.I. = L.L. - P.L.$), which is the change in moisture content required to change the soil from a "semi-solid" to a liquid. These tests furnish information about the soil properties which is important in determining their relative swelling potential and their classifications.

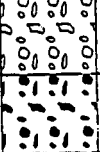





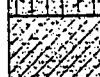




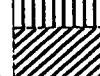

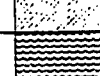
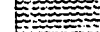
MECHANICAL ANALYSIS (ASTM D422)

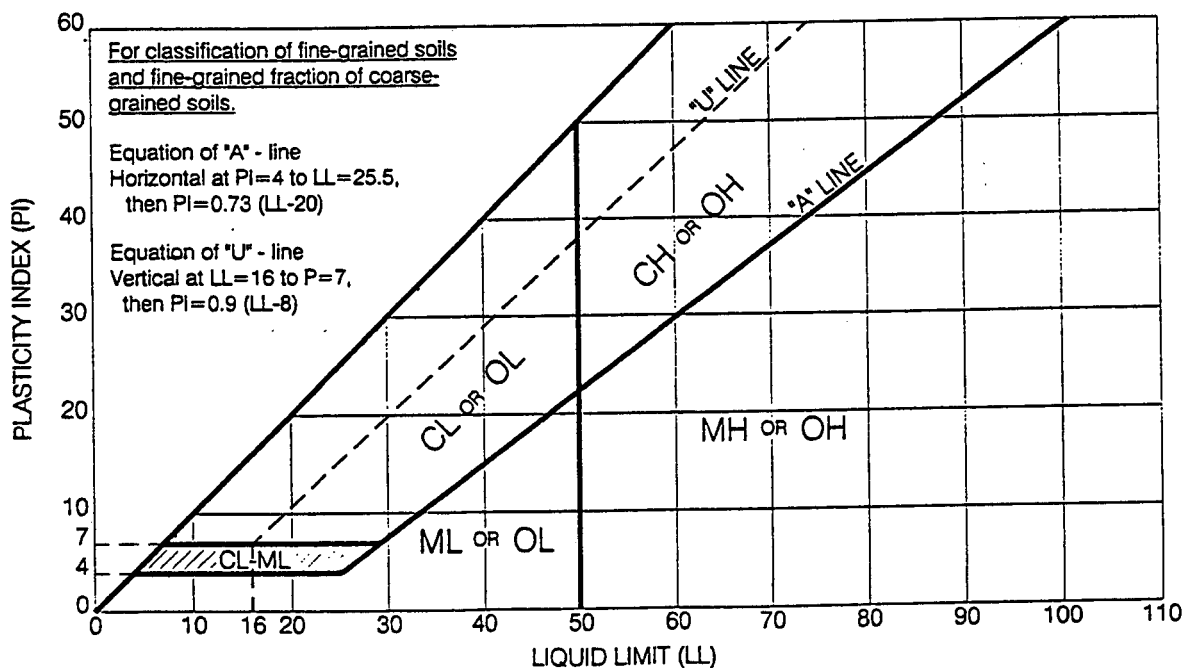
This test determines the per cent of each particle size of a soil. A sieve analysis is conducted on particle sizes greater than a No. 200 sieve (0.074 mm), and a hydrometer test on particles smaller than the No. 200 sieve. The gradation curve is drawn through the points of cumulative per cent of particle size, and plotted on semi-logarithmic paper for the combined sieve and hydrometer analysis. This test, together with the Atterberg Limits tests, is used to classify a soil.

NATURAL MOISTURE CONTENT (ASTM D2216)

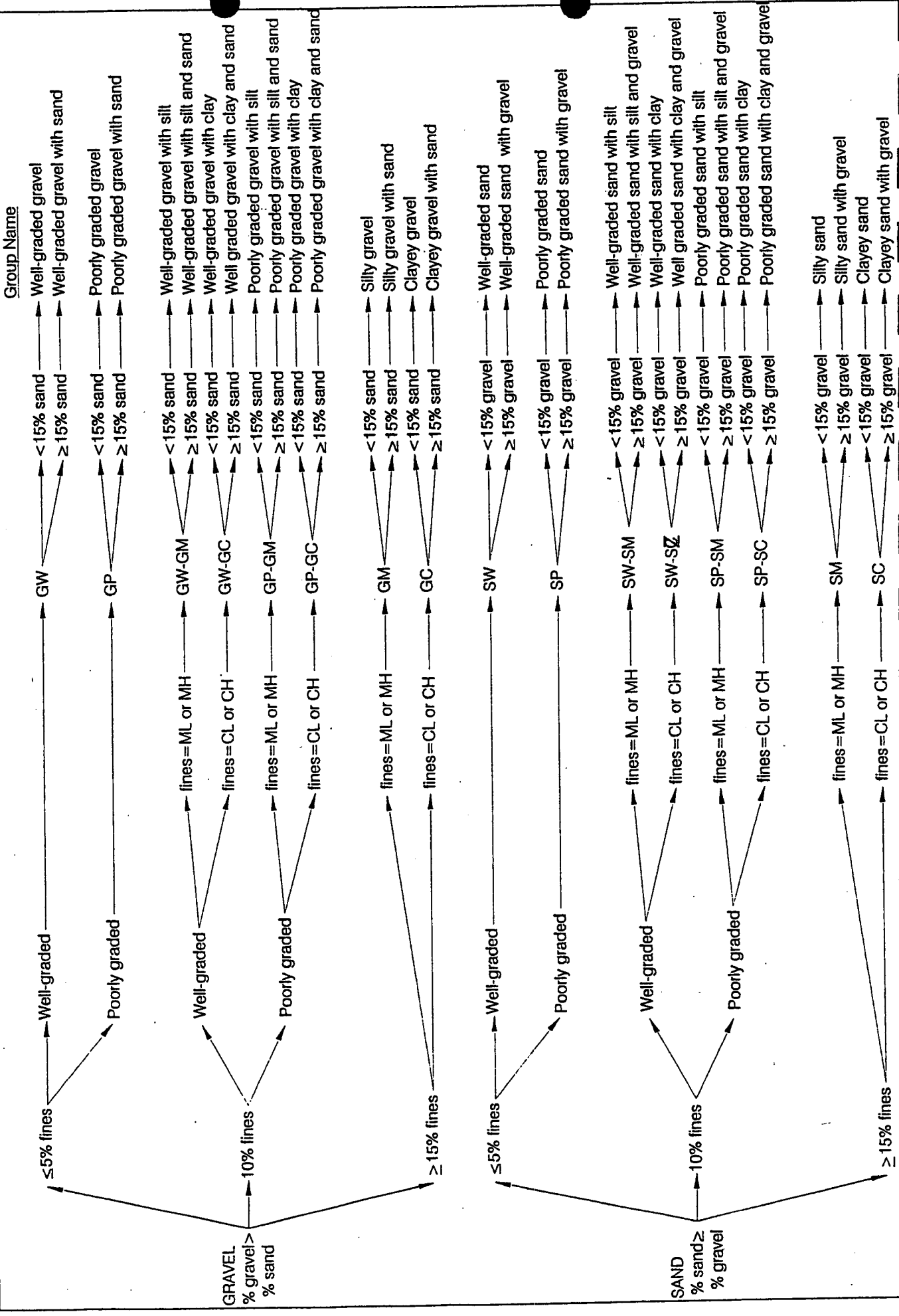
The purpose of this test is to indicate the range of moisture contents present in the soil. A wet sample is weighed, placed in the constant temperature oven at 105° for 24 hours, and re-weighed. The moisture content is the change in weight divided by the dry weight.

UNIFIED CLASSIFICATION SYSTEM

| MAJOR DIVISIONS | | GRAPH SYMBOLS | LETTER SYMBOL | TYPICAL DESCRIPTIONS | |
|---|--|---|---|---|--|
| COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS <u>LARGER</u> THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION <u>RETAINED</u> ON NO. 4 SIEVE |  | GW | WELL-GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND | |
| | |  | GP | POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND | |
| | |  | GM | SILTY GRAVEL SILTY GRAVEL WITH SAND | |
| | |  | GC | CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND | |
| | MORE THAN 50% OF COARSE FRACTION <u>PASSING</u> NO. 4 SIEVE | SAND AND SANDY SOILS CLEAN SAND (LITTLE OR NO FINES) |  | SW | WELL-GRADED SAND WELL-GRADED SAND WITH GRAVEL |
| | | |  | SP | POORLY GRADED SAND POORLY GRADED SAND WITH GRAVEL |
| | | SANDS WITH FINES (APPRECIABLE AMT. OF FINES) |  | SM | SILTY SAND SILTY SAND WITH GRAVEL |
| | | |  | SC | CLAYEY SAND CLAYEY SAND WITH GRAVEL |
| | | |  | ML | SILT, SILT WITH SAND, SANDY SILT GRAVELLY SILT, GRAVELLY SILT WITH SAND |
| | | |  | CL | LEAN CLAY WITH SAND, SANDY LEAN CLAY, GRAVELLY LEAN CLAY WITH SAND |
| MORE THAN 50% OF MATERIAL IS <u>SMALLER</u> THAN NO. 200 SIEVE SIZE | SILT AND CLAYS LIQUID LIMIT <u>LESS</u> THAN 50 |  | OL | ORGANIC CLAY, SANDY ORGANIC CLAY, ORGANIC SILT, SANDY ORGANIC SILT WITH GRAVEL | |
| | |  | MH | ELASTIC SILT WITH SAND, SANDY ELASTIC SILT, GRAVELLY ELASTIC SILT WITH SAND | |
| | SILT AND CLAYS LIQUID LIMIT <u>GREATER</u> THAN 50 |  | CH | FAT CLAY WITH SAND, SANDY FAT CLAY, GRAVELLY FAT CLAY WITH SAND | |
| | |  | OH | ORGANIC CLAY WITH SAND, SANDY ORGANIC CLAY, ORGANIC SILT, SANDY ORGANIC SILT | |
| HIGHLY ORGANIC SOILS | |  | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS | |

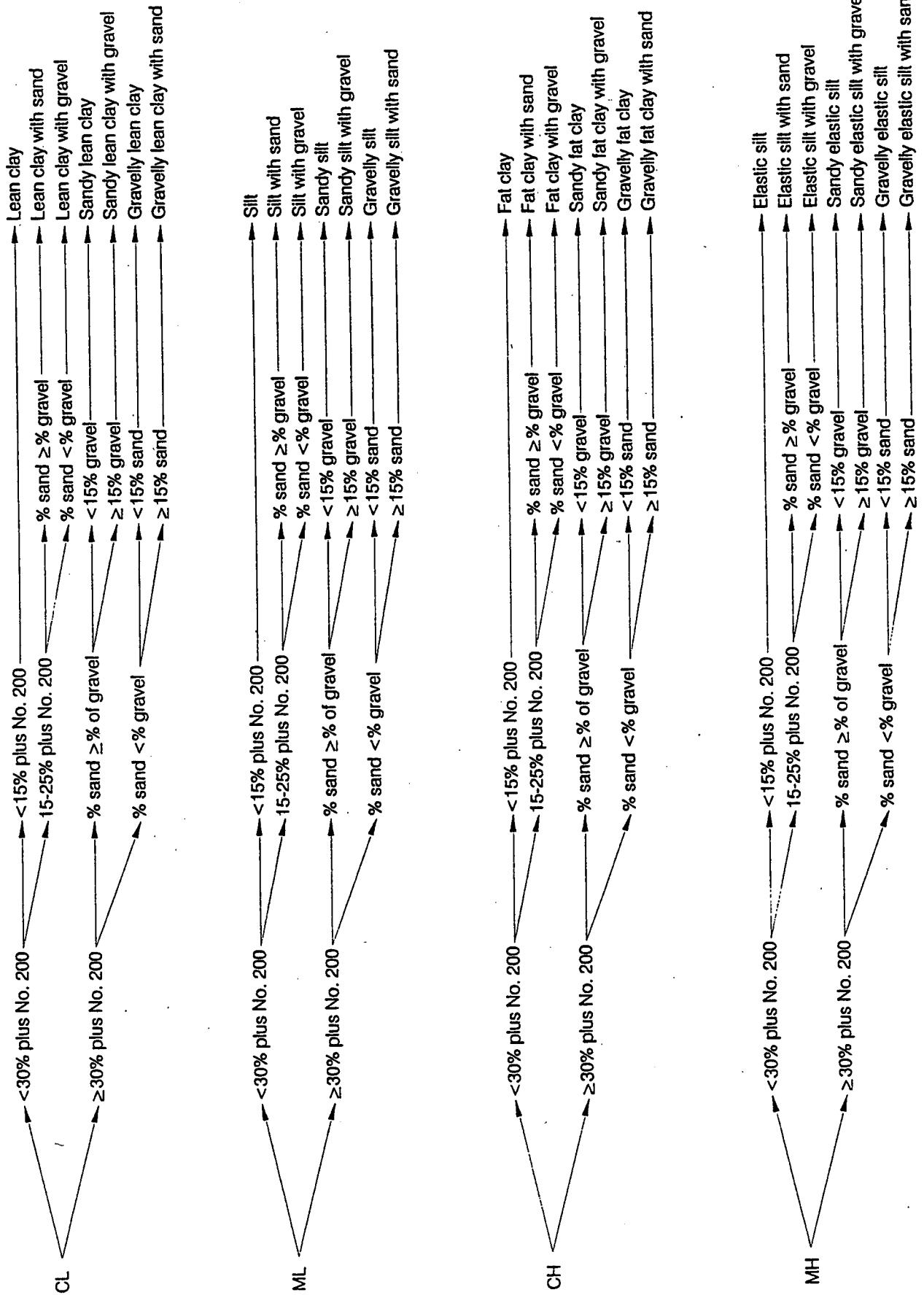


Flow Chart for Visually Identifying Soils Based on ASTM D-2488



Flow Chart for Visually Identifying Soils Based on ASTM D-2488

Group Name



III. BORING LOGS



**BOWSER
MORNER**

RECORD OF
 SUBSURFACE INVESTIGATION

CLIENT Haworth, Meyer, and Bolevn, Inc.
Frankfort, Kentucky
 PROJECT US 27 & Groggins Ferry Road Elevated Tank

REPORT No. 110189

LOCATION OF BORING See Plan

GROUND ELEV. 1030.30 TYPE AUGER HSA

DRILLING COMMENTS _____

DATE, START 1/7/97 FINISH 1/7/97

DRILLERS DH

| DEPTH, FT | SAMPLE NO. | DEPTH OF SAMPLE, FT | | TYPE SAMPLE | BLOWS PER 6 IN INTERVAL OR RQD% / REC% | DEPTH OF STRATUM, FT | GRAPHICS | CLASSIFICATION OF MATERIAL | | STANDARD PENETRATION NUMBER, "N" |
|-----------|------------|---------------------|------|-------------|--|----------------------|----------|--|----------------------|----------------------------------|
| | | FROM | TO | | | | | Major Component: | Minor Component Term | |
| 0.3 | | | | | | | | Topsoil | | |
| 1 | 1C | 1.0 | 3.0 | C | | | | (Natural) Brown very stiff Sandy Fat CLAY-moist | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | 1A | 3.5 | 5.0 | A | 7 | | | | | 25 |
| 5 | | | | | 11 | | | | | |
| 6 | | | | | 14 | | | | | |
| 7 | 2A | 6.5 | 8.0 | A | 7 | | | | | 17 |
| 8 | | | | | 8 | | | | | |
| 9 | | | | | 9 | | | | | |
| 8.5 | 1B | 8.5 | 10.0 | B | 93/100 | | | Auger refusal at 8.5 feet Start rock core at 8.5 feet | | |
| 10.0 | | | | | | | | LIMESTONE, light grey, thin bedded, very hard | | |
| 11 | | | | | | | | VOID | | |
| 11.3 | 2B | 11.3 | 16.3 | B | 86/100 | | | LIMESTONE, light grey, thin bedded, very hard | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 16.3 | 3B | 16.3 | 21.3 | B | 100/100 | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 21.3 | | | | | | | | | | |

GROUND INITIAL dry DATE 1/7/97
 WATER AT COMPLETION
 OBSERVATIONS OTHER

A — SPLIT SPOON
 B — ROCK CORE
 C — SHELBY TUBE
 D — OTHER

RECORD OF
SUBSURFACE INVESTIGATION

CLIENT Haworth, Meyer, and Boleyn, Inc.

REPORT No. 110189

PROJECT Frankfort, Kentucky

US 27 & Groggins Ferry Road Elevated Tank

LOCATION OF BORING See Plan

GROUND ELEV. 1031.30 TYPE AUGER HSA

DATE, START 1/7/97 FINISH 1/7/97

DRILLING COMMENTS _____

DRILLERS DH

| DEPTH, FT | SAMPLE NO. | DEPTH OF SAMPLE, FT | | TYPE SAMPLE | BLOWS PER 6 IN INTERVAL OR ROD% / REC% | DEPTH OF STRATUM, FT | GRAPHICS | CLASSIFICATION OF MATERIAL | | | STANDARD PENETRATION NUMBER "N" |
|-----------|------------|---------------------|------|-------------|--|----------------------|----------|--|----------------------|--------|---------------------------------|
| | | FROM | TO | | | | | Major Component: | Minor Component Term | | |
| | | | | | | | | Gravel | Trace | 1-10% | |
| | | | | | | | | Sand | Some | 11-35% | |
| | | | | | | | | Silt | And | 36-50% | |
| | | | | | | | | Clay | | | |
| 0.3 | | | | | | | | Topsoil | | | |
| 1 | 1A | 1.0 | 2.5 | A | 3 | | | Brown stiff to very stiff Sandy Fat CLAY-moist | | | 10 |
| 2 | | | | | 4 | | | | | | |
| | | | | | 6 | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | 2A | 3.5 | 5.0 | A | 6 | | | | | | 25 |
| 5 | | | | | 11 | | | | | | |
| | | | | | 14 | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | 3A | 6.5 | 8.0 | A | 10 | | | | | | 25 |
| 8 | | | | | 12 | | | | | | |
| | | | | | 13 | | | | | | |
| 9 | 4A | 9.0 | 10.5 | A | 7 | | | | | | 19 |
| 10 | | | | | 8 | | | | | | |
| | | | | | 11 | | | | | | |
| 12 | | | | | | | | | | | |
| 12.4 | | | | | | | | Auger refusal at 12.4 feet | | | |
| 13 | 1B | 12.4 | 17.4 | B | 88/100 | | | Start core at 12.4 feet | | | |
| 14 | | | | | | | | LIMESTONE, light grey, thin bedded, very hard | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | 2B | 17.4 | 22.4 | B | 88/98 | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | | | | | | | | | | | |
| | | | | | | 22.4 | | | | | |

GROUND INITIAL dry DATE 1/7/97
 WATER AT COMPLETION _____
 OBSERVATIONS OTHER _____

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — OTHER

RECORD OF
SUBSURFACE INVESTIGATION

CLIENT Haworth, Meyer, and Boleyn, Inc.

REPORT No. 110189

PROJECT Frankfort, Kentucky

US 27 & Groggins Ferry Road Elevated Tank

LOCATION OF BORING See Plan

GROUND ELEV. 1029.70 TYPE AUGER HSA

DRILLING COMMENTS _____

DATE, START 1/7/97 FINISH 1/7/97

DRILLERS DH

| DEPTH, FT | SAMPLE NO. | DEPTH OF SAMPLE, FT | | TYPE SAMPLE | BLOWS PER 6 IN INTERVAL OR ROD% / REC% | DEPTH OF STRATUM, FT | GRAPHICS | CLASSIFICATION OF MATERIAL | | | STANDARD PENETRATION NUMBER, "N" |
|-----------|------------|---------------------|------|-------------|--|----------------------|----------|---|----------------------|--------|----------------------------------|
| | | FROM | TO | | | | | Major Component: | Minor Component Term | | |
| | | | | | | | | Gravel | Trace | 1-10% | |
| | | | | | | | | Sand | Some | 11-35% | |
| | | | | | | | | Silt | And | 36-50% | |
| | | | | | | | | Clay | | | |
| 0.3 | | | | | | | | TopSoil | | | |
| 1 | 1A | 1.0 | 2.5 | A | 3 | | | Brown stiff to very stiff Sandy Fat Clay-moist | | | 7 |
| 2 | | | | | 4 | | | | | | |
| 3 | | | | | 3 | | | | | | |
| 4 | 2A | 3.5 | 5.0 | A | 5 | | | | | | 17 |
| 5 | | | | | 7 | | | | | | |
| 6 | | | | | 10 | | | | | | |
| 6 | 1C | 6.0 | 8.0 | C | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | 3A | 9.0 | 10.5 | A | 8 | | | | | | 21 |
| 10 | | | | | 9 | | | | | | |
| 11 | | | | | 12 | | | | | | |
| 12 | | | | | | | | | | | |
| 12.6 | | | | | | 12.6 | | Auger refusal at 12.6 feet Start core at 12.6 feet | | | |
| 13 | 1B | 12.6 | 17.6 | B | 88/98 | | | LIMESTONE, light grey, thin bedded, very hard | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | 2B | 17.6 | 22.6 | B | 88/100 | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | | | | | | | | | | | |
| | | | | | | 22.6 | | | | | |

GROUND INITIAL dry DATE 1/7/97

WATER AT COMPLETION

OBSERVATIONS OTHER

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — OTHER

RECORD OF
SUBSURFACE INVESTIGATION

CLIENT Haworth, Meyer, and Boleyn, Inc.

REPORT No. 110189

Frankfort, Kentucky

PROJECT US 27 & Groggins Ferry Road Elevated Tank

LOCATION OF BORING See Plan

GROUND ELEV. 1030.60 TYPE AUGER HSA

DATE, START 1/7/97 FINISH 1/7/97

DRILLING COMMENTS _____

DRILLERS DH

| DEPTH, FT | SAMPLE NO. | DEPTH OF SAMPLE, FT | | TYPE SAMPLE | BLOWS PER 6 IN INTERVAL OR ROD% / REC% | DEPTH OF STRATUM, FT GRAPHICS | CLASSIFICATION OF MATERIAL | | | STANDARD PENETRATION NUMBER "N" |
|-----------|------------|---------------------|------|-------------|--|-------------------------------|---|----------------------|--------|---------------------------------|
| | | FROM | TO | | | | Major Component: | Minor Component Term | | |
| | | | | | | | Gravel | Trace | 1-10% | |
| | | | | | | | Sand | Some | 11-35% | |
| | | | | | | | Silt | And | 36-50% | |
| | | | | | | | Clay | | | |
| 0.3 | | | | | | | TopSoil | | | |
| 1 | 1A | 1.0 | 2.5 | A | 3 | | Brown stiff to very stiff Sandy Fat CLAY | | | 10 |
| 2 | | | | | 4 | | | | | |
| 3 | | | | | 6 | | | | | |
| 4 | 2A | 3.5 | 5.0 | A | 8 | | | | | 25 |
| 5 | | | | | 11 | | | | | |
| 6 | | | | | 14 | | | | | |
| 7 | 3A | 6.5 | 7.4 | A | 4 | | | | | 50/4" |
| 8 | 1B | 7.7 | 10.8 | B | 50/4" | 7.7 | Auger refusal at 7.7 feet Start core at 7.7 feet | | | |
| 9 | | | | | 58/100 | | LIMESTONE, light grey, thin bedded, very hard | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | 10.8 | VOID | | | |
| 12 | 2B | 12.0 | 17.0 | B | 92/100 | 12.0 | LIMESTONE, light grey, thin bedded, very hard | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | 3B | 17.0 | 22.0 | B | 100/100 | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | 22.0 | | | | |

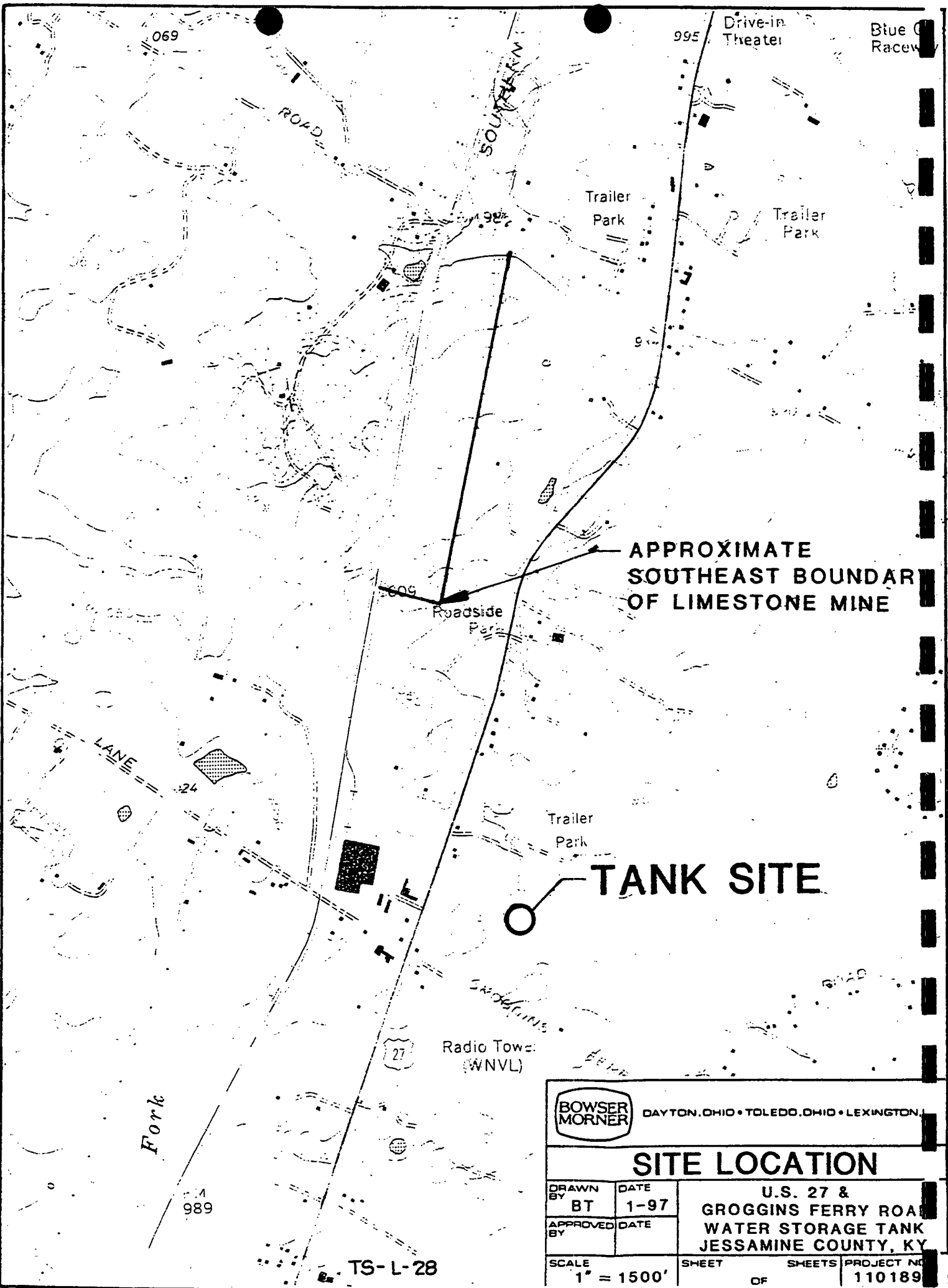
GROUND INITIAL dry DATE 1/7/97
 WATER AT COMPLETION _____
 OBSERVATIONS OTHER _____

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — OTHER

IV. SITE LOCATION MAP
BORING LAYOUT



**BOWSER
MORNER**



BOWSER MORNER

DAYTON, OHIO • TOLEDO, OHIO • LEXINGTON, KY

SITE LOCATION

DRAWN BY BT DATE 1-97

APPROVED BY DATE

U.S. 27 & GROGGINS FERRY ROAD WATER STORAGE TANK JESSAMINE COUNTY, KY

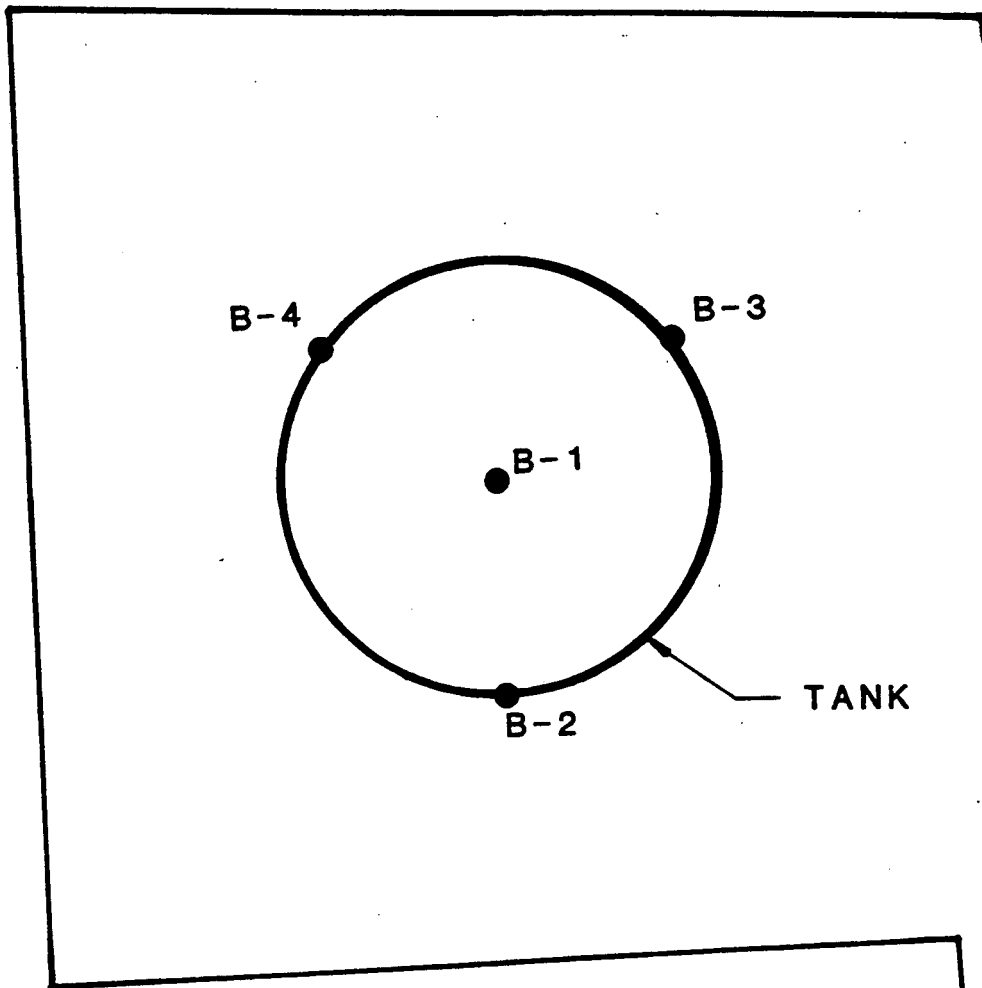
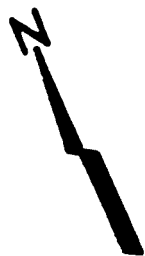
SCALE 1" = 1500'

SHEET OF SHEETS

PROJECT NO. 110189


523630

TS-L-28



LEGEND

- BORING LOCATIONS

| | | | |
|---|----------|---|------------------------------|
|  | | DAYTON, OHIO • TOLEDO, OHIO • LEXINGTON, KY. | |
| BORING LAYOUT | | | |
| DRAWN BY | DATE | U.S. 27 & GROGGINS FERRY ROAD WATER STORAGE TANK JESSAMINE COUNTY, KY. | |
| BT | 1-97 | | |
| APPROVED BY | DATE | | |
| SCALE | 1" = 30' | SHEET OF | SHEETS PROJECT NO. 110189 |

TS-L-29

523630

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, due in large measure to programs and publications of ASFE/ The Association of Engineering Firms Practicing in the Geosciences.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of the report may affect its recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used:*

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems which may develop if they are not consulted after factors considered in their report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by geo-

technical engineers who then render an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those inferred to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultants through the construction stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.*

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

Geotechnical engineers' reports are prepared to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. Unless indicated otherwise, this report was prepared expressly for the client involved and expressly for purposes indicated by the client. Use by any other persons for any purpose, or by the client for a different purpose, may result in problems. *No individual other than the client should apply this report for its intended purpose without first conferring with the geotechnical engineer. No person should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by geotechnical engineers based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report* prepared or authorized for their use. Those who do not provide such access may proceed un-

der the *mistaken impression* that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist geotechnical engineers' liabilities onto someone else. Rather, they are definitive clauses which identify where geotechnical engineers' responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, ASFE has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

Published by

ASFE THE ASSOCIATION
OF ENGINEERING FIRMS
PRACTICING IN THE GEOSCIENCES

8811 Colesville Road/Suite G106/Silver Spring, Maryland 20910/(301) 565-2733

0788/3M

CONTRACT IV

JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND PUMP STATION

APRIL, 1999

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as _____. * To the _____ (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all work for the construction of _____ in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

By submission of this bid, each BIDDER certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that this bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this bid with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence work under this contract on or before a date to be specified in the Notice to Proceed and to fully complete the project within 270 consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of \$250 for each consecutive calendar day that the work remains incomplete after the expiration date of the contract.

BIDDER acknowledges receipt of the following Addenda:

Addendum No. _____ Addendum No. _____ Addendum No. _____

The BIDDER hereby proposes to furnish and do all that is required by the contract to which this refers for the construction of all structures listed at the prices shown for each bid item on the following Bid Schedule. (The Bid Schedule attached lists the various divisions of construction contemplated in the Plans and Specifications, together with an estimate of the units of each. With these units as the basis, the BIDDER will extend each item, using the cost he inserts in the unit column. Any total cost found inconsistent with the unit cost when the bids are examined will be deemed in error and corrected to agree with the unit cost which shall be considered correct).

*Insert "a corporation", "a partnership", or "an individual" as applicable.

The undersigned BIDDER does hereby declare and stipulate that this proposal is made in

pursuance of and subject to all terms and conditions of the Instructions to Bidders, the Construction Contract, the Technical Specifications, and the Plans pertaining to the work to be done, all of which have been examined by the undersigned.

Accompanying this proposal is a certified check or standard bid bond (5% of the Total Bid) in the sum of _____ dollars (\$_____) in accordance with the Instructions to Bidders.

The undersigned BIDDER agrees to execute the contract and Performance and Payment Bond for the amount of the total of this bid within 10 calendar days from the date when the written Notice of Award of the contract is delivered to him at the address given in this proposal. The name and address of the corporate surety with which the BIDDER proposes to furnish the specified Performance and Payment Bond is as follows:

All the various phases of work enumerated in the Technical Specifications with their individual jobs and overhead, whether specifically mentioned, included by implication or appurtenant thereto, are to be performed by the Contractor under one of the items listed in the Bid Schedule, irrespective of whether it is named in said list.

Payment for work performed will be in accordance with the Bid Schedule, subject to changes as provided for the Construction Contract.

The BIDDER understands that the OWNER reserves the right to reject any or all bids and to waive any informalities in the bidding.

The BIDDER agrees that this bid shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Bids shall include sales tax and all other applicable taxes and fees.

BID SCHEDULE

| <u>Item</u> <u>No.</u> | <u>Item</u> | <u>Unit</u> | <u>Total</u> |
|---------------------------|---|-------------|--------------|
| 1. | 1,000,000 Gallon (nominal) Elevated Water Storage Tank including, but not limited to tank foundation, valve vault, site preparation, excavation, fencing, connection to existing line, valves, piping, and all appurtenances, as shown on the Plans and Specifications, complete in place | L.S. | _____ |
| 2. | Mainline Pressure Reducing Valve Station including, but not limited to valves, piping, fittings, conc. vault as shown on the Plans and Specifications, complete in place. | L.S. | _____ |
| 3. | Radio Telemetry Control System including but not limited to two (2) RTU's located at the new tank and pump station, conduit and wiring from the existing pump station to the proposed flow control valve as shown on the Plans and Specifications, complete in place. | L.S. | _____ |
| 4. | Underground Booster Pump Station including, but not limited to 2- <u>350</u> gpm pumps, piping, controls, capsule, heaters, fans, lights, ladder, dehumidifier, sump pump, valves, fittings, sitework, fencing, gate, concrete and conduit as shown on the Plans and Specification, complete in place | L.S. | _____ |

5. Flow Control Valve Station including, but not limited to valves, piping, wiring from the booster pump station fittings, conc. vault and all appurtenances, as shown on the Plans and Specifications, complete in place.

L.S.

TOTAL BID PRICE (Items 1 through 5)

*Contractor shall note that apparent low bidder shall be determined by the Total Bid Price of Item 1 through 5.

Method of Payment shall be by bid unit. Contractor should review the Standard Details and the Specifications, especially the Special Conditions, when bidding this project.

The above prices shall include all labor, materials, bailing, shoring, removal, overhead, profit, insurance, etc., to cover the finished work of the several kinds called for, complete in place.

(Contractor

(Date)

By _____

(Title)

(Business Address)

(Phone Number)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____

_____ as Principal, and _____

_____ as Surety, are hereby held and firmly bound unto _____

_____ as OWNER in the penal sum of

_____ for the payment of which, well and truly

to be made, we hereby jointly and severally bind ourselves, successors and assigns. Signed, this

____ day of _____, 19 ____.

The Condition of the above obligation is such that whereas the Principal has submitted to _____

a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing,

for the _____

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attachment hereto (properly completed in accordance with said BID) and shall furnish a BOND for faithful performance of said contract, and for the payment of all persons performing labor, furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal (L.S.)

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

COMPLIANCE STATEMENT

This statement relates to a proposed contract with _____

(Name of borrower or grantee)

who expects to finance the contract with assistance from the Farmers Home Administration, United States Department of Agriculture (whether by a loan, grant, loan insurance, guarantee, or other form of financial assistance). I am the undersigned bidder or prospective contractor. I represent that -----

1. I have, have not, participated in a previous contract or subcontract subject to executive order 11246 (regarding equal employment opportunity) or a preceding similar Executive order.
2. If I have participated in such a contract or subcontract, I have, have not, filed all compliance reports that I have been required to file in connection with the contract or subcontract.

If the proposed contract is for \$50,000 or more and I have 50 or more employees, I also represent that -----

3. I have, have not previously had contracts subject to the written affirmative action program requirements of the Secretary of Labor.
4. If I have participated in such a contract or subcontract, I have, have not, developed and placed on file at each establishment affirmative action programs as required by the rules and regulations of the Secretary of Labor.

I understand that if I have failed to file any compliance reports that have been required of me, I am not eligible and will not be eligible to have my bid considered or to enter into the proposed contract unless and until I make an arrangement regarding such reports that is satisfactory to the Farmers Home Administration or to the office where the reports are required to be filed.

I also certify that I do not maintain or provide for my employees any segregated facilities at any of my establishments, and that I do not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I certify further that I will not maintain or provide for my employees any segregated facilities at any of my establishments, and that I will not permit my employees to perform their services at any location, under my control, where segregated facilities are maintained. I agree that a breach of this certification is a violation of the Equal Opportunity clause in my contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national origin, because of habit, local custom, or otherwise. I further agree that (except where I have obtained identical certifications for proposed subcontractors for specific time periods) I will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that I will retain such certifications in my files; and that I will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods): (See Reverse).

Position 6

BS-8

FmHA 400-6 (Rev. 12-16-75)

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENTS FOR
CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A certification of Nonsegregated Facilities, as required by the May 9, 1967, order (32F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Date _____

Signature of Bidder or Prospective Contractor

Address (including Zip Code)

CERTIFICATION FOR CONTRACTS, GRANTS AND LOANS

The undersigned certifies; to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant or Federal loan, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant or loan.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant or loan, the undersigned shall complete and submit Standard Form - LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including contracts, subcontracts, and subgrants under grants and loans) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

(name)

(date)

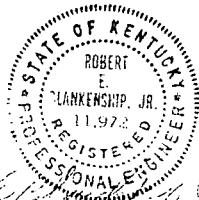
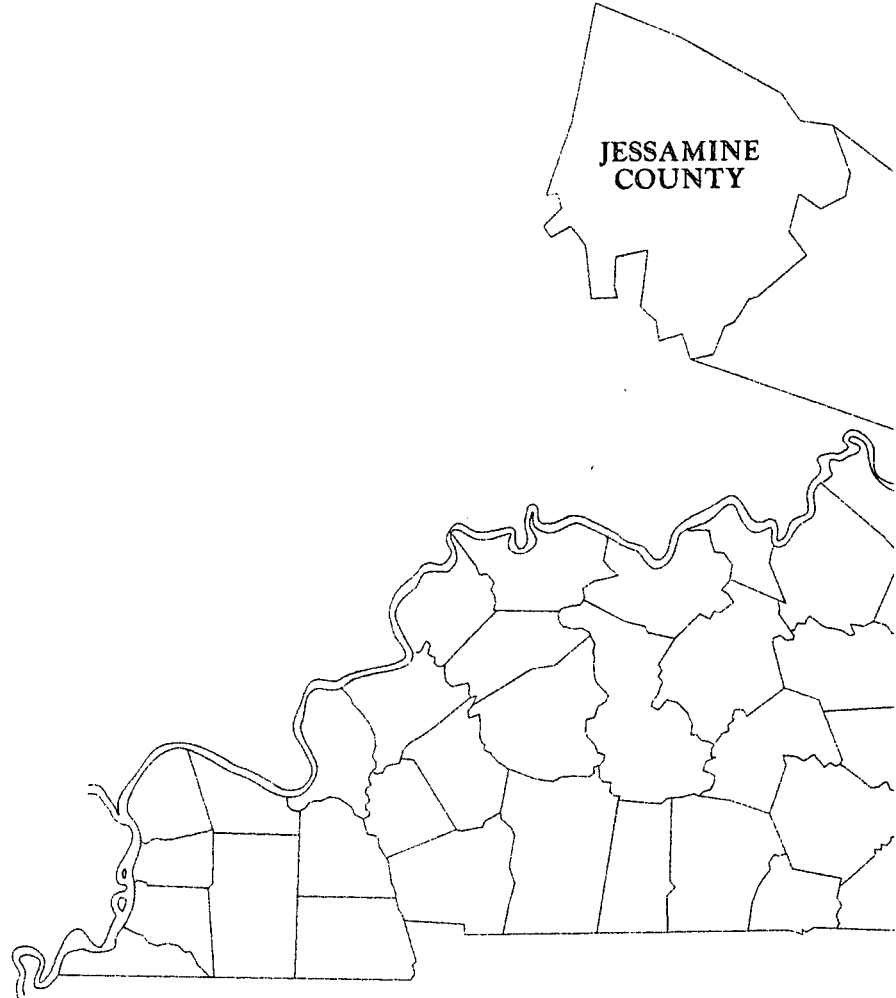
(title)

oOo



ROBERT E. BLANKENSHIP, JR.
KENTUCKY P.E. #11972

AND BOOSTER CONTI

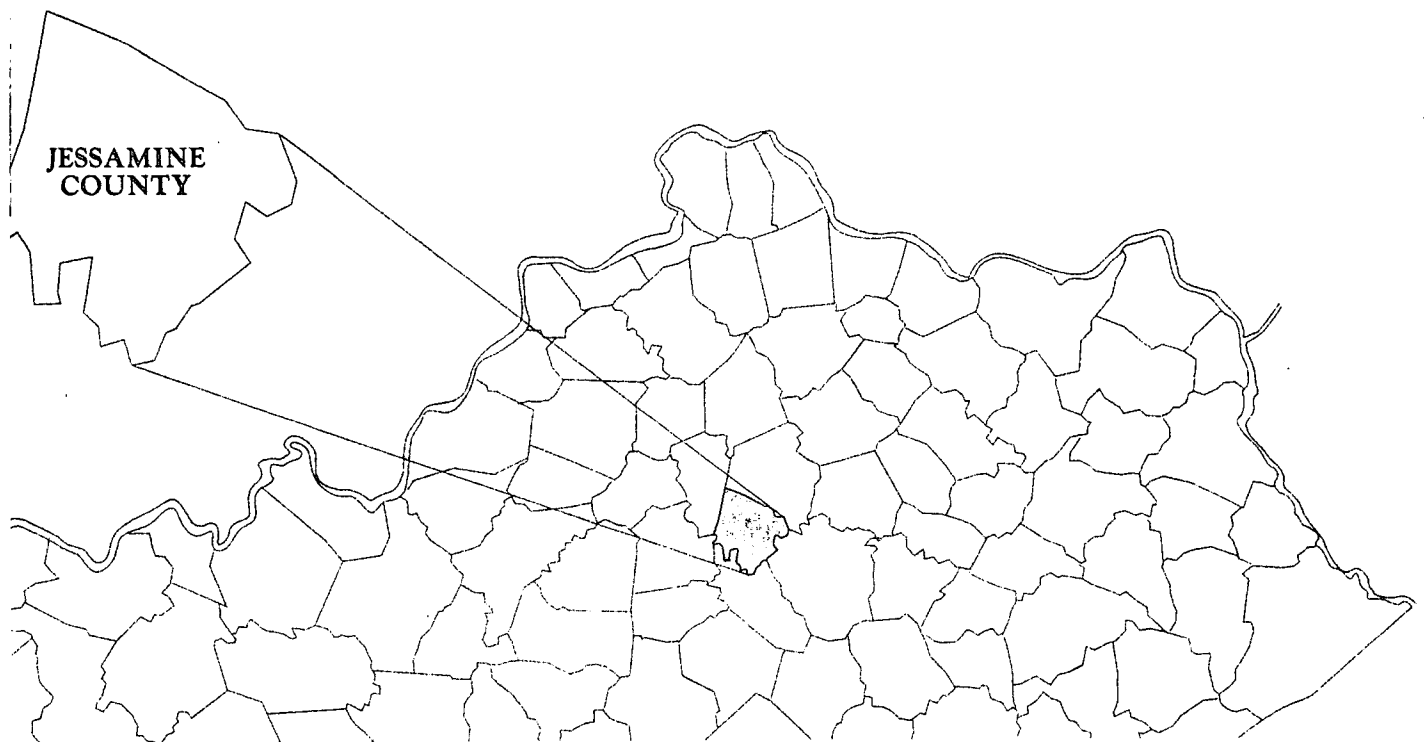


Robert E. Lankenship, Jr.

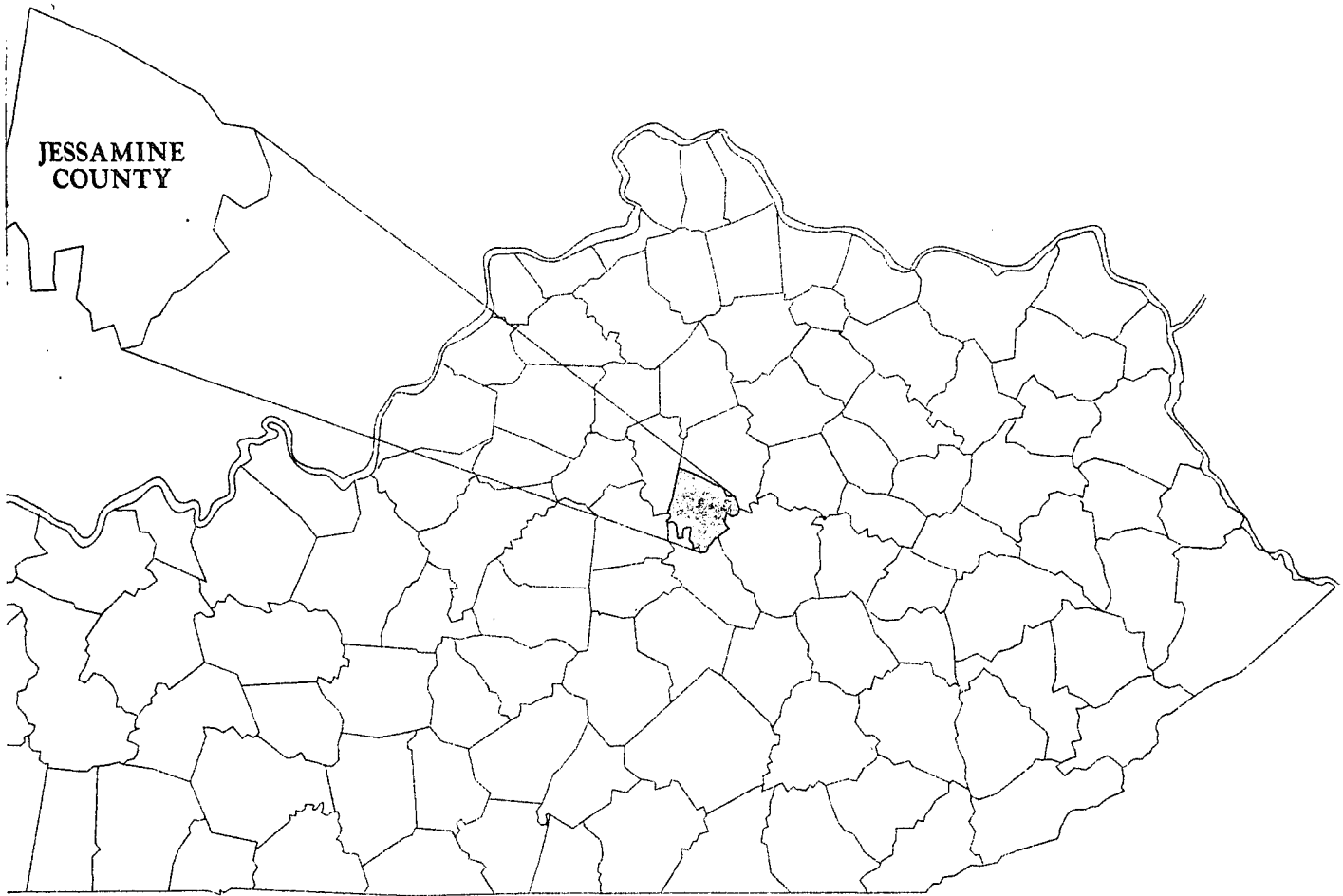
LANKENSHIP, JR.
P.E. #11972

JUN

*MINE COUNTY
DISTRICT NO.
GALLON ELEVATED
STORAGE TANK
PUMP STATION
CONTRACT IV*



WATER PUMP STATIC CONTRACT IV



PLANS PREPARED BY:



JUNE 1998

3 HMB Circle
Frankfort, Kentucky

VTY

NO. 1

ATED

NK

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ATION



PLANS PREPARED BY:



Haworth, Meyer & Boleyn, Inc.

ENGINEERS • ARCHITECTS • PLANNERS

3 HMB Circle
Frankfort, Kentucky

(502)695-9800
Fax (502)695-9810

ALL PRICE BID FOR PIPE

ALL INCLUDED IN THE

ALL DAMAGE TO EXISTING UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER

ALL TEES AND BENDS SHALL BE THRUST BLOCKED AS DETAILED ON THE THRUST BLOCK DETAIL SHEET

THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION ACTIVITY TO THE AREA WITHIN THE EXISTING EASEMENTS AND CONSTRUCTION LIMITS, UNLESS OTHERWISE APPROVED IN WRITING BY THE OWNER

THE CONTRACTOR WILL BE SOLELY LIABLE FOR ANY WORK HE PERFORMS OUTSIDE OF LEGAL EASEMENTS OR CONSTRUCTION LIMITS.

OPTIC SYSTEMS MAY BE LOCATED IN SOME AREAS. CONTRACTOR TO EXERCISE CAUTION IN THESE AREAS. WATER MAIN TO BE ENCASED IN CONCRETE WHEN LAID WITHIN 10' OF DRAIN LINES OR FIELD. SEE DETAIL AND NOTE ON STANDARD DETAIL SHEET.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN THE LOCATIONS OF ANY AND ALL UTILITIES ENCOUNTERED BY THE FINAL ALIGNMENT OF WATERLINE. THE CONTRACTOR SHALL USE CAUTION WHEN EXCAVATING AND SHALL TAKE THE NECESSARY MEASURES TO PROTECT ALL EXISTING UTILITIES TO KEEP THEM IN SERVICE. IF UTILITIES ARE SHOWN, THE INFORMATION IS GENERAL IN NATURE AND NOT TO BE TAKEN AS AS-BUILTS. CONTRACTOR SHALL CONTACT REPRESENTATIVES OF LOCAL UTILITIES A MINIMUM OF 48 HOURS BEFORE COMMENCING WORK ON THE PROJECT.

OTHER THAN THE SITE LOCATION MAP ON THIS SHEET THE MAINLINE WATER LOCATION SITE IS NOT SHOWN. CONTRACTORS BIDDING THE PROJECT SHOULD FIELD LOCATE THE PROJECT SITE PRIOR TO BIDDING THIS PROJECT.

LEGEND

| | |
|----------------------------------|---------|
| PROPOSED WATERLINE | |
| EXISTING WATERLINE | |
| PROPOSED BUTTERFLY VALVE | |
| EXISTING GATE OR BUTTERFLY VALVE | |
| WATER AIR RELEASE VALVE | |
| HYDRANT | |
| UTILITY LINE | |
| DIFFERENTIAL ASSEMBLY | |
| EXISTING SANITARY SEWER | |
| EXISTING GAS LINE | |
| EXISTING WATER METER | |
| EXISTING WATER METER | |
| WATER METER PANEL NUMBER | XX - XX |
| POLE | |

BM -
SET ALL CATS
GROUND
1:00

**JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY**

SHEET

1

OF

7

**SITE LOCATION MAP/TANK SITE SURVEY
TABLE OF CONTENTS/LEGEND/GENERAL NOTES**

Haw

GENERAL NOTES

ALL WATER MAINS SHALL BE PVC CLASS 200 SDR 21 UNLESS OTHERWISE NOTED ON THE PLANS.

UNLESS OTHERWISE NOTED, A SEPARATE BID ITEM HAS NOT BEEN ESTABLISHED FOR FITTINGS. THE FITTINGS INVOLVED BUT NOT LIMITED TO, TEES, BENDS, PLUGS, REDUCERS, SADDLES, CROSSES, COUPLINGS, ETC. CONTRACTOR SHALL INCLUDE THE COST OF THESE ITEMS IN THE UNIT PRICE FOR THE PIPE.

AT THE CONTRACTORS OPTION, CLASS 50 DUCTILE IRON PIPE MAY BE SUBSTITUTED FOR ANY PIPE PARTICULARLY SPECIFIED, BUT AT NO ADDITIONAL COST TO THE OWNER.

NO SEPARATE PAY ITEM HAS BEEN ESTABLISHED FOR CONNECTION TO EXISTING LINES. THE COST FOR CONNECTING TO EXISTING LINES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PIPE.

NO PAY ITEM FOR EXTRA TRENCH DEPTH HAS BEEN SET UP. CONTRACTOR SHALL INCLUDE THE COST OF THE ADDITIONAL DEPTH IN HIS UNIT PRICE WHEN THE WATER PIPE CROSSES UNDER AN EXISTING UTILITY CULVERT OR DRAINAGE DITCH.

FINAL LOCATION OF SERVICES, GATE VALVES AND OTHER APPURTENANCES ARE TO BE FIELD LOCATED DURING CONSTRUCTION AND APPROVED BY THE ENGINEER.

EXISTING UTILITIES, ESPECIALLY GAS LINES AND OIL LINES, MAY BE CATHODICALLY PROTECTED; THEREFORE, DUCTILE IRON PIPE, FITTINGS, GATE VALVES, AND/OR BOXES LAID WITHIN 100' OF THESE LINES WITH CATHODIC PROTECTION SHALL MEET THE REQUIREMENTS OF AWWA C-105. LATEST REVISION. A SEPARATE PAY ITEM HAS NOT BEEN ESTABLISHED. ALL COSTS FOR LABOR AND MATERIALS MUST BE INCLUDED IN THE UNIT PRICE BID FOR PIPE.

ALL DAMAGE TO EXISTING UTILITIES CAUSED BY THE CONTRACTOR'S OPERATION SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE OWNER.

ALL TEES AND BENDS SHALL BE THRUST BLOCKED AS DETAILED ON THE THRUST BLOCK DETAIL SHEET.

THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION ACTIVITY TO THE AREA WITHIN THE EXISTING EASEMENTS AND CONSTRUCTION LIMITS, UNLESS OTHERWISE APPROVED IN WRITING BY THE OWNER.




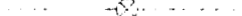
THE CONTRACTOR WILL BE SOLELY LIABLE FOR ANY WORK HE PERFORMS OUTSIDE OF LEGAL EASEMENTS OR CONSTRUCTION LIMITS.

SEWER SYSTEMS MAY BE LOCATED IN SOME AREAS. CONTRACTOR TO EXERCISE CAUTION IN THESE AREAS. WATER MAIN TO BE ENCASED IN CONCRETE WHEN LAID WITHIN 10' OF DRAIN LINES OR FIELD. SEE DETAIL AND NOTE ON STANDARD DETAIL SHEET.

IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ASCERTAIN THE LOCATIONS OF ANY AND ALL UTILITIES ENCOUNTERED BY THE FINAL ALIGNMENT OF WATERLINE. THE CONTRACTOR SHALL USE CAUTION WHEN EXCAVATING AND SHALL TAKE THE NECESSARY MEASURES TO PROTECT EXISTING UTILITIES TO KEEP THEM IN SERVICE. IF UTILITIES SHOWN, THE INFORMATION IS GENERAL IN NATURE AND NOT TO BE TAKEN AS AS-BUILTS. CONTRACTOR SHALL CONTACT REPRESENTATIVES OF LOCAL UTILITIES A MINIMUM OF 48 HOURS BEFORE COMMENCING WORK ON THE PROJECT.

EXCEPT FOR THE SITE LOCATION MAP ON THIS SHEET THE MAINLINE WATER MAIN LOCATION SITE IS NOT SHOWN. CONTRACTORS BIDDING THE PROJECT SHOULD FIELD LOCATE THE PROPOSED SITE PRIOR TO BIDDING THE PROJECT.

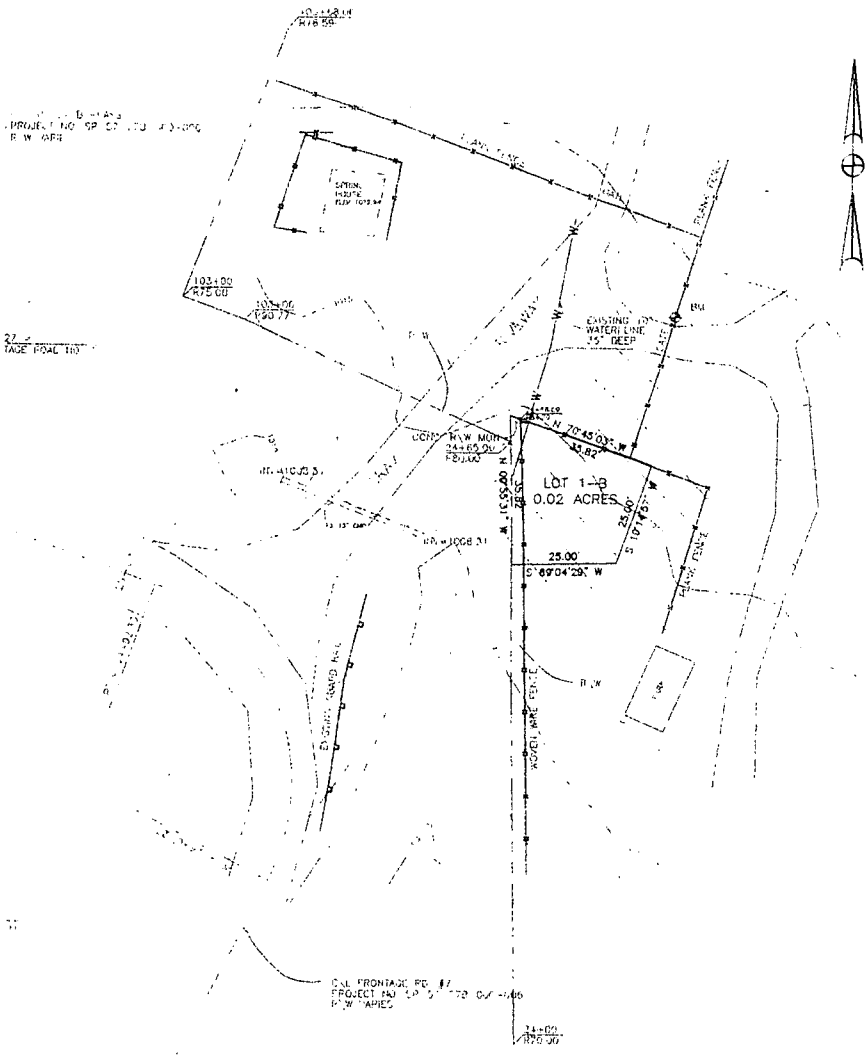
LEGEND

- EXISTING WATERLINE 
- PROPOSED WATERLINE 
- EXISTING BUTTERFLY VALVE 
- PROPOSED GATE OR BUTTERFLY VALVE 

31-33.3
5/24/67

UNLESS OTHERWISE REVISION A SEPA
 ALL COSTS FOR LABOR AND
 UNIT PRICE BID FOR PIPE

- 8 ALL DAMAGE TO EXISTING OPERATION SHALL BE REPAI TO THE OWNER.
9. ALL TEES AND BENDS SHALL THE THRUST BLOCK DETAIL.
- 10 THE CONTRACTOR SHALL CON AREA WITHIN THE EXISTING UNLESS OTHERWISE APPROVE
- 11 THE CONTRACTOR WILL BE S OUTSIDE OF LEGAL EASEMENT
- 12 SEPTIC SYSTEMS MAY BE LOC USE CAUTION IN THESE AREA CONCRETE WHEN LAID WITHIN SEC DETAIL AND NOTE ON ST
- 13 IT SHALL BE THE CONTRACTOR LOCATIONS OF ANY AND ALL ALIGNMENT OF WATERLINE. T EXCAVATING AND SHALL TAKE THE EXISTING UTILITIES TO K ARE SHOWN, THE INFORMATION TAKEN AS AS-BUILTS. CONTR OF LOCAL UTILITIES A MINIMU WORK ON THE PROJECT.
14. OTHER THAN THE SITE LOCATI PRV LOCATION SITE IS NOT S PROJECT SHOULD FIELD LOCAL THIS PROJECT.



LEG

- PROPOSED WATERLINE
- EXISTING WATERLINE
- PROPOSED BUTTERFLY VALVE
- EXISTING GATE OR BUTTERFLY
- AUTOMATIC AIR RELEASE VALV
- FIRE HYDRANT
- PROPERTY LINE
- BLOWOFF ASSEMBLY
- STREAM
- EXISTING SANITARY SEWER
- EXISTING GAS LINE
- PLUG
- FENCE
- PVA MAP - PARCEL NUMBER
- POWER POLE

PUMP STATION SITE SURVEY

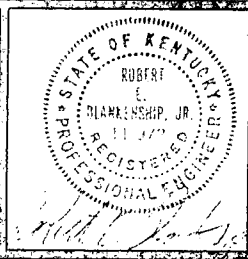
SCALE 1" = 30'

SURVEY PROVIDED BY HORNE ENGINEERING, INC

rth, Meyer & Boleyn, Inc.

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(502)695-9800
 Fax (502)695-9810



JESSAMINE CO
1,000,000 GALLON
AND
JESSA

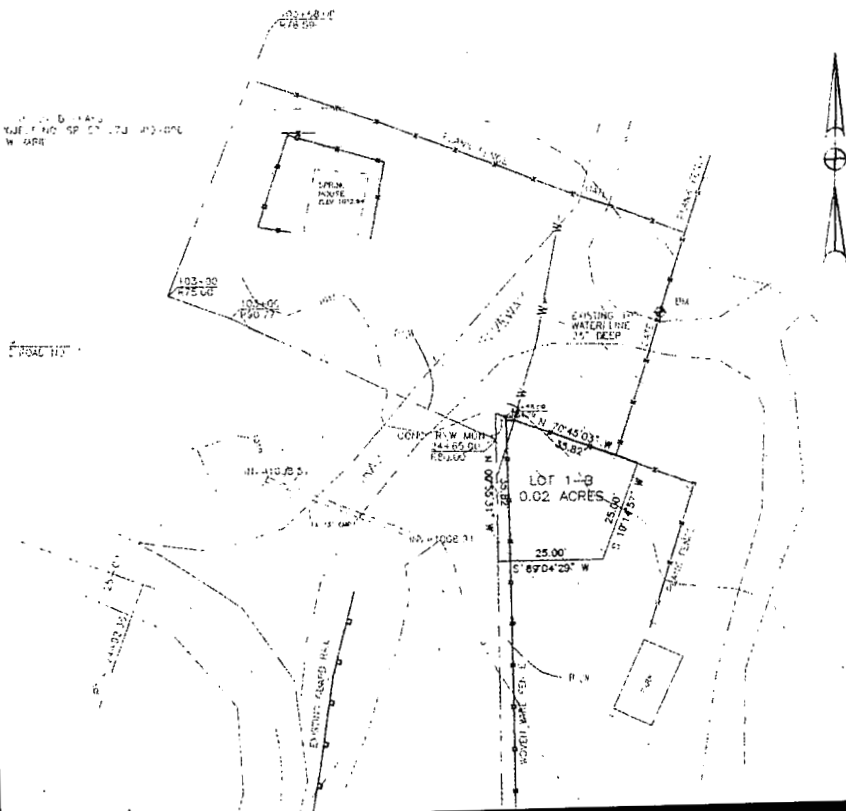
SITE LOCAT
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| STATION DETAILS | 5 |
| TANK DETAILS | 6 |
| PROPOSED WATERLINE | 7 |
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GENERAL NOTES

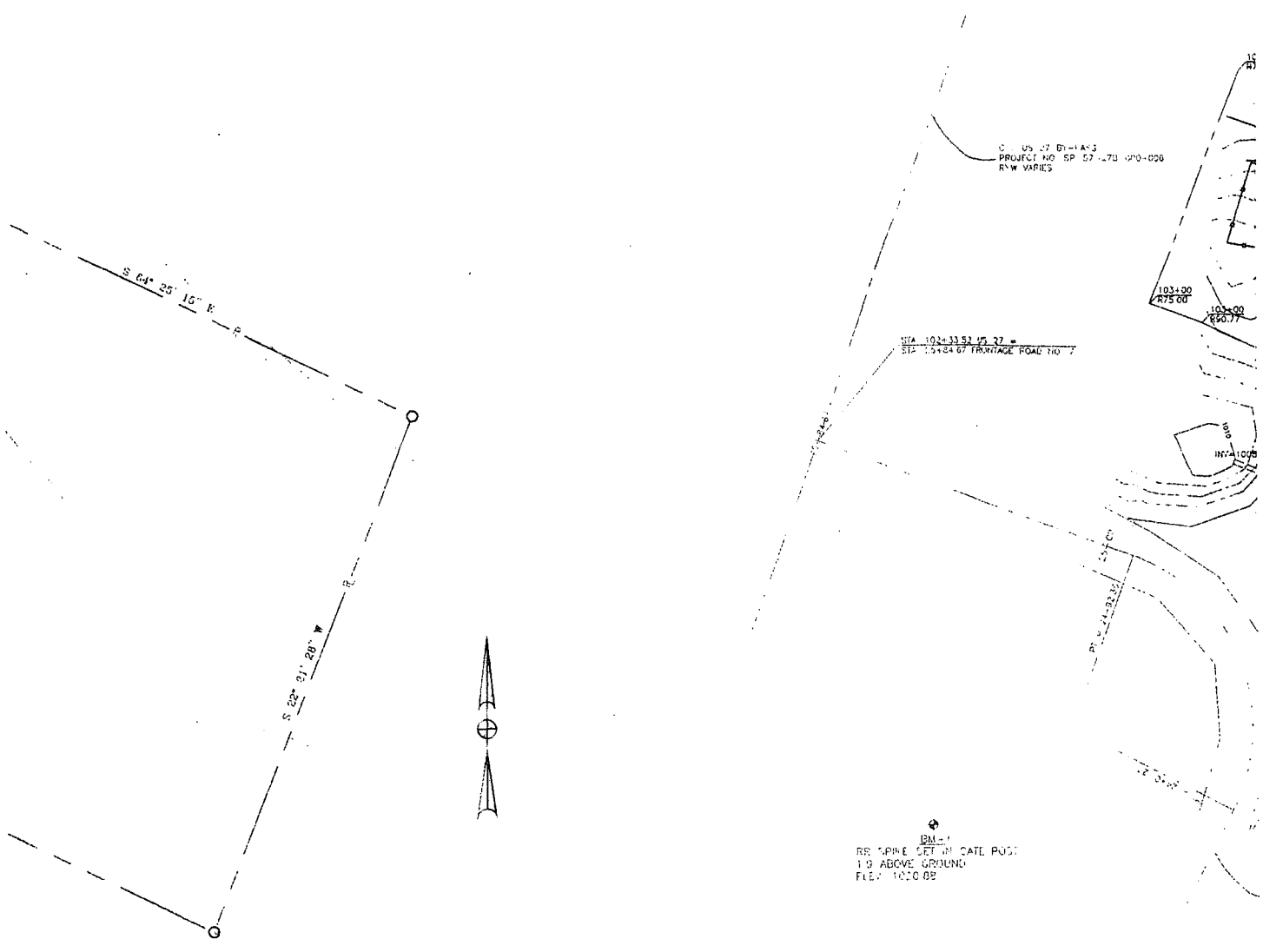
1. ALL WATER MAINS SHALL BE OTHERWISE NOTED ON THE PLAN.
2. UNLESS OTHERWISE NOTED, ESTABLISHED FOR FITTINGS, LIMITED TO, TEES, BENDS, P COUPLINGS, ETC. CONTRACTOR ITEMS IN THE UNIT PRICE FOR.
3. AT THE CONTRACTORS OPTION BE SUBSTITUTED FOR ANY PIPE NO ADDITIONAL COST TO THE OWNER.
4. NO SEPARATE PAY ITEM HAS TO EXISTING LINES. THE COST SHALL BE INCLUDED IN THE UNIT PRICE.
5. NO PAY ITEM FOR EXTRA TREE CONTRACTOR SHALL INCLUDE IN HIS UNIT PRICE WHEN THE EXISTING UTILITY CULVERT IS CUT.
6. FINAL LOCATION OF SERVICES APPURTENANCES ARE TO BE FIELD AND APPROVED BY THE ENGINEER.
7. EXISTING UTILITIES, ESPECIALLY CATHODICALLY PROTECTED; THE GATE VALVES, AND/OR BOXES; CATHODIC PROTECTION SHALL BE LATEST REVISION. A SEPARATE ALL COSTS FOR LABOR AND MATERIAL UNIT PRICE BID FOR PIPE.
8. ALL DAMAGE TO EXISTING UTILITY OPERATION SHALL BE REPAIRED TO THE OWNER.
9. ALL TEES AND BENDS SHALL BE THE THRUST BLOCK DETAIL SHOWN.
10. THE CONTRACTOR SHALL CONFIRM AREA WITHIN THE EXISTING EASEMENT UNLESS OTHERWISE APPROVED.
11. THE CONTRACTOR WILL BE RESPONSIBLE OUTSIDE OF LEGAL EASEMENTS.
12. SEPTIC SYSTEMS MAY BE LOCATED. USE CAUTION IN THESE AREAS. CONCRETE WHEN LAID WITHIN 10' SEE DETAIL AND NOTE ON STATION.
13. IT SHALL BE THE CONTRACTOR RESPONSIBILITY LOCATIONS OF ANY AND ALL UTILITIES ALIGNMENT OF WATERLINE. THE CONTRACTOR SHALL TAKE THE EXISTING UTILITIES TO BE SHOWN, THE INFORMATION TAKEN AS AS-BUILTS. CONTRACTOR OF LOCAL UTILITIES A MINIMUM WORK ON THE PROJECT.
14. OTHER THAN THE SITE LOCATION PRIVATE LOCATION SITE IS NOT SHOWN. PROJECT SHOULD FIELD LOCATE THIS PROJECT.



LEG

- PROPOSED WATERLINE
- EXISTING WATERLINE
- PROPOSED BUTTERFLY VALVE
- EXISTING GATE OR BUTTERFLY VALVE

AP



S. US 27 B1-A-3
PROJECT NO. SP 57-470-010-000
R/W VARIES

STA 103+33.52 (S 22' =
S12 154.84 07 BRIDGE ROAD TIO 7

103+00
275.00

103+00
280.77

BM-1
RE: SPINE SET IN CATE. POST
1.9' ABOVE GROUND
FILE: 1000.02

BY


4K SITE LOCATION

PUMP STATION

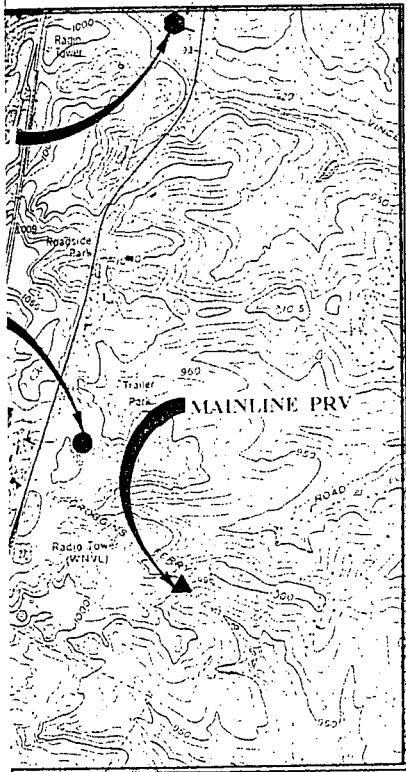
SCALE

SURVEY PROVIDED BY

| | | |
|------------------------------------|--------|------|
| PROJECT: 430.00 | | |
| SCALE AS NOTED DATE JUNE 1998 | | |
| DESIGNED BY | NAME | DATE |
| | LWC/JF | |
| DRAWN BY | DDM | |
| CHECKED BY | REB | |
| RECORD DRAWINGS | | |

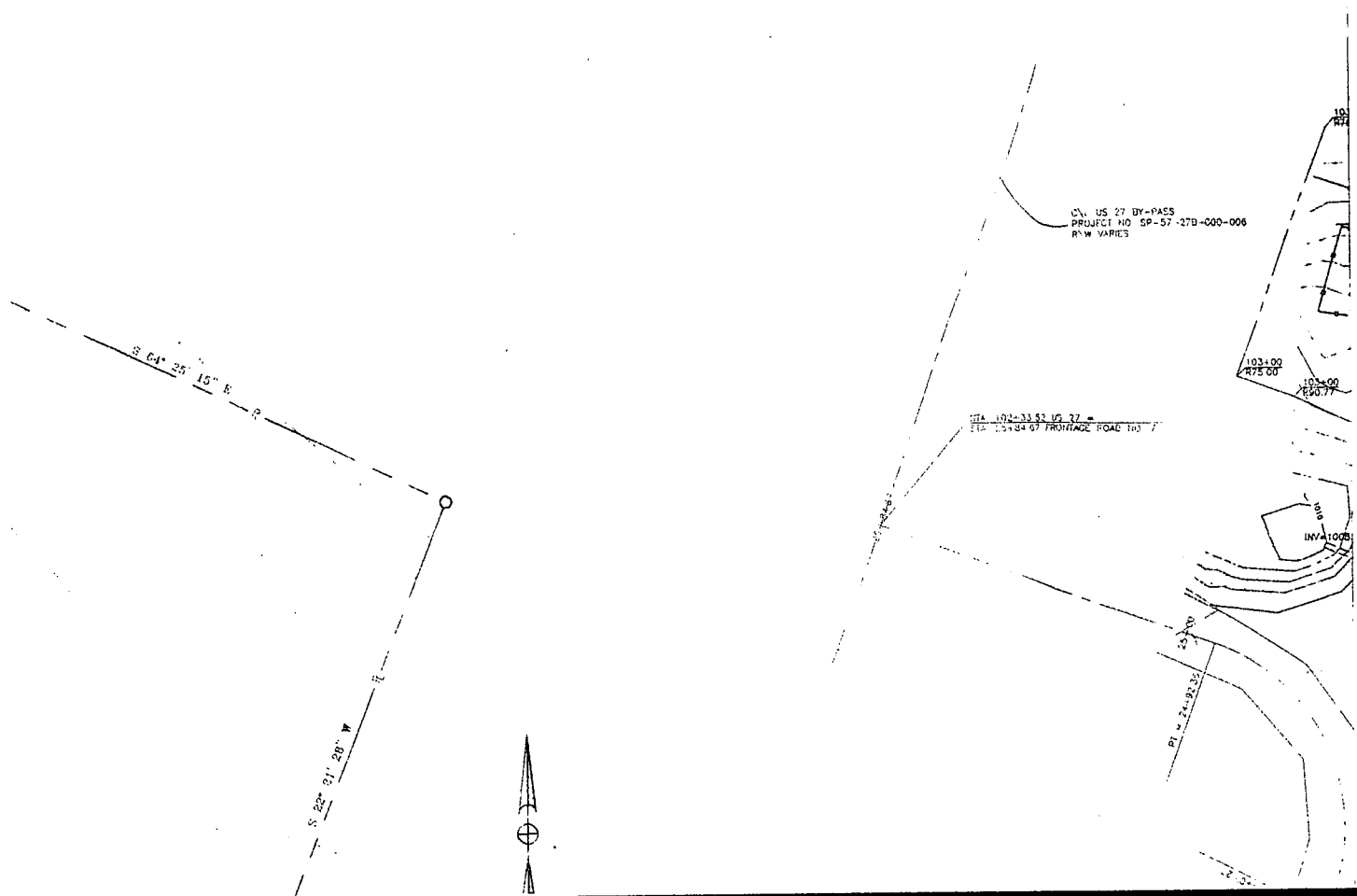

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 ENGINEERS • ARCHITECTS

3 HMB Circle
Frankfort, Kentucky

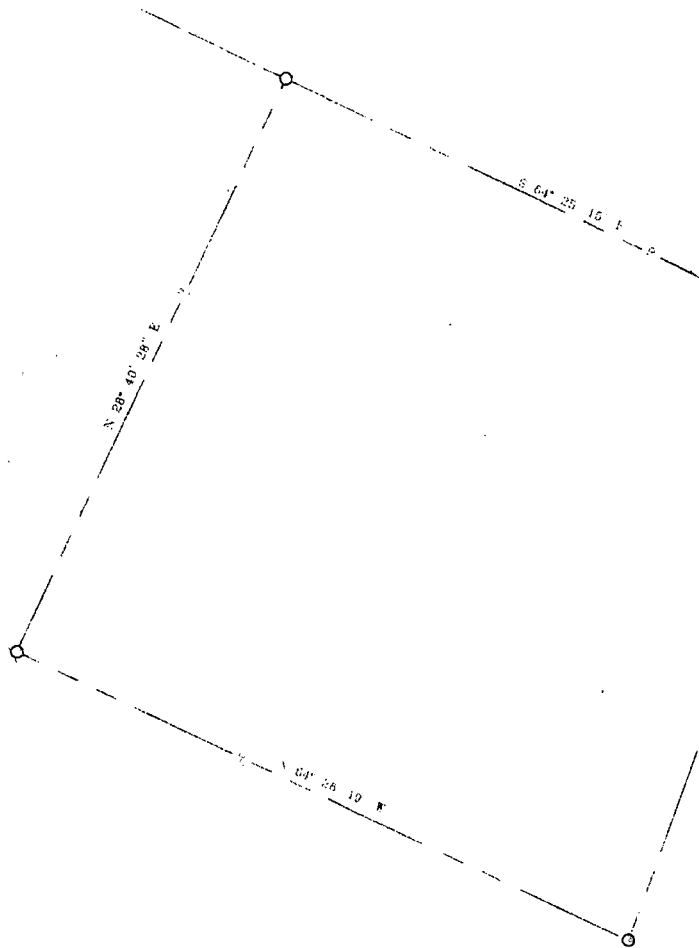


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| 104 | FLOW / UNIT / VALVE / SITE LOCATION |
| 105 | BOB FOR PUMP STATION / DETAIL |
| 106 | WATER STORAGE TANK / DETAIL |
| 107 | FLOW / UNIT / VALVE / DETAIL |
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SITE LOCATION MAP



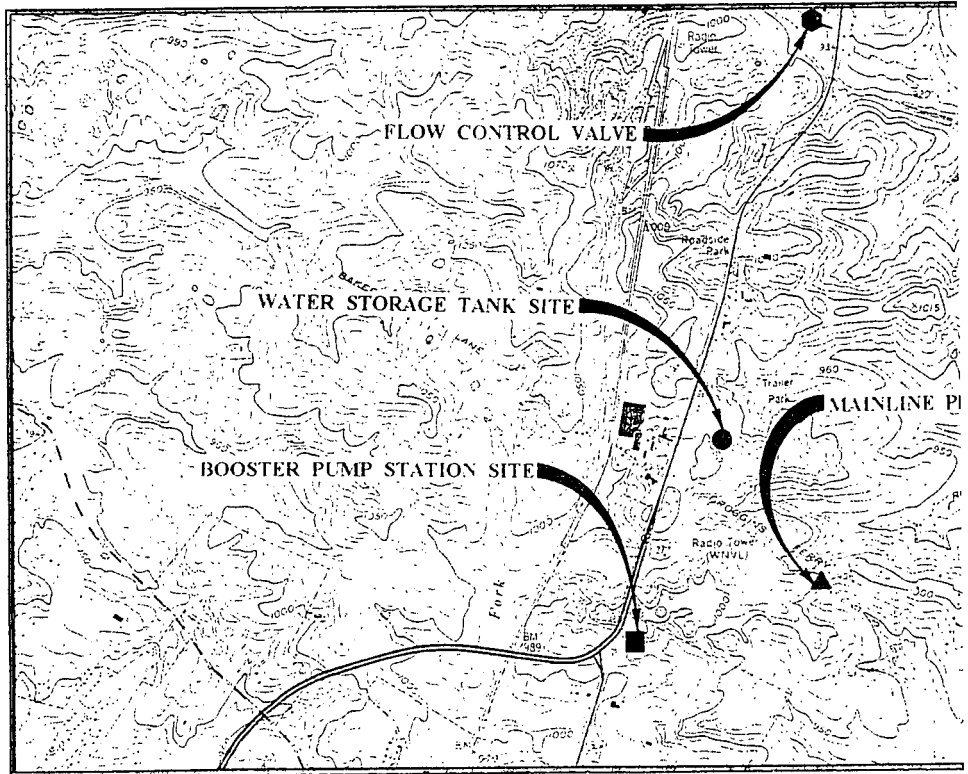
TANK SITE SURVEY

SCALE 1" = 50'

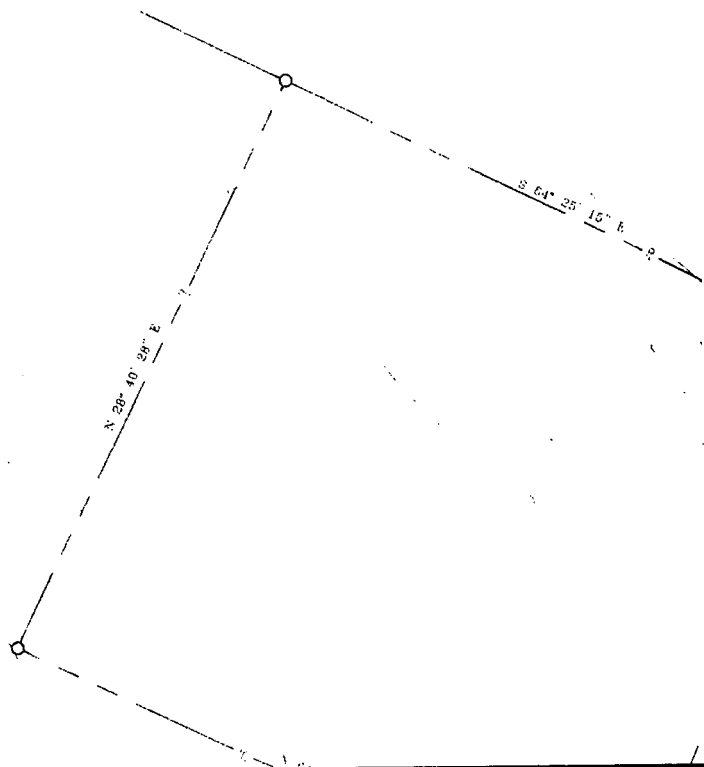
NOTE: SEE SHEET 3 FOR GENERAL TANK SITE LOCATION

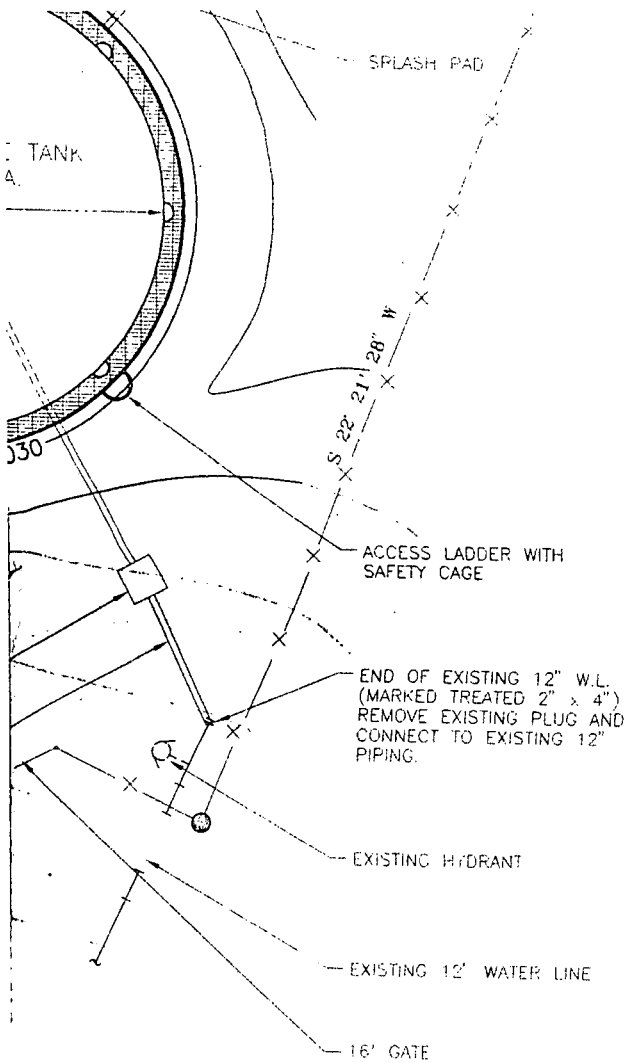
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|-----|------|----------|-------|--------|------|--------------------------|-----------|
| | | | | | | PROJECT 40000 | |
| | | | | | | SCALE AS NOTED DATE JUNE | |
| | | | | | | DESIGNED BY | NAME DATE |
| | | | | | | DRAWN BY | LWT/JP |
| | | | | | | CHECKED BY | DDM |
| | | | | | | RECORD DRAWINGS | FCB |
| NO. | DATE | REVISION | CHK'D | APPR'D | DATE | | |



SITE LOCATION MAP





TANK SITE LOCATION

RESPONSIBILITY
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**JESSAMINE COUNTY WATER DISTRICT NO. 1
 1,000,000 GALLON ELEVATED WATER STORAGE TANK
 AND BOOSTER PUMP STATION
 JESSAMINE COUNTY, KENTUCKY**

SHEET

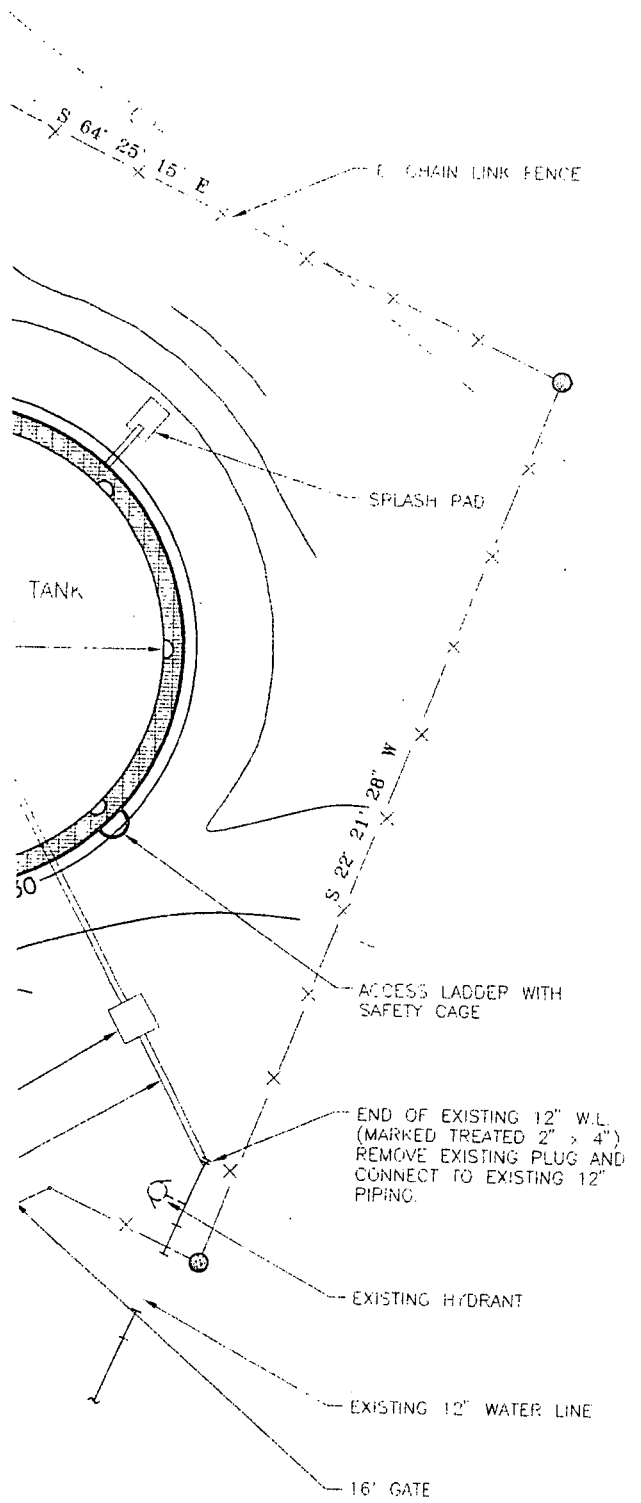
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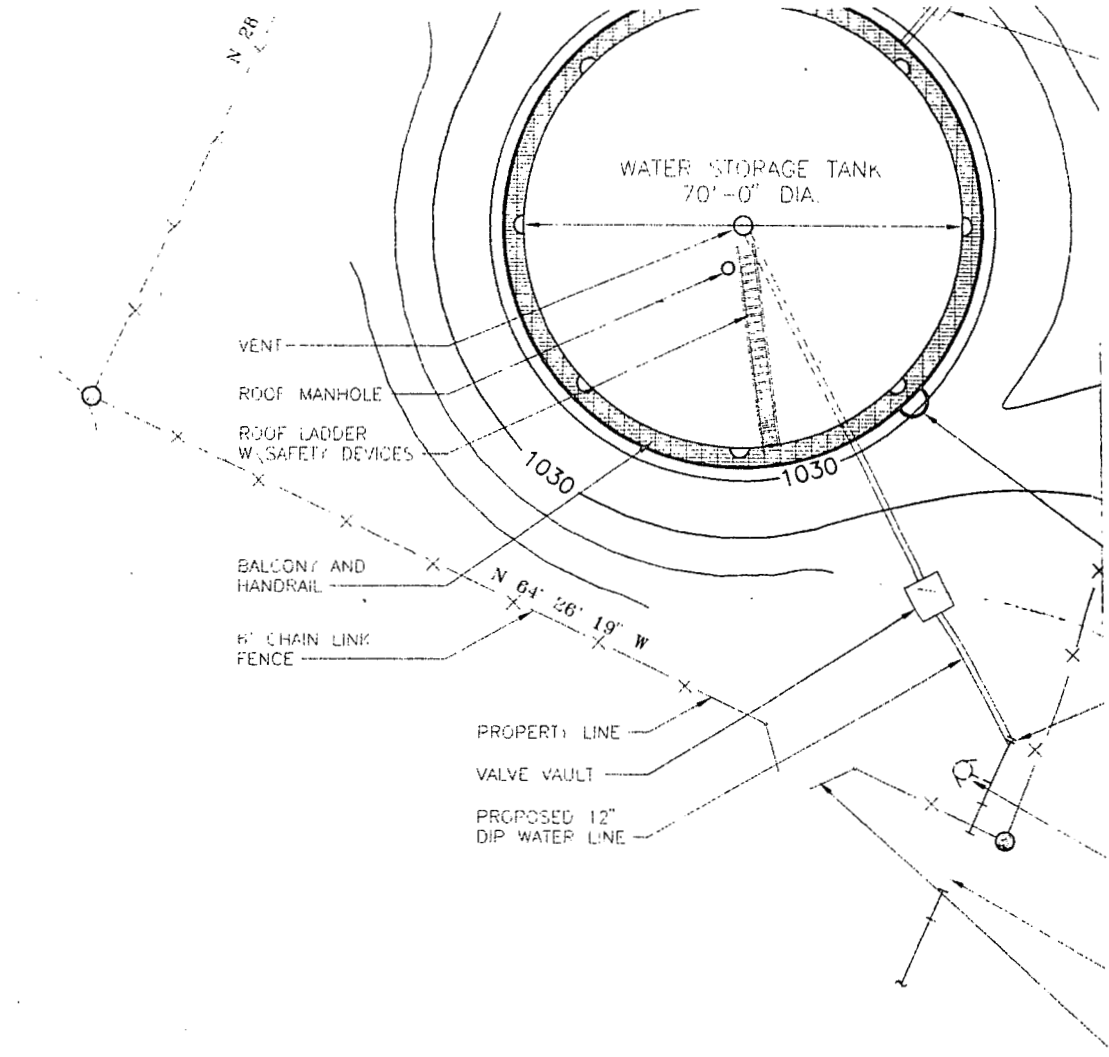
OF

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**WATER STORAGE TANK ELEVATION
 AND SITE PLAN**

Haw





SITE PLAN

SCALE 1" = 20'

NOTE: SEE SHEET 3 FOR GENERAL TANK SITE LOCATION

FOR FOUNDATION DESIGN
 RT IS INCLUDED IN THE
 V. THIS REPORT SHALL BE
 HE SHOP DRAWING SUBMITTAL

LOCATED BY THE CONTRACTOR

NSURE THAT RUNOFF IS AWAY

th, Meyer & Boleyn, Inc.

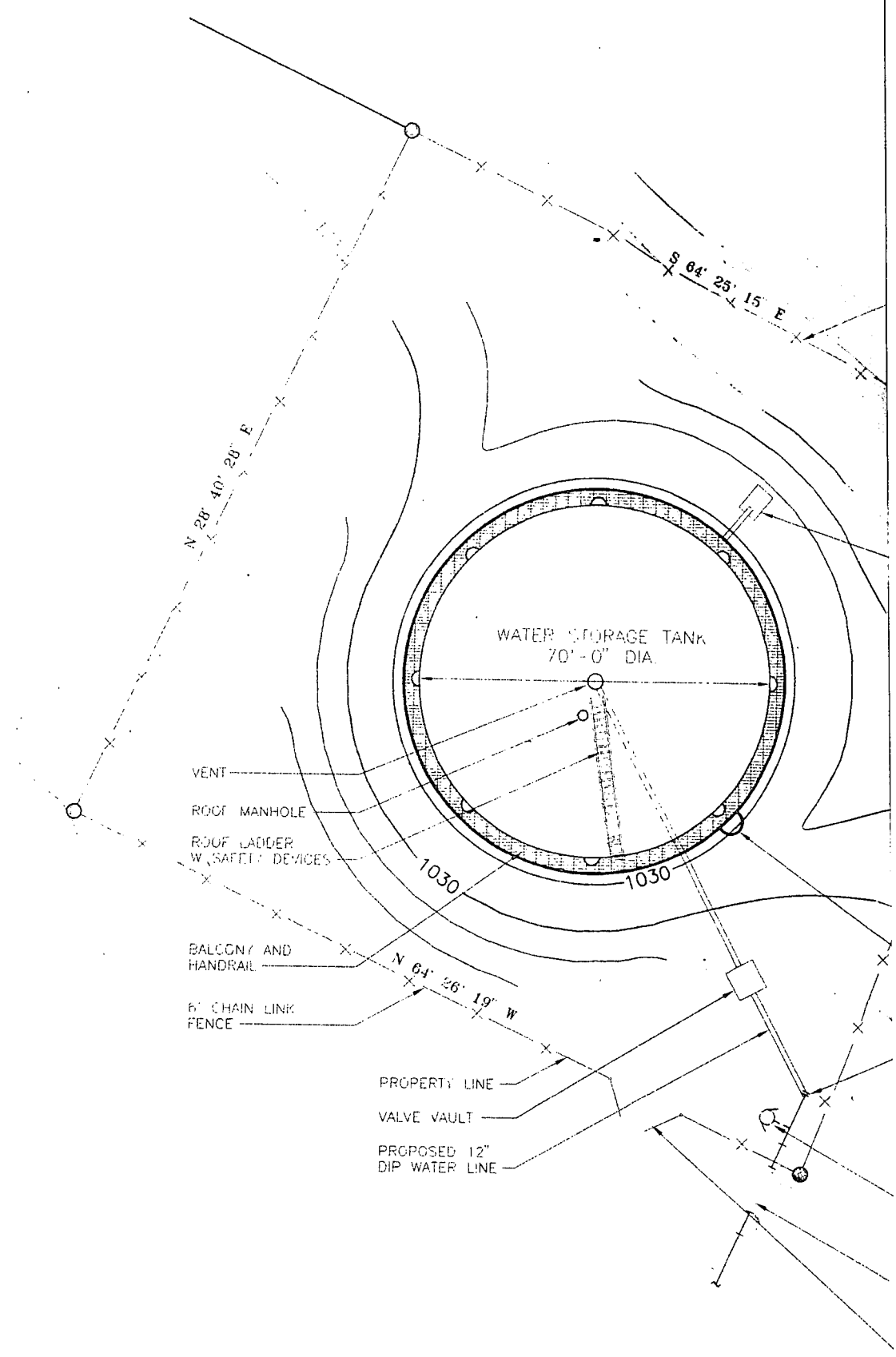
ENGINEERS • ARCHITECTS • PLANNERS

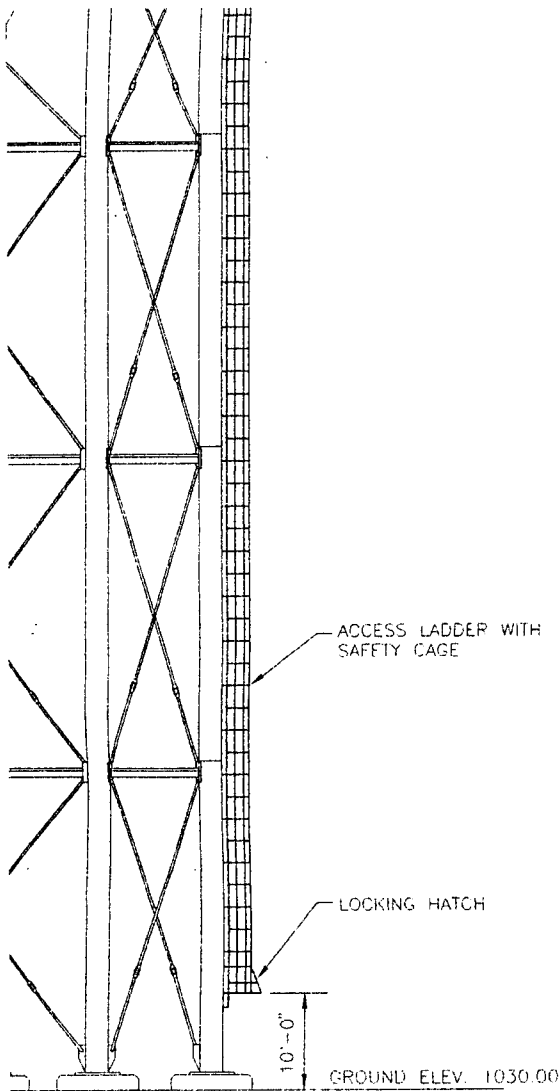
(502)695-9800
 Fax (502)695-9810



JESSAMINE CO
1,000,000 GALLON
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TANK ELEVATION

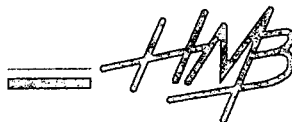
THIS SHEET FOR
FIELD LOCATIONS.

NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR FOUNDATION DESIGN. A SUBSURFACE INVESTIGATION REPORT IS INCLUDED IN THE SPECIFICATIONS. ANY DEVIATION FROM THIS REPORT SHALL BE SPECIFICALLY ADDRESSED DURING THE SHOP DRAWING SUBMITTAL PHASE OF THE PROJECT.
2. TANK APPURTENANCES TO BE FIELD LOCATED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
3. THE SITE SHALL BE REGRADED TO ENSURE THAT RUNOFF IS AWAY FROM THE TANK FOUNDATION.

PROJECT: 430.00
SCALE: AS NOTED DATE: JUNE 1998

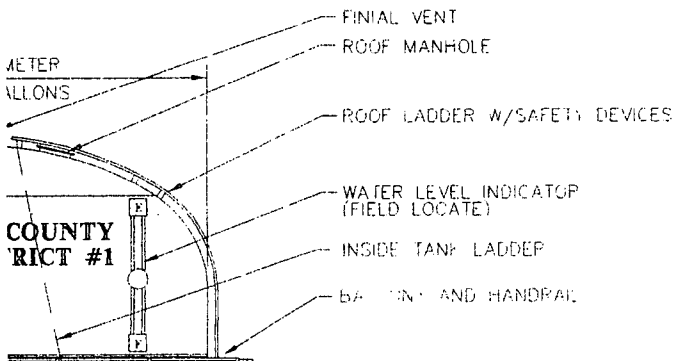
| | NAME | DATE |
|-----------------|--------|------|
| DESIGNED BY | LWC/JR | |
| DRAWN BY | DDM | |
| CHECKED BY | REB | |
| RECORD DRAWINGS | | |



Haworth, Meyer & E

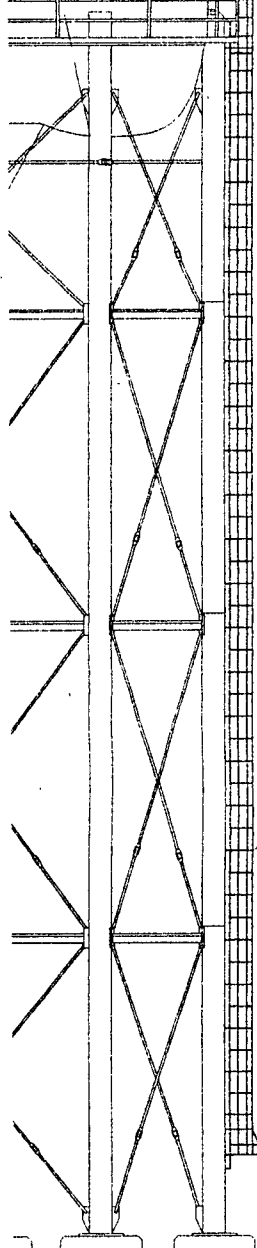
ENGINEERS • ARCHITECTS •

3 HMB Circle
Frankfort, Kentucky



COUNTY DISTRICT #1

METER
VALVES



10'-0"

GROUND ELEV. 1030.00

1.7" STEEL
OVERFLOW

185'-0" TOP OF FDN. TO HIGH WATER LINE

145'-0" TO LOW WATER LEVEL

12" FLAP VALVE
W/ SCREEN

CONCRETE PIPE
SUPPORT

ELEV. 1031.00

CONCRETE
SPLASH PAD

10'-0"
MIN.

8'-0" DIA. WET RISER

10'-0"

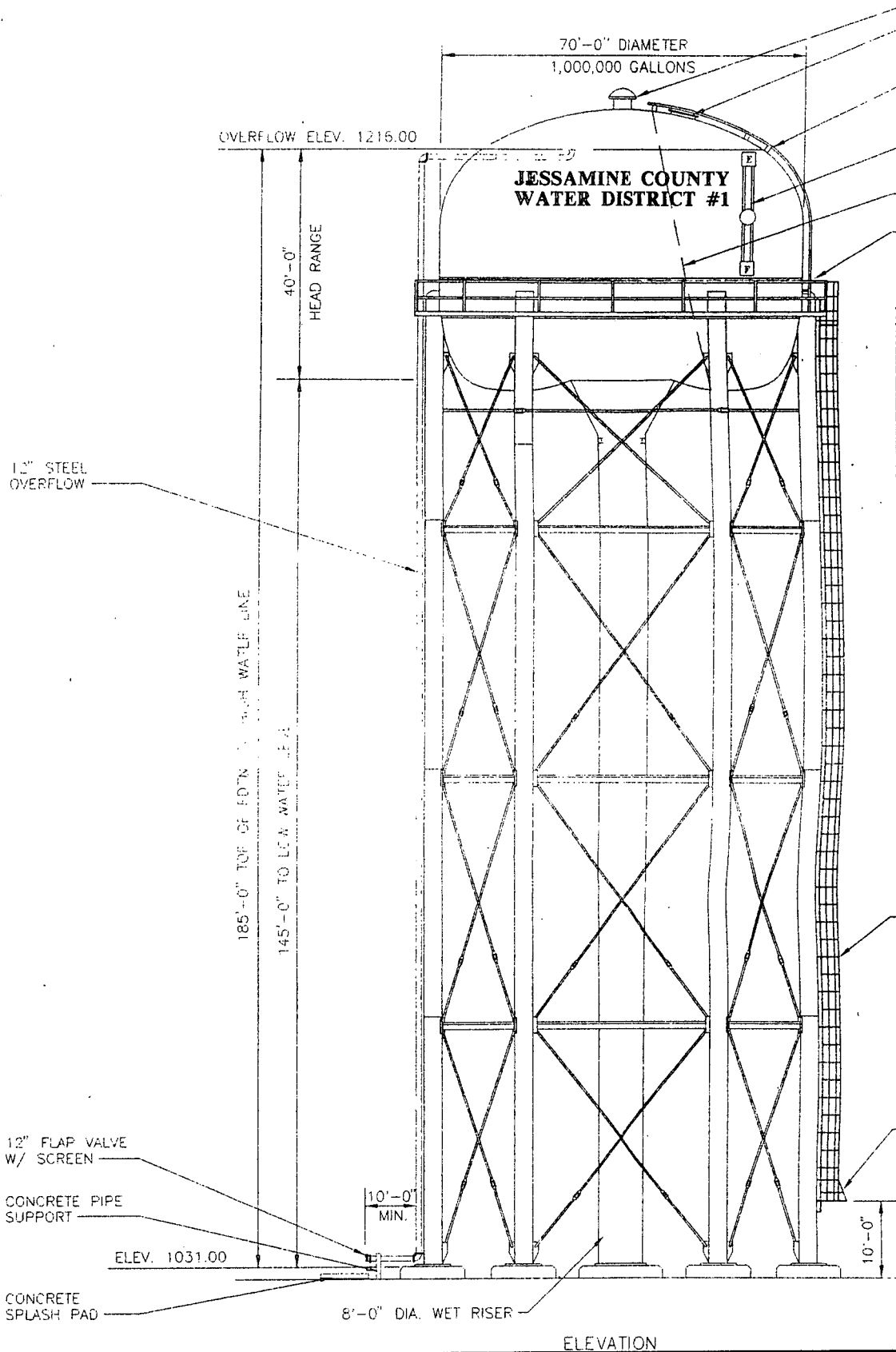
ELEVATION

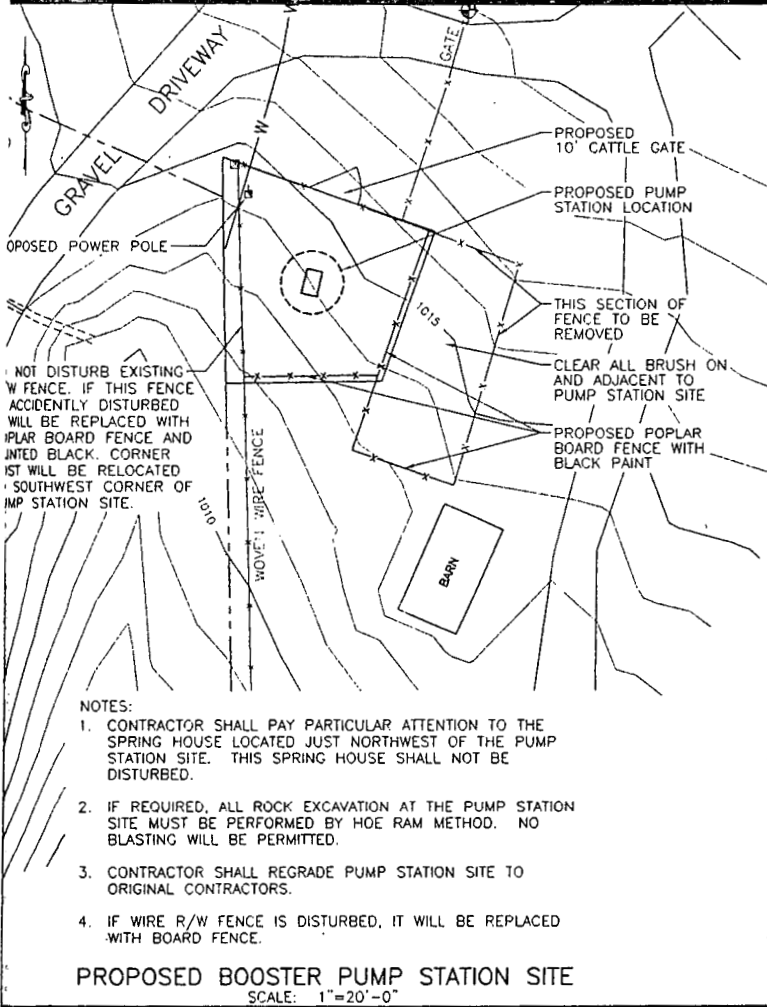
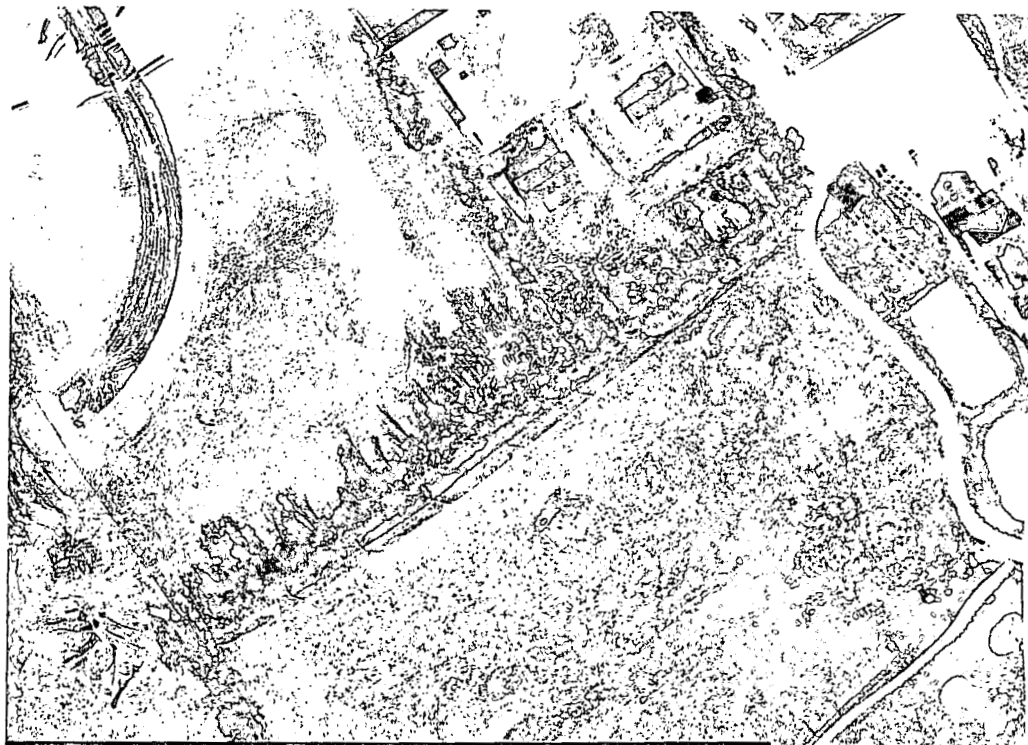
WATER STORAGE TANK ELEVATION

Not to Scale

NOTE: SEE SITE PLAN ON THIS SHEET FOR
TANK APPURTENANCE LOCATIONS.

| | | | | | | | | |
|-----|------|----------|--|--|--|----------------------------|--------|------|
| | | | | | | PROJECT 430.00 | | |
| | | | | | | SCALE: AS NOTED DATE: JUNE | | |
| | | | | | | DESIGNED BY | LWC/JR | |
| | | | | | | DRAWN BY | DDM | |
| | | | | | | CHECKED BY | REB | |
| | | | | | | RECORD DRAWINGS | | |
| NO. | DATE | REVISION | | | | CHK'D | APPR'D | DATE |





**JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY**

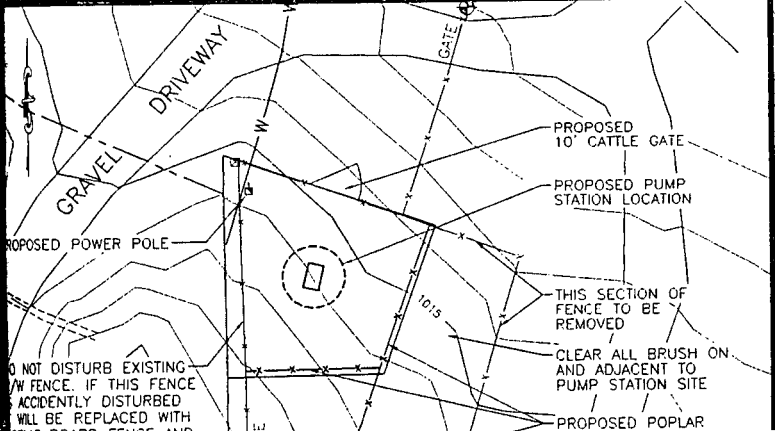
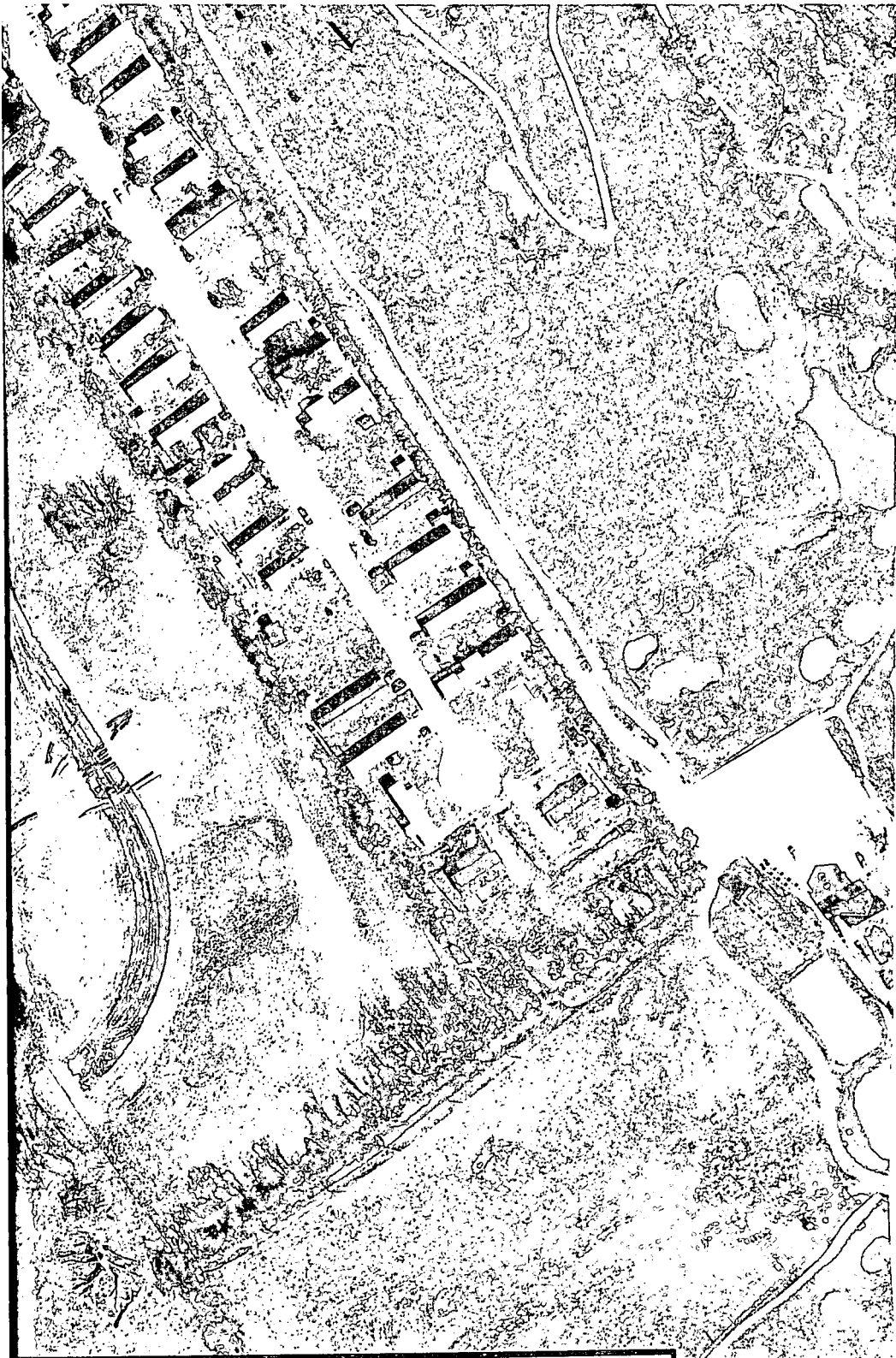
SHEET

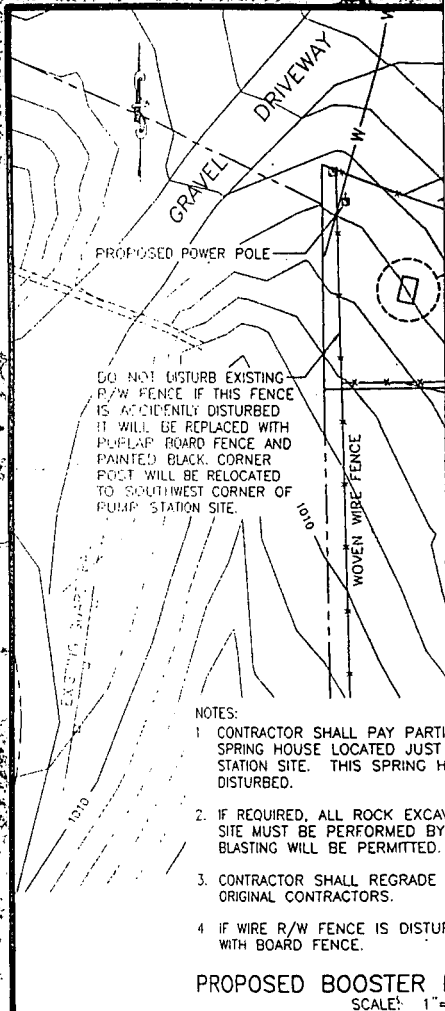
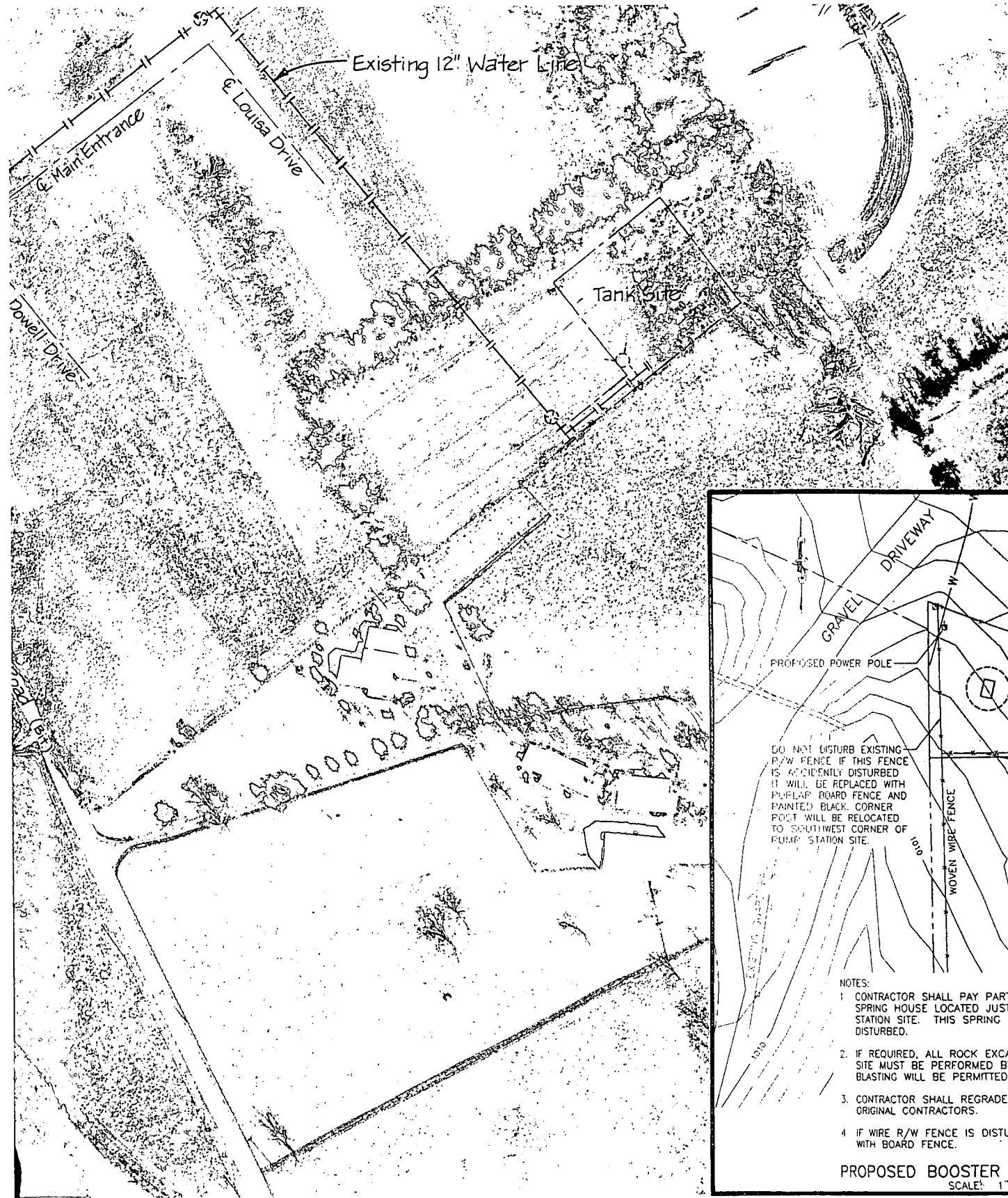
3

OF

7

BOOSTER PUMP STATION SITE LOCATION





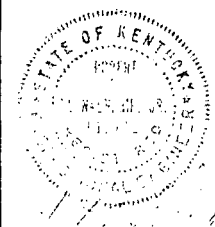
- NOTES:
1. CONTRACTOR SHALL PAY PARTIAL COST OF SPRING HOUSE LOCATED JUST EAST OF PUMP STATION SITE. THIS SPRING HOUSE WILL BE DISTURBED.
 2. IF REQUIRED, ALL ROCK EXCAVATION SITE MUST BE PERFORMED BY CONTRACTOR. BLASTING WILL BE PERMITTED.
 3. CONTRACTOR SHALL REGRADE TO ORIGINAL CONTOURS.
 4. IF WIRE R/W FENCE IS DISTURBED WITH BOARD FENCE.

PROPOSED BOOSTER PUMP
SCALE: 1" = 100'

Worth, Meyer & Boleyn, Inc.

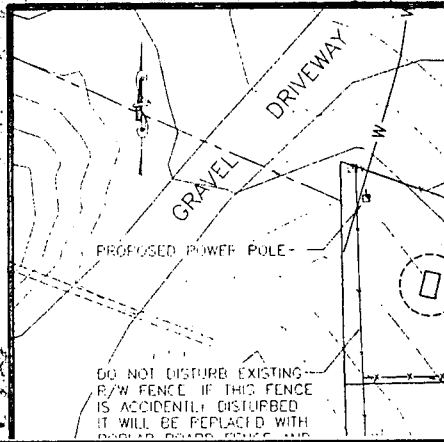
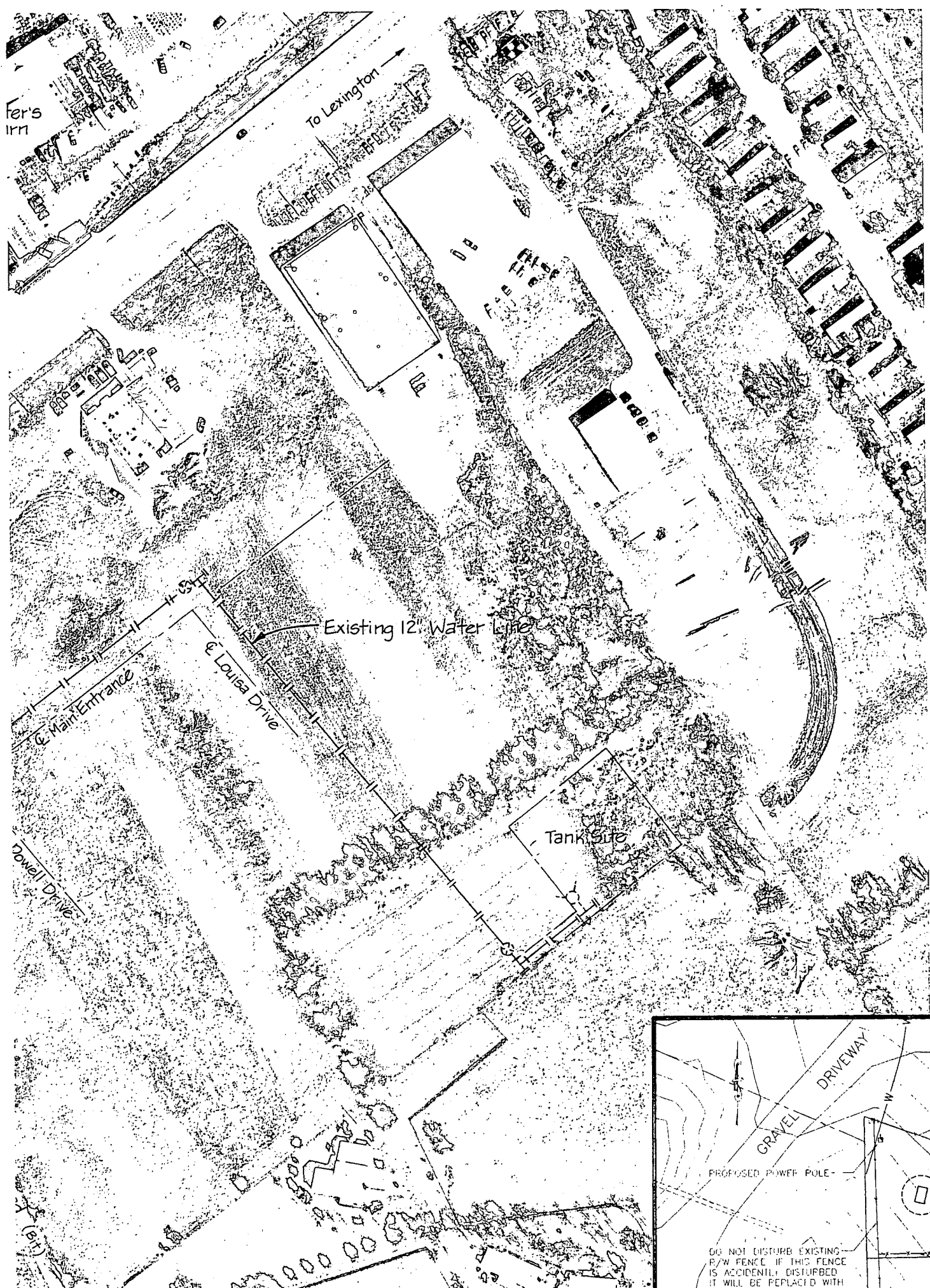
ENGINEERS • ARCHITECTS • PLANNERS

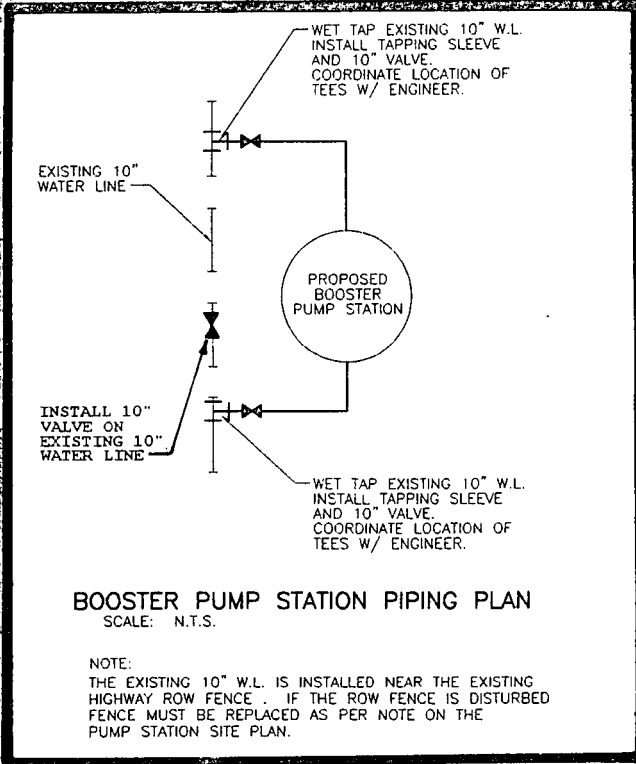
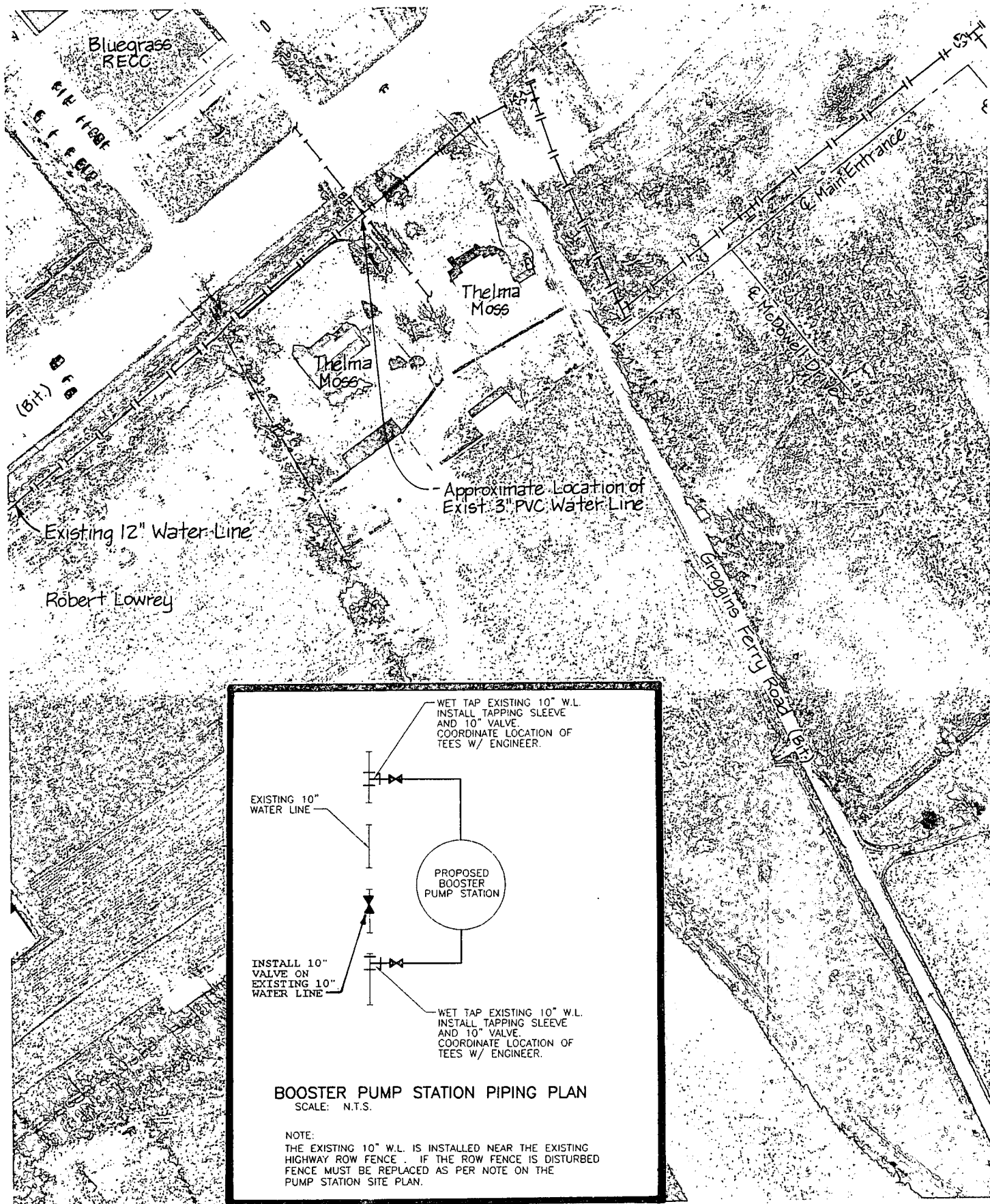
(502)695-9800
Fax (502)695-9810



JESSAMINE COUNTY
1,000,000 GALLO
AND
JESSAMINE COUNTY

BOOSTER PUMP





PROJECT: 430.00

SCALE: 1" = 100' DATE:

| | NAME | DATE |
|-----------------|------|------|
| DESIGNED BY | | |
| DRAWN BY | | |
| CHECKED BY | | |
| RECORD DRAWINGS | | |

HMB **Haworth, Meyer & E**
ENGINEERS • ARCHITECTS •

3 HMB Circle
Frankfort, Kentucky



Carpenter's Dish Barn

Bluegrass RECC

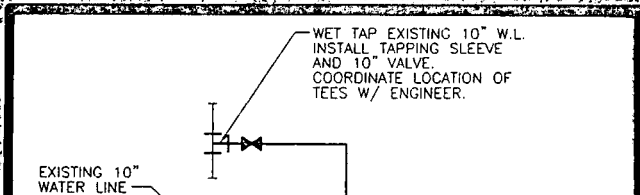
Theлма Moss

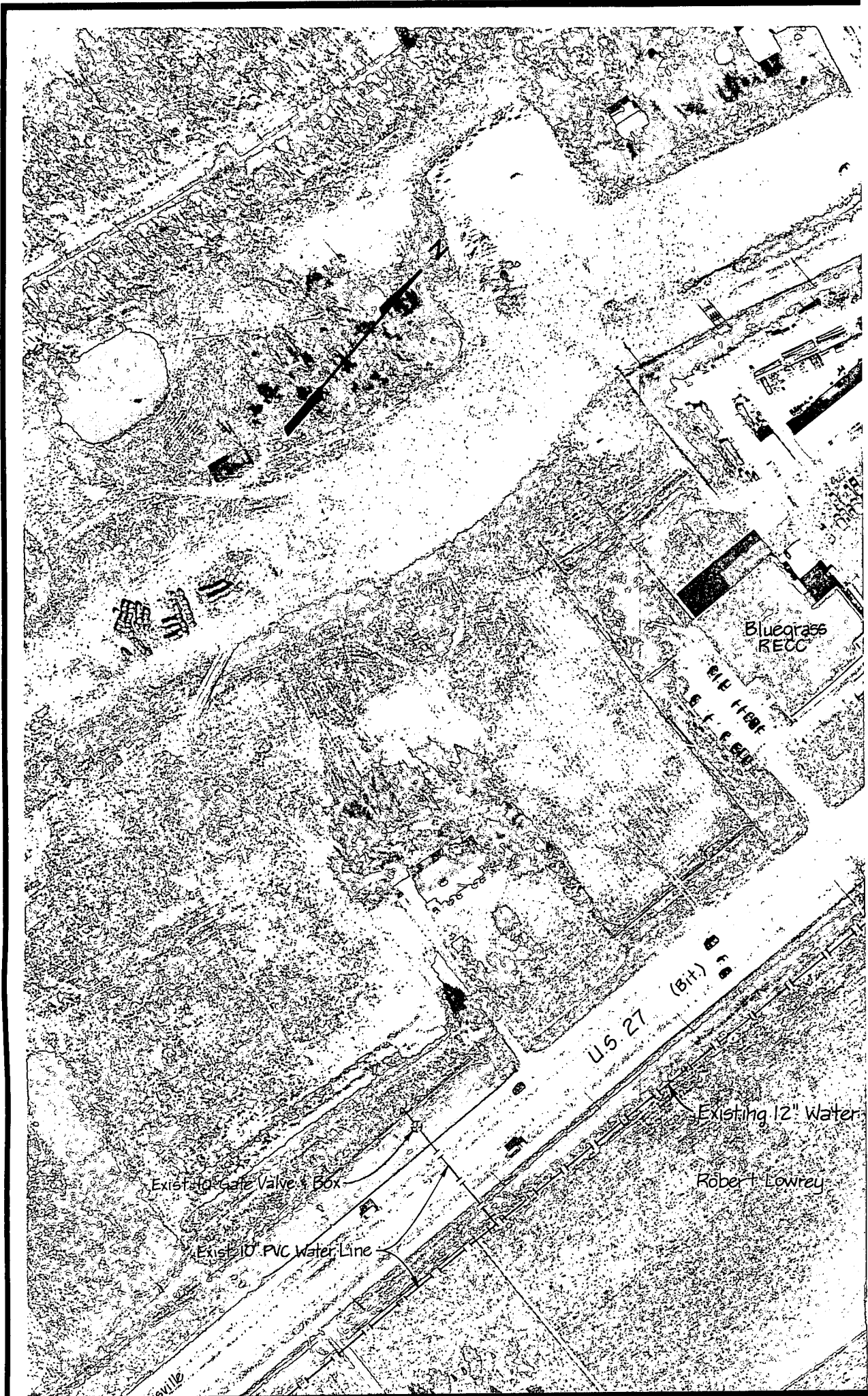
Theлма Moss

Approximate Location of Exist. 3" PVC Water Line

Existing 12" Water Line

Robert Lowrey





Bluegrass
RECC

U.S. 27
(61+)

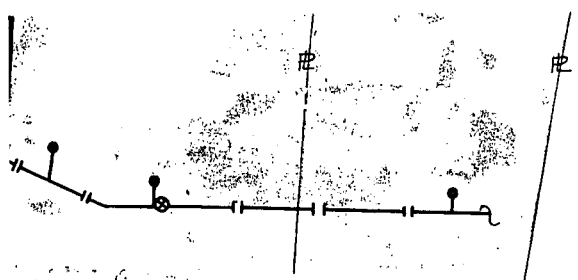
Existing 12" Water

Robert Lowrey

Exist. 10" Gate Valve & Box

Exist. 10" PVC Water Line

ville



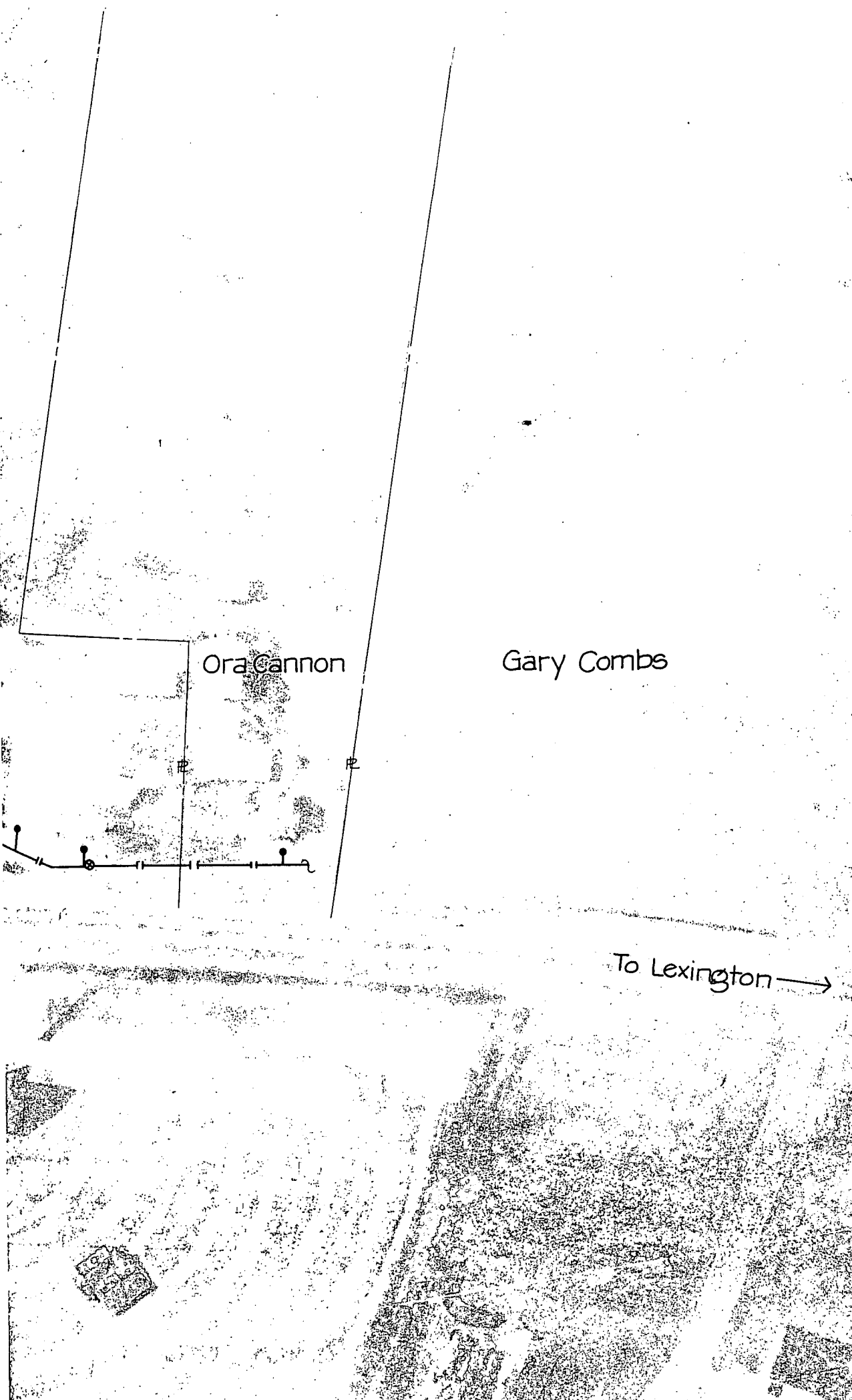
To Lexington →



Ora Cannon

Gary Combs

To Lexington →



Water Line

Ex. 6" Gate Valve

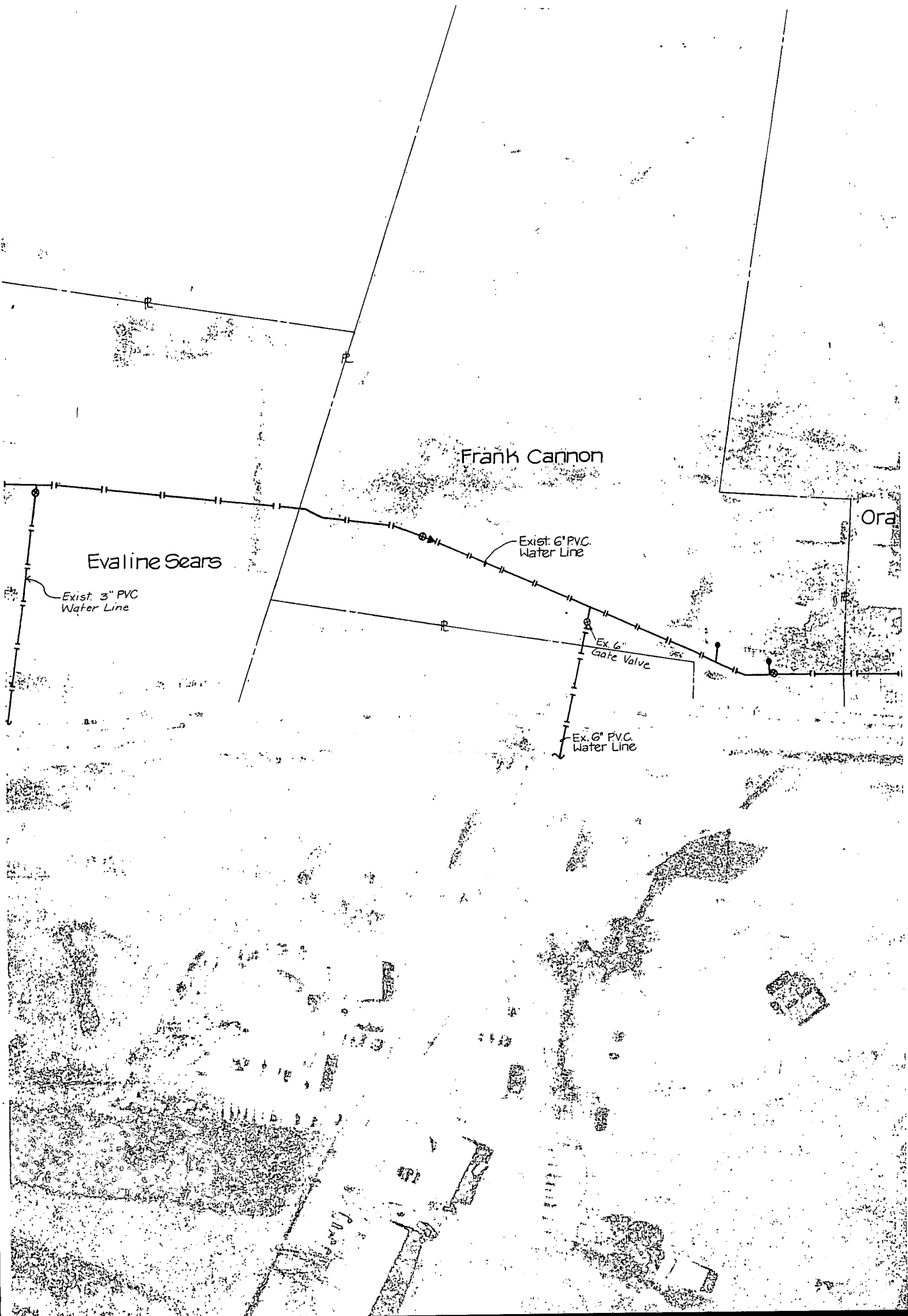
Ex. 6" PVC Water Line

JE
1,

Scale: 1"=1'

No. Da

| | |
|--|--------------|
| | JE 1, |
| | Scale: 1"=1' |
| | No. Da |
| | |



Frank Cannon

Ora

Evaline Sears

Exist. 3" PVC Water Line

Exist. 6" PVC Water Line

Ex. 6" Gate Valve

Ex. 6" PVC Water Line

Computrex
Assoc.

Computrex
Assoc.

Computrex
Assoc.

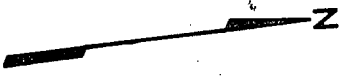
Bailey

Motel

Water Line

US 27





0/1/96

Computrex Assoc.

Computrex Assoc.

Computrex Assoc.

Computrex Assoc.

Mack W. Bailey

Motel

Evaline S

Exist. 3" PVC Water Line

US 27



CATNIP HILL ROAD

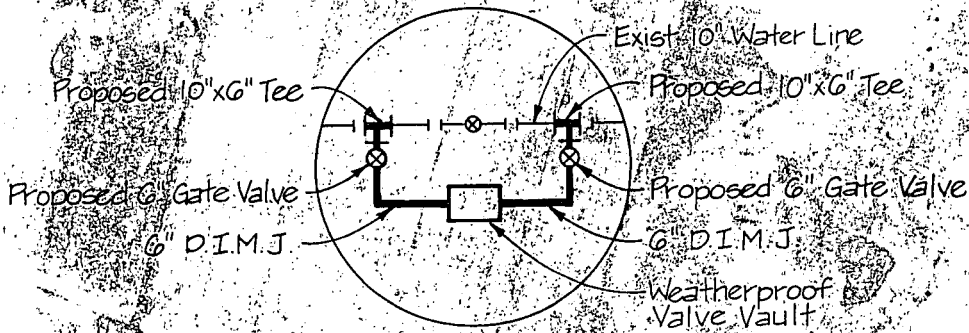
M & H Investments

Kai Chan

Computrex Assoc.

CC

← To Nicholasville



Note: Contractor is responsible for wiring from the Proposed RTU located at the Existing Pump Station Site to the Flow Control Valve.
See Notes on Detail Sheet 7

Wansink

Haddad, Inc.
(Radi Haddad 10/1/96)

Exist. Pump Station

Exist. 10" Water Line

Proposed (2) 10" x 6" Tees

Exist. 10" Gate Valve

Daniel C. Hiler
Deborah C. Hiler (Wf.)

See Detail
this Sheet

Exist. 10" Water Line

PROPOSED FLOW CONTROL
VALVE LOCATION

Superior
Datson

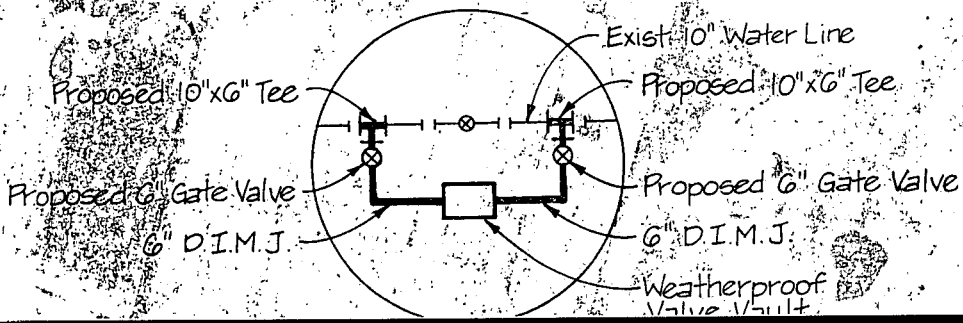
CATNIP HILL ROAD

Shung
Kai Chan

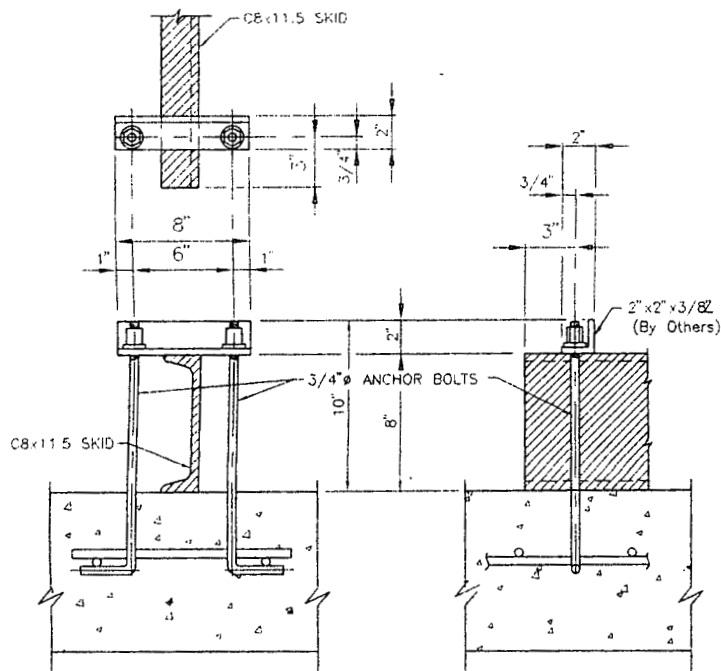
Computrex
Assoc.

M & H Investments

← To Nicholasville



LAP JOINT CONNECTION
OF CAPSULE WALL PLATE
WITH FLANGE TOP AND BOTTOM



TYPICAL ANCHOR DETAIL

NOTE: ANCHOR CLIPS FURNISHED BY E.F.I.
STAINLESS STEEL ANCHOR BOLTS
& NUTS BY INSTALLER

DESIGN CRITERIA

Controls TELEMETRY

Power Service: 230 Volts, 3 Phase, 60 Cycle

PUMP DATA

Type: HORIZ., CLOSE CPLD., END SUCTION

Pump 1 & 2

Capacity: 350 G.P.M. AT 80 FEET T.D.H.

Size: 4" X 3" X 7"

Motor: 15 H.P., 3500 R.P.M.

NOTE: FCA - FLANGED COUPLING ADAPTER
EPC - ELASTOMER PIPE CONNECTOR

JESSAMINE COUNTY WATER DISTRICT #1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY

SHEET

5

OF

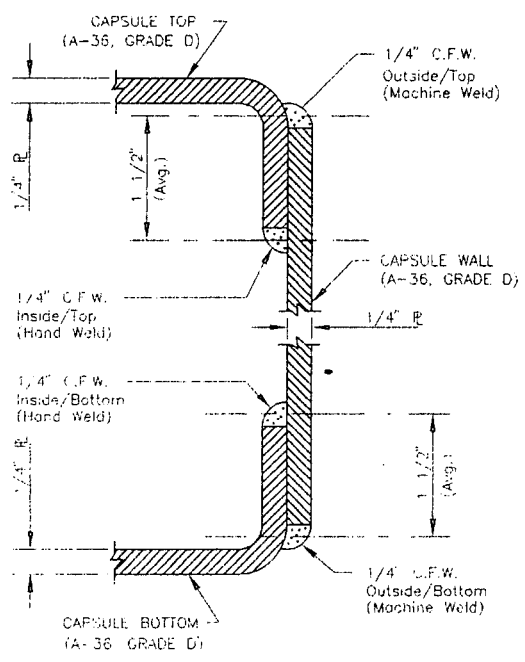
7

BOOSTER PUMP STATION DETAILS

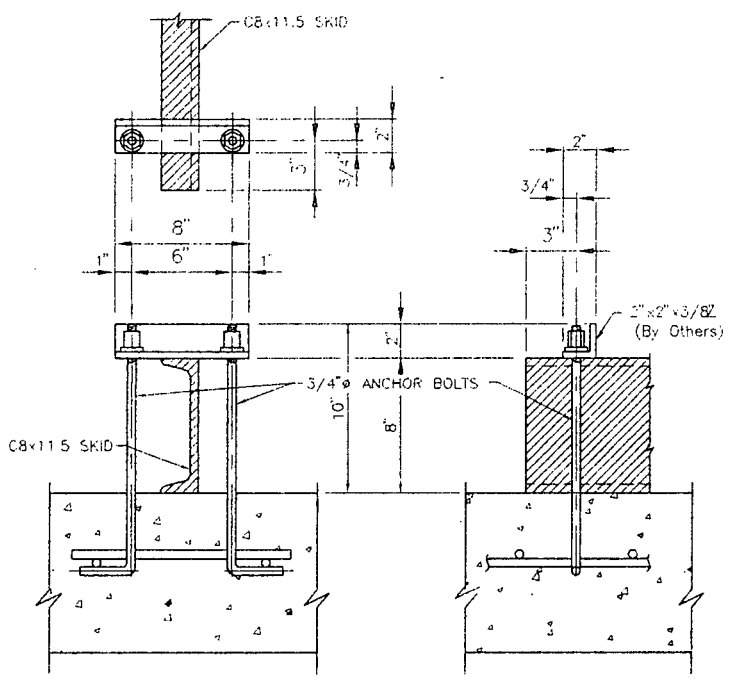


10" MAIN
OUTLET

3'-8"



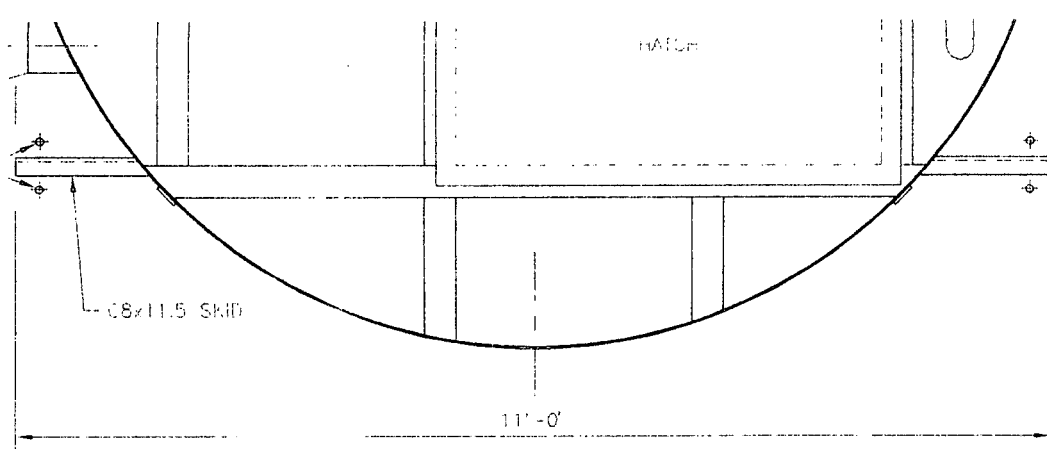
LAP JOINT CONNECTION
OF CAPSULE WALL PLATE
WITH FLANGE TOP AND BOTTOM



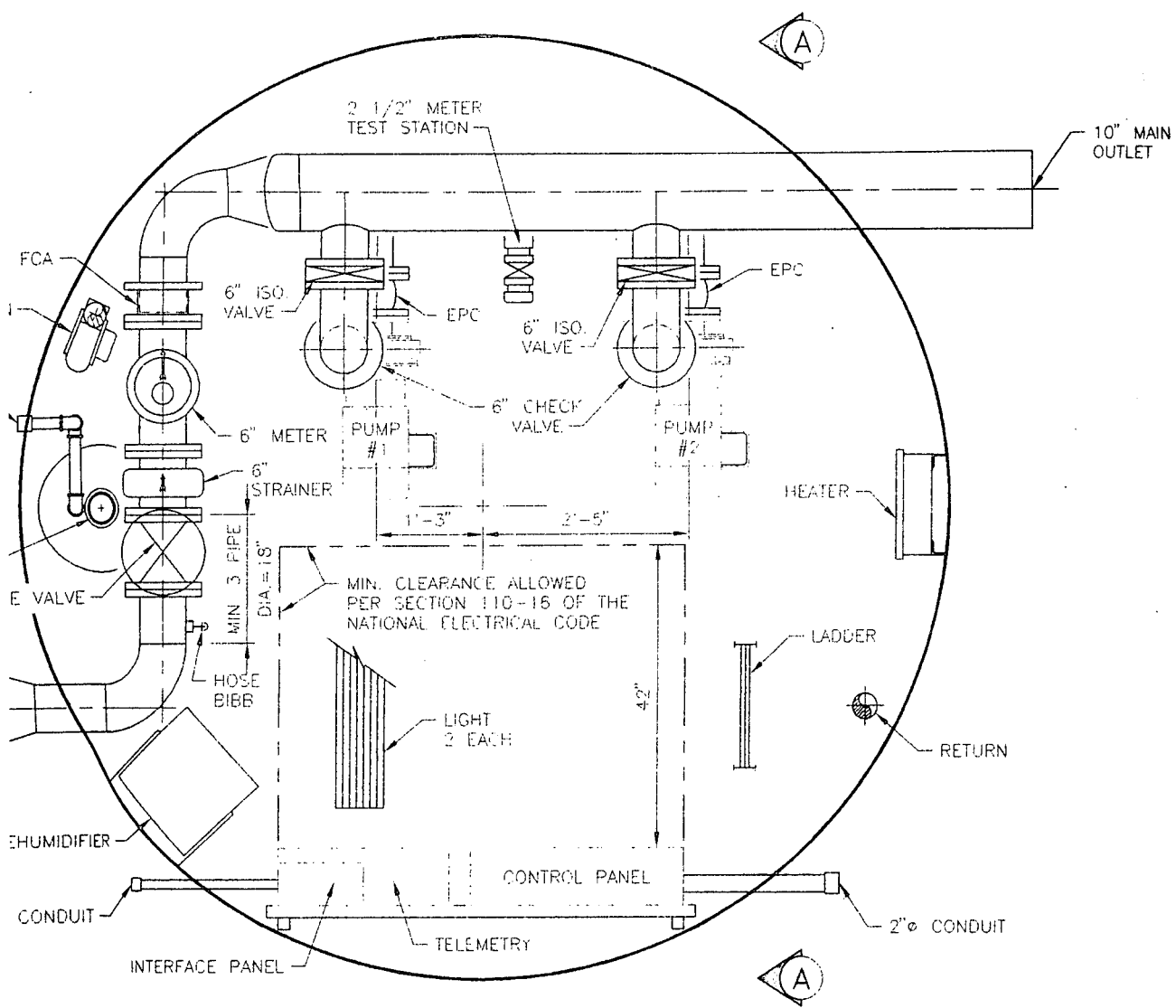
10" MAIN
OUTLET

TYPICAL ANCHOR DETAIL

NOTE: ANCHOR CLIPS FURNISHED BY E.F.I.
STAINLESS STEEL ANCHOR BOLTS
& NUTS BY INSTALLER



EXTERIOR PLAN

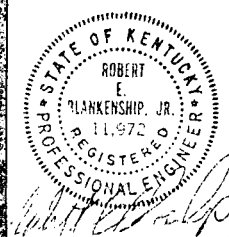


INTERIOR PLAN

Jaworth, Meyer & Boleyn, Inc.

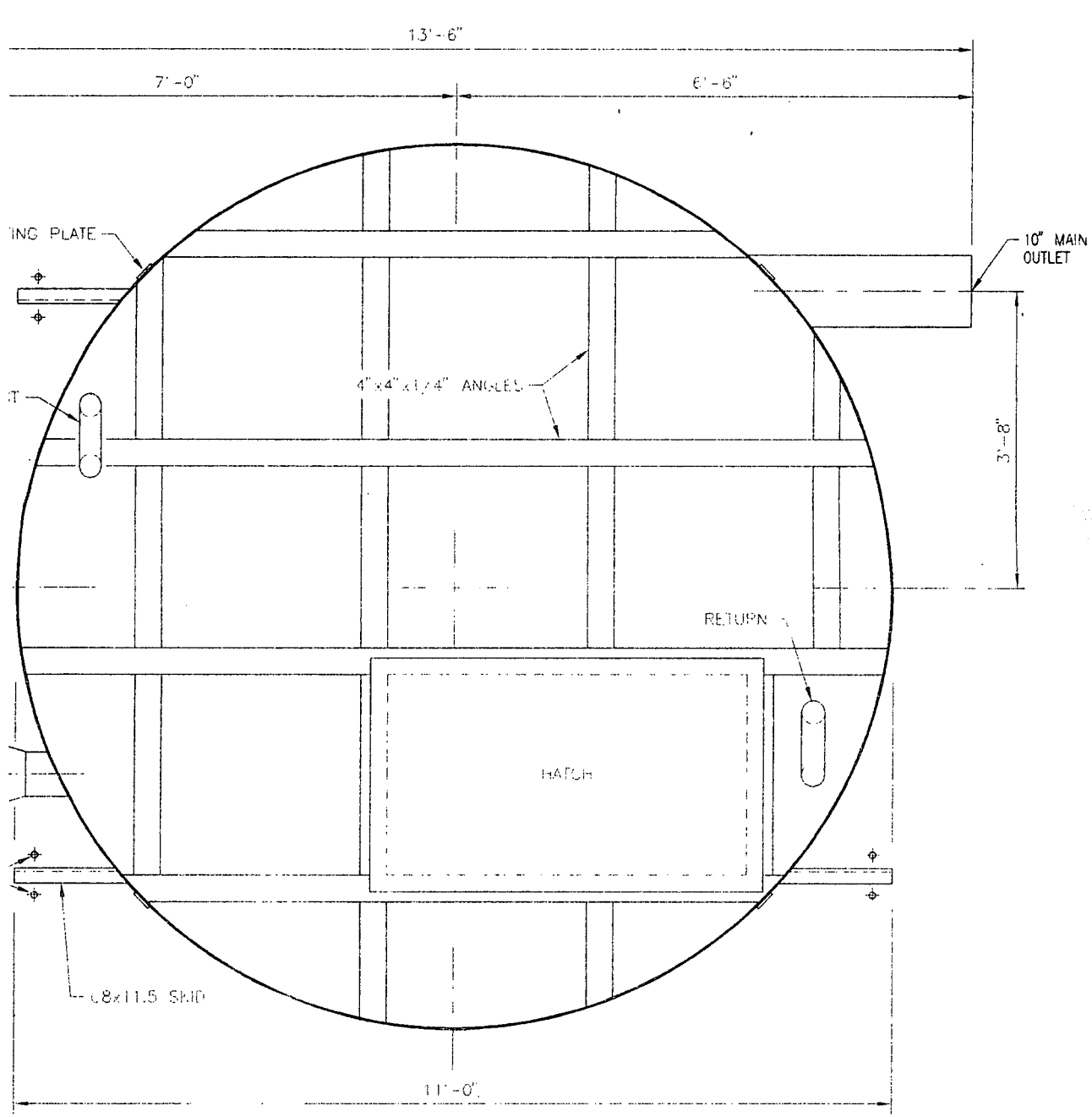
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Fax (502)695-9810

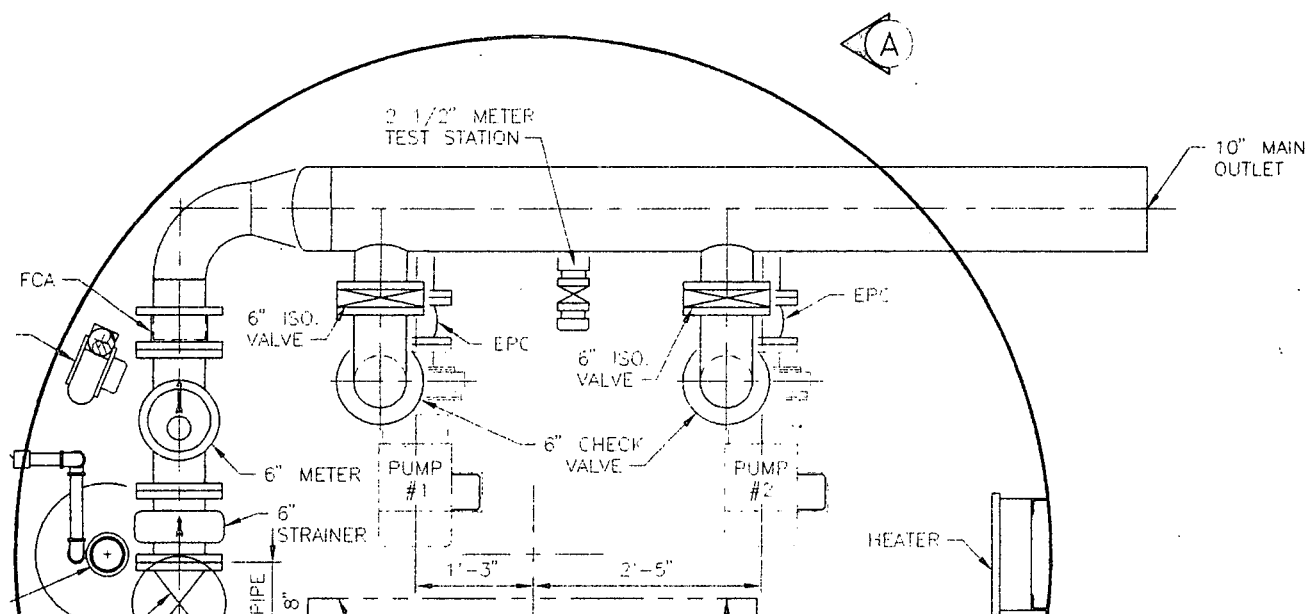


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1,000,000 GAL
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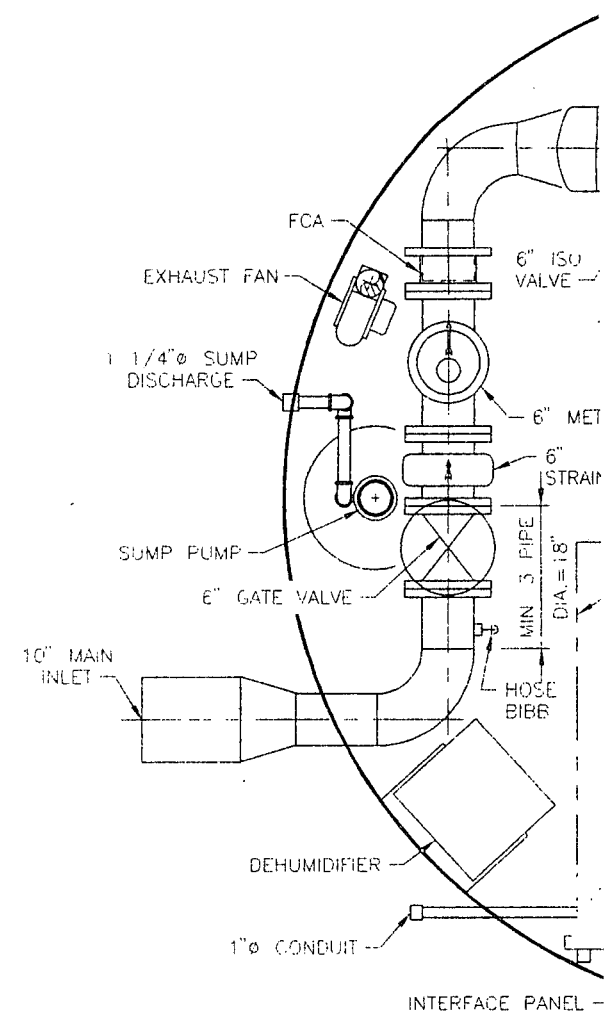
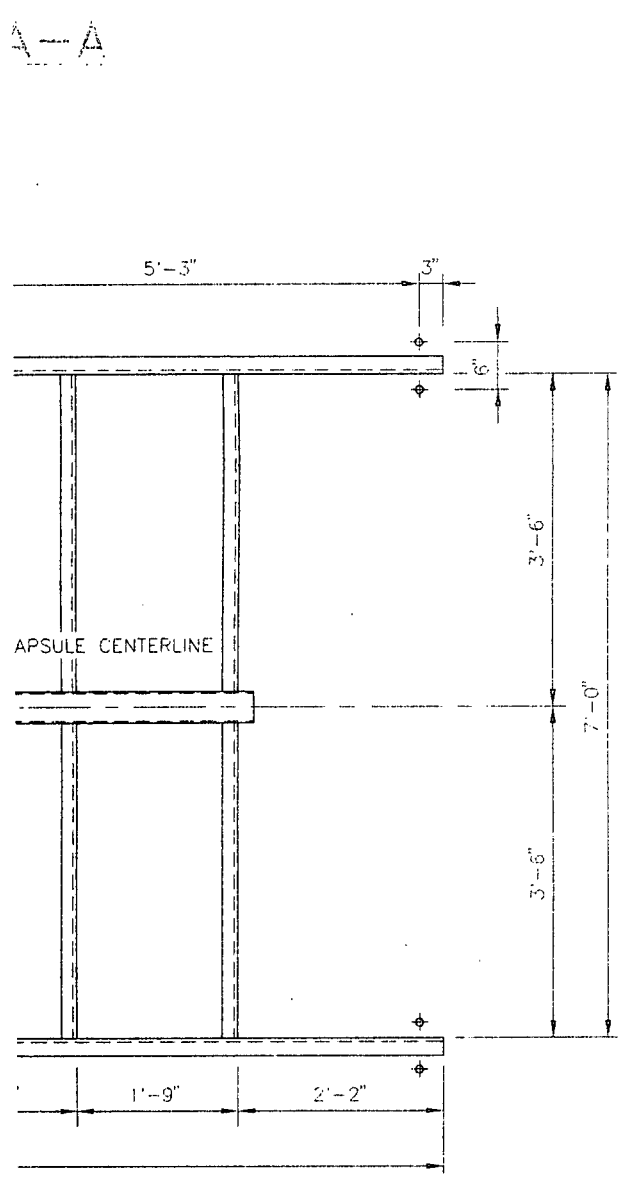
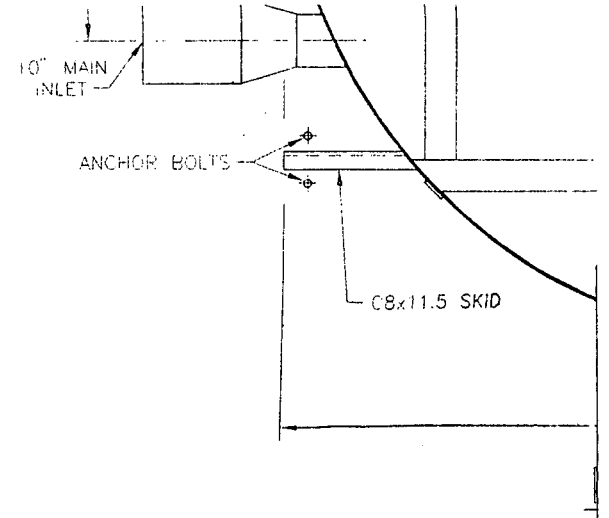
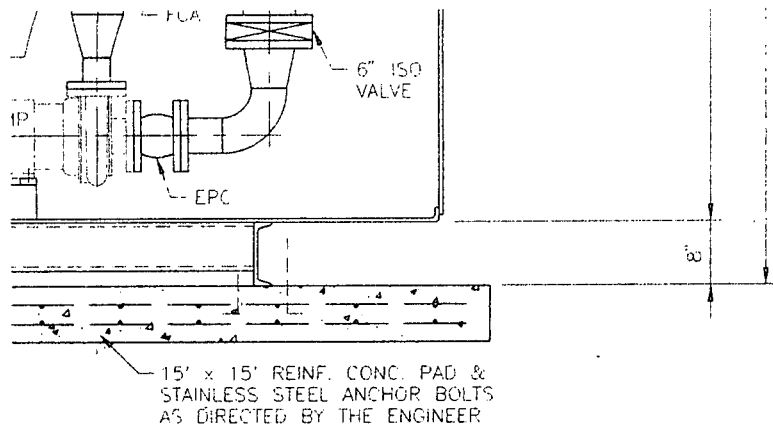
BOOST



EXTERIOR PLAN



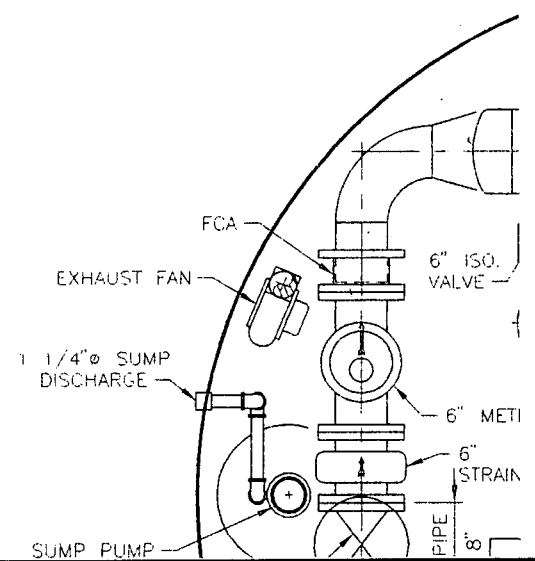
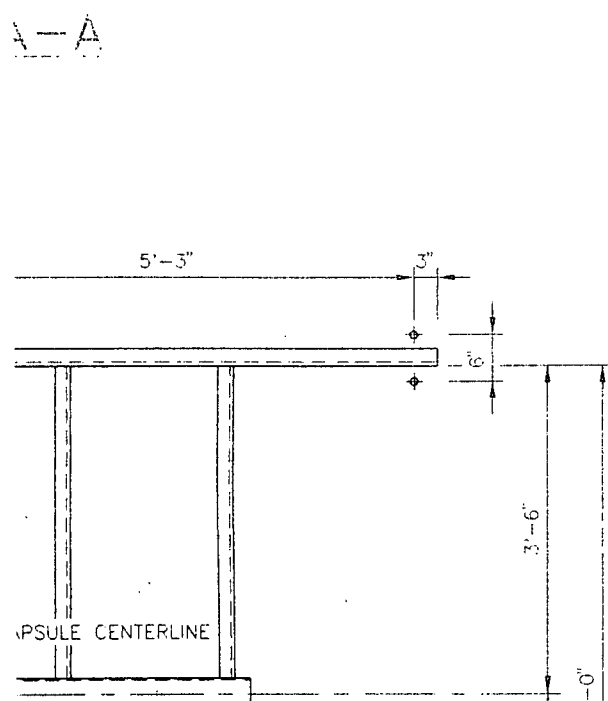
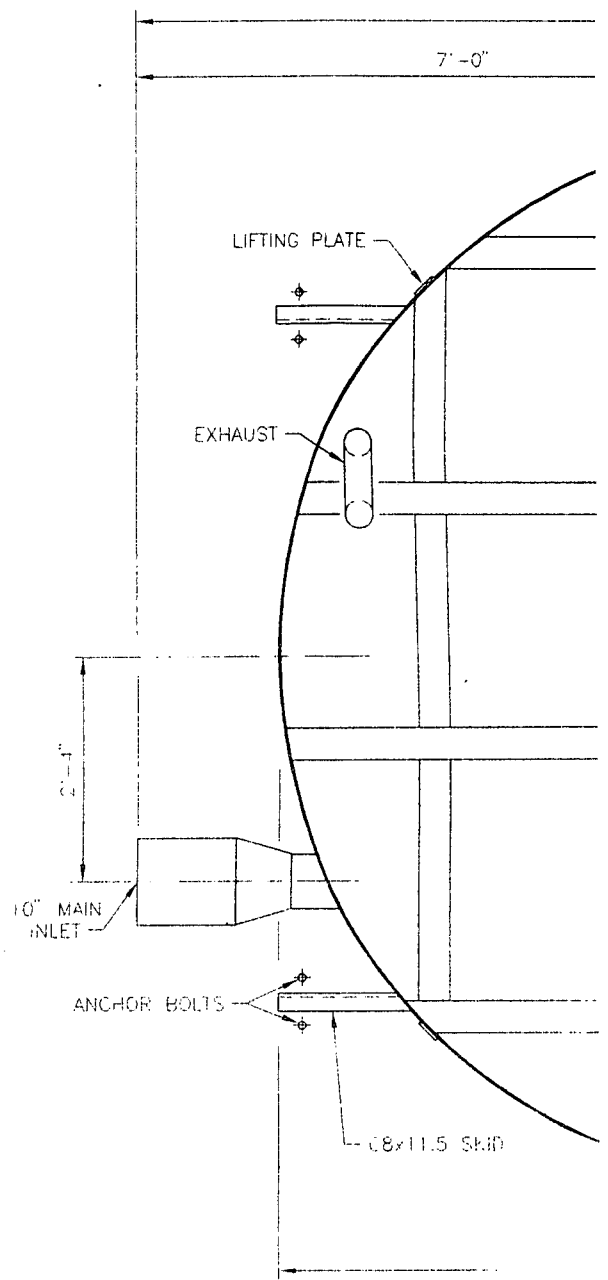
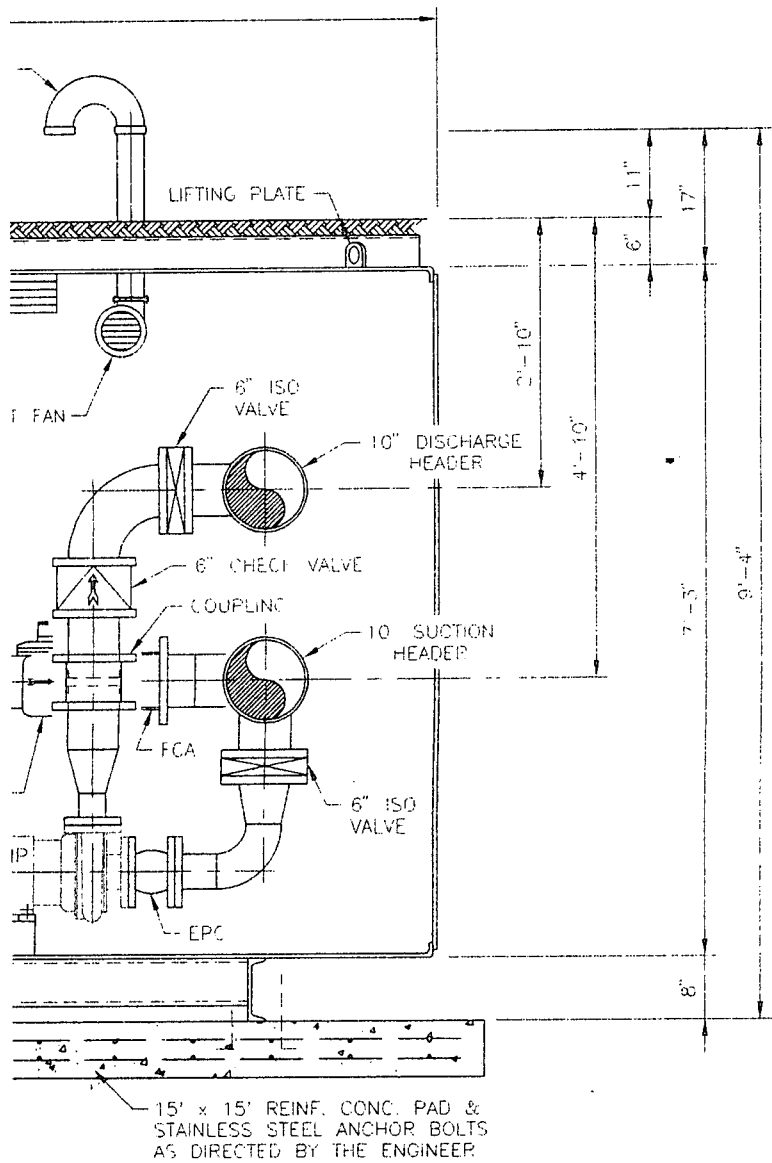
C8x1

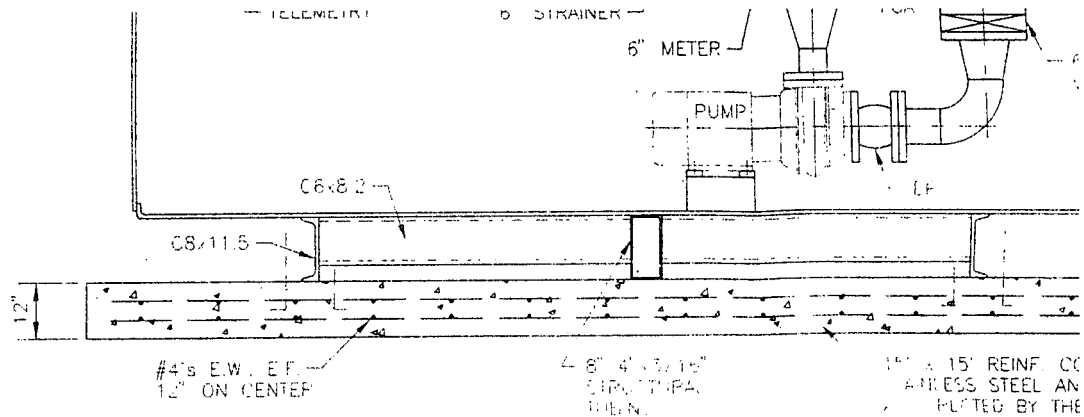


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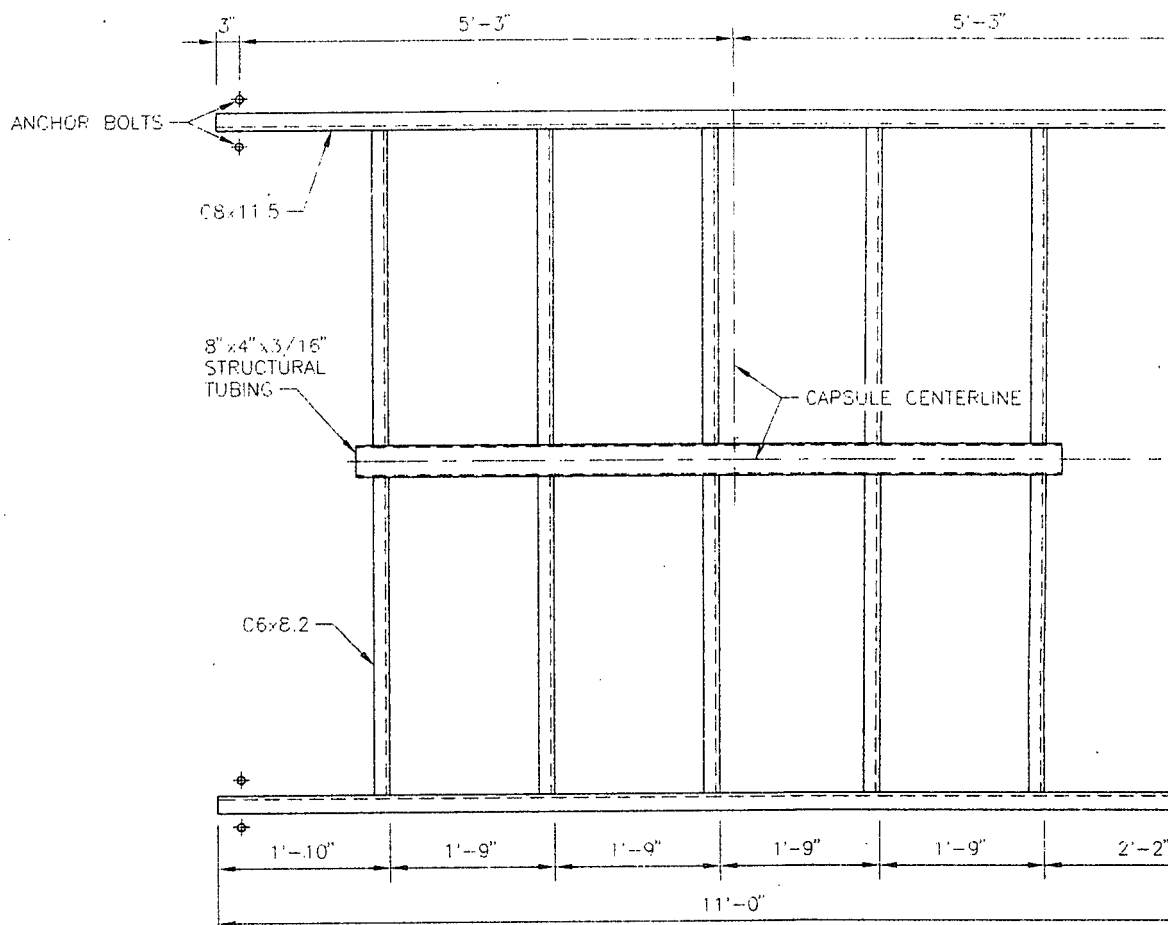
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|-------------------------------------|------|------|
| PROJECT: 430.00 | | |
| SCALE: 3/4" = 1'-0" DATE: JUNE 1998 | | |
| DESIGNED BY | NAME | DATE |
| DRAWN BY | LWC | |
| CHECKED BY | GAR | |
| RECORD DRAWINGS | REB | |


Haworth, Meyer &
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 Frankfort, Kentucky



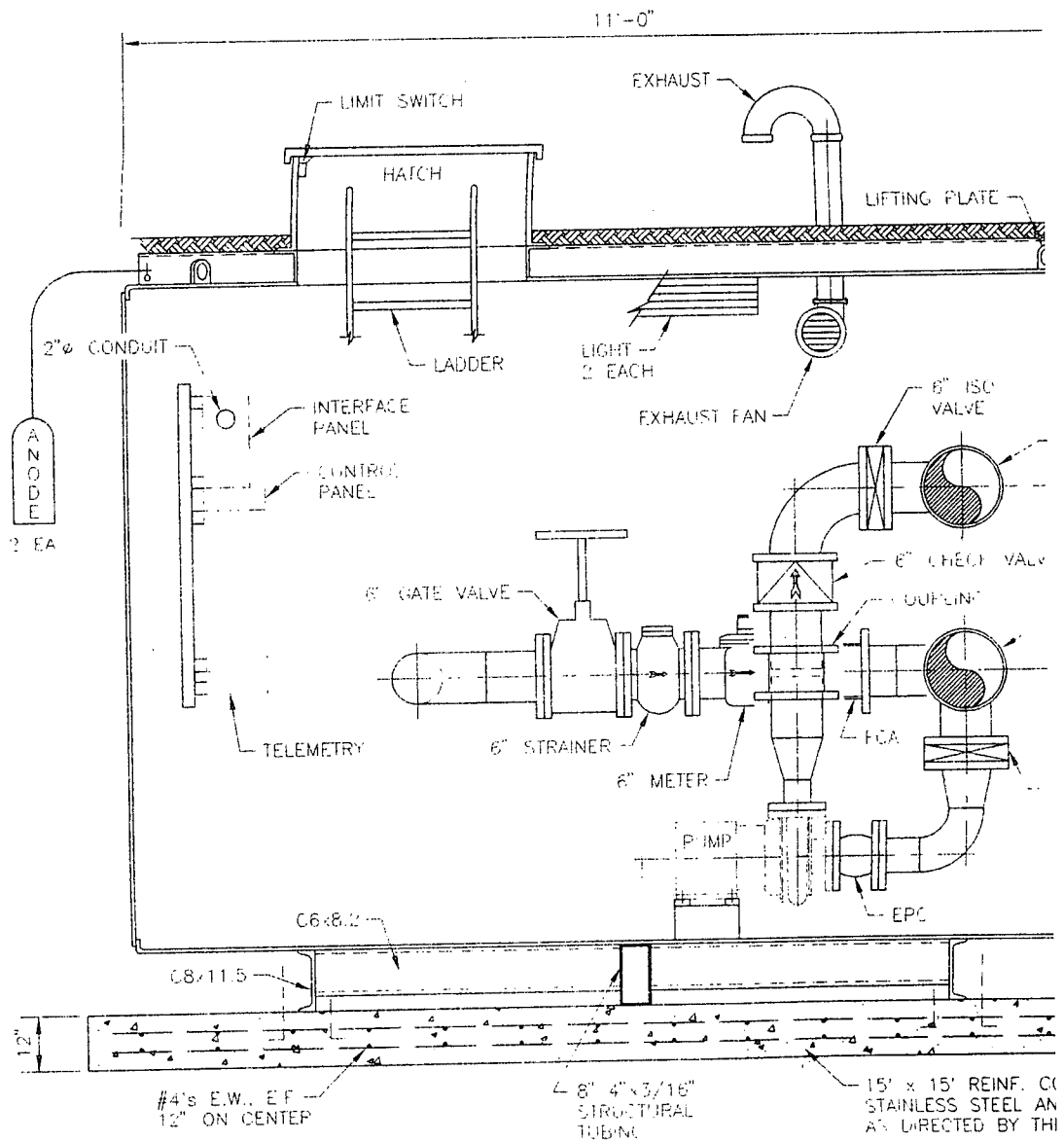


5'-0"

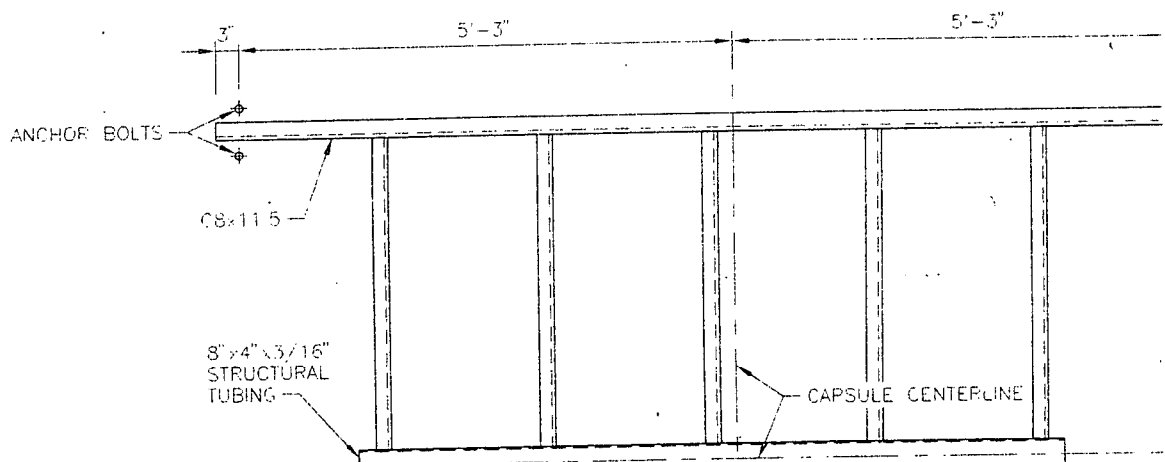


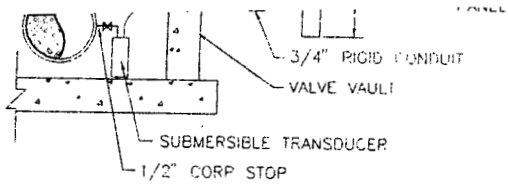
SKID PLAN

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|-----|------|----------|-------|--------|------|---------------------------------|-----|
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| | | | | | | DESIGNED BY | LWC |
| | | | | | | DRAWN BY | GAR |
| | | | | | | CHECKED BY | REB |
| | | | | | | RECORD DRAWINGS | |
| NO. | DATE | REVISION | CHK'D | APPR'D | DATE | | |



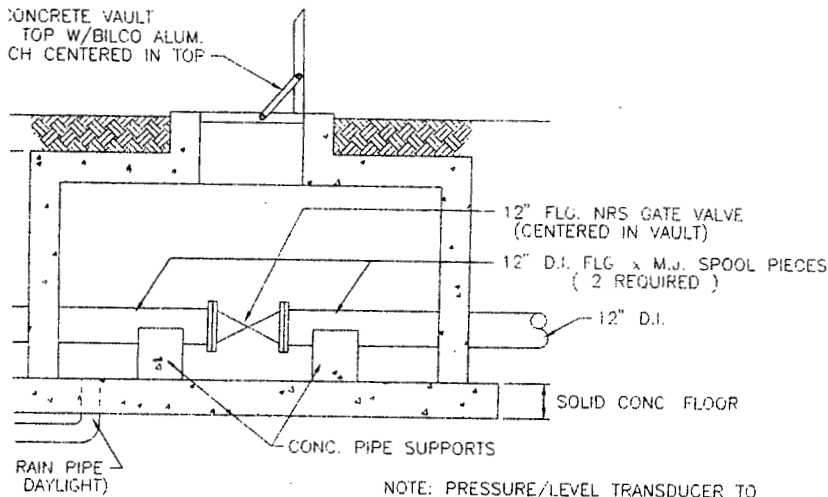
SECTION A-A





DETAIL - TANK TRANSDUCER

N.T.S.

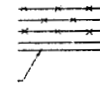


NOTE: PRESSURE/LEVEL TRANSDUCER TO
BE LOCATED IN CONCRETE VAULT
SEE DETAIL THIS SHEET.

NOTE: FOR SITE LOCATION SEE SHEET 2.

DETAIL - TANK VALVE VAULT

N.T.S.



1/8" O.D.
1" CM RAIL



CL

10' MAX

CHAIN L

N.T.S.

JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY

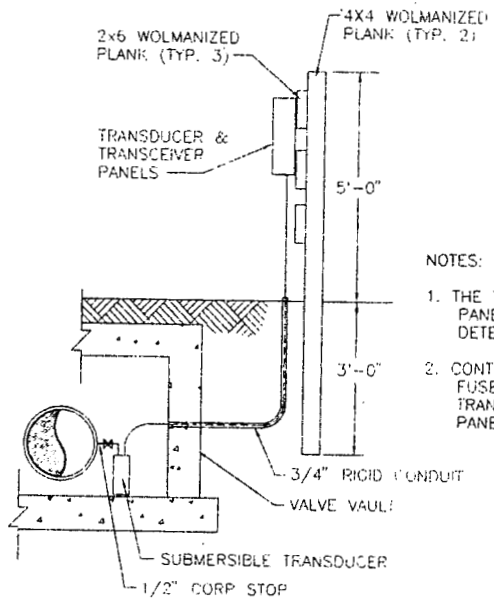
SHEET

6

OF

7

WATER STORAGE TANK DETAILS



CONTRACTOR)

NOTES:

1. THE TRANSDUCER AND TRANSCIEVER PANEL LOCATION IS TO BE FIELD DETERMINED
2. CONTRACTOR TO PROVIDE A 20 AMP FUSED DISCONNECT AT THE TRANSDUCER AND TRANSCIEVER PANEL

DETAIL - TANK TRANSDUCER

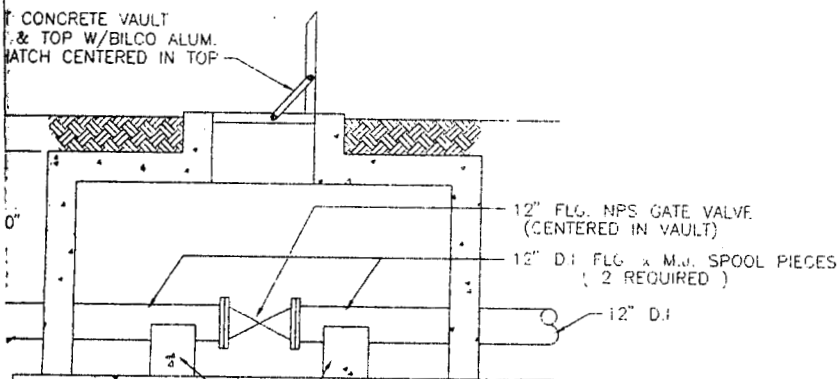
N.T.S.

STEEL

D.I

CK W/
BE PO
INSTALL

CONCRETE VAULT
& TOP W/BILCO ALUM.
MATCH CENTERED IN TOP



EU

ELECTRICAL

UNDERGROUND 3/4" RIGID CONDUIT SERVICE TO TANK OR PUMP STATION

CONDUIT FOR TELEMETERING CABLE-ANTENNA TO PUMP STATION

AT PUMP STATION ANTENNA ON POLE BY CONTRACTOR

AT TANK ANTENNA MOUNTED ON TANK

DETAIL - POWER POLE

N.T.S

NOTE: POWER POLE REQUIRED AT THE NEW TANK AND NEW PUMP STATION ONLY CONTRACTOR CAN UTILIZE EXISTING POWER POLES AT EXISTING TANK AND EXISTING PUMP STATION.

DE

PRE-CAST CONCRETE VAULT (5'x4'x5') & TOP W/BILCO ALUM. ACCESS HATCH CENTERED IN TOP

NOTE: FOR SI

WATER FENCE

DETAIL -

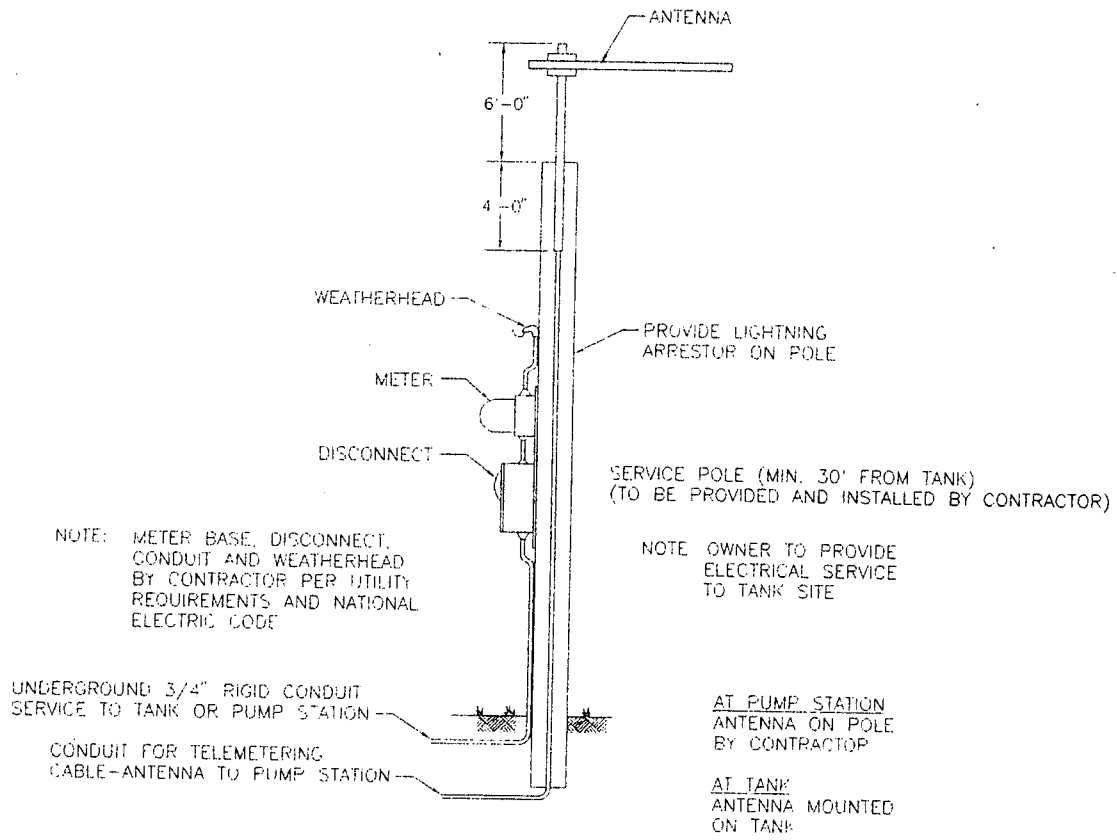
North, Meyer & Boleyn, Inc.

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Fax (502)695-9810

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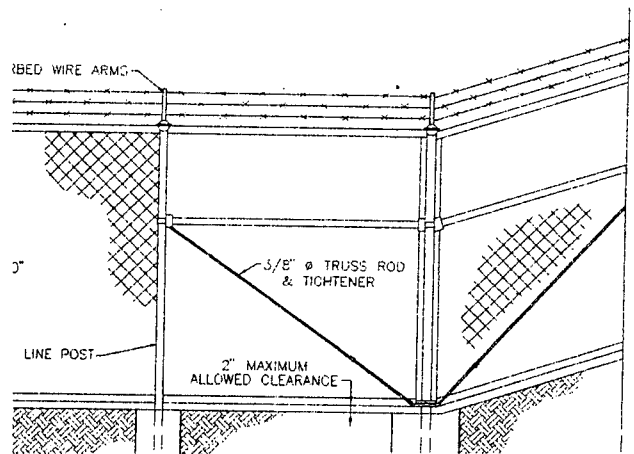
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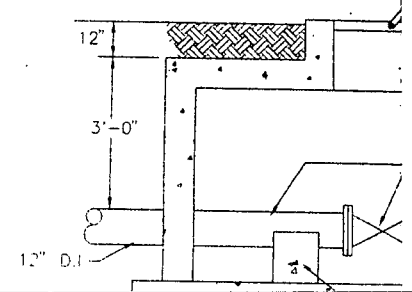
DETAIL -- POWER POLE

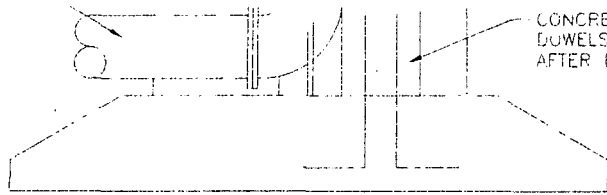
N.T.S.

NOTE: POWER POLE REQUIRED AT THE NEW TANK AND NEW PUMP STATION ONLY CONTRACTOR CAN UTILIZE EXISTING POWER POLES AT EXISTING TANK AND EXISTING PUMP STATION



PRE-CAST CONCRETE VAULT (5'x4'x5') & TOP W/BILCO ALUM. ACCESS HATCH CENTERED IN TOP





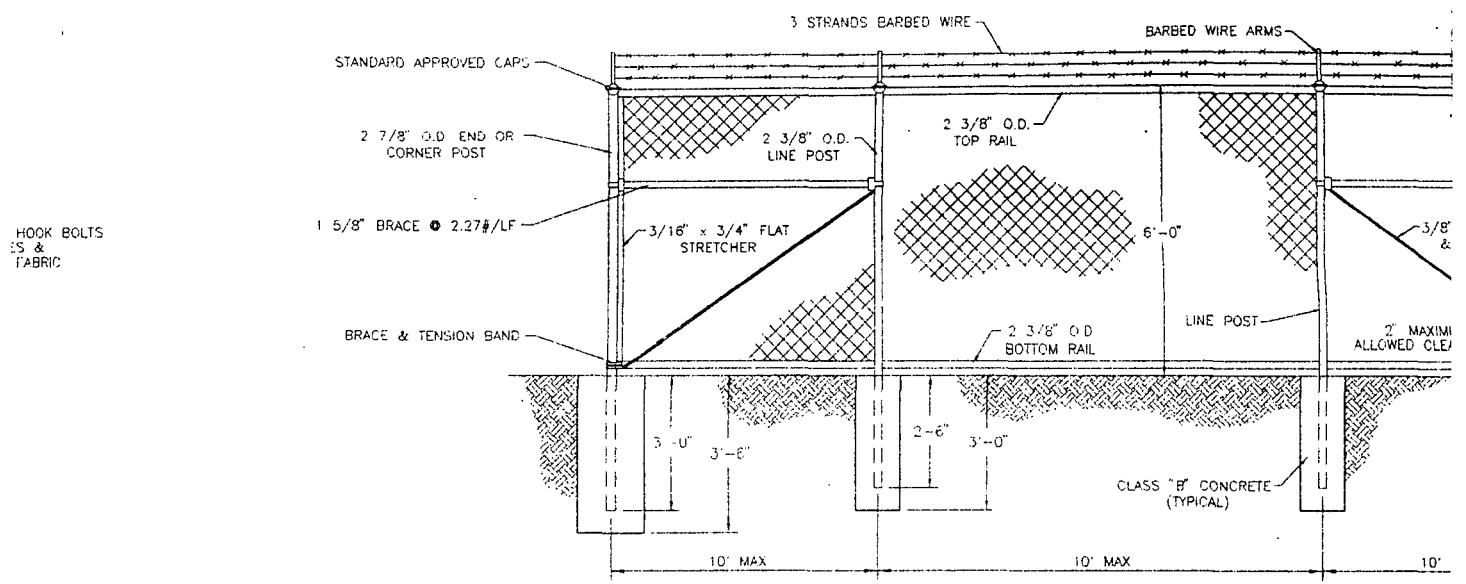
CONCRETE THRUST BLOCK W/#4
DOWELS AT 6" O.C. TO BE POURED
AFTER BASE ELBOW IS INSTALLED.

UNDERGR
SERVICE 1

COND
CABLE

DETAIL -- INLET/OUTLET

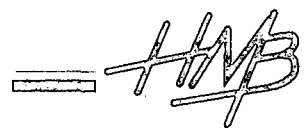
N.T.S.



DETAIL -- CHAIN LINK FENCE

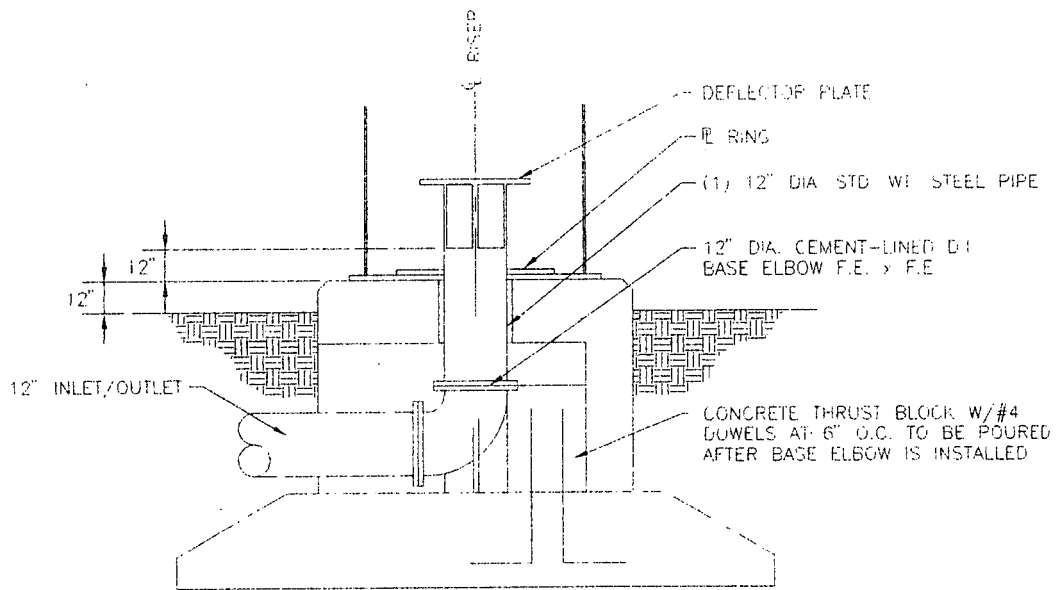
N.T.S.

| | |
|-----------------|-----------|
| PROJECT | 430.00 |
| SCALE | N.T.S. |
| DATE | JUNE 1998 |
| DESIGNED BY | JDP 5/98 |
| DRAWN BY | GAR 5/98 |
| CHECKED BY | REB 5/98 |
| RECORD DRAWINGS | |



Haworth, Meyer &
ENGINEERS • ARCHITECT

3 HMB Circle
Frankfort, Kentucky



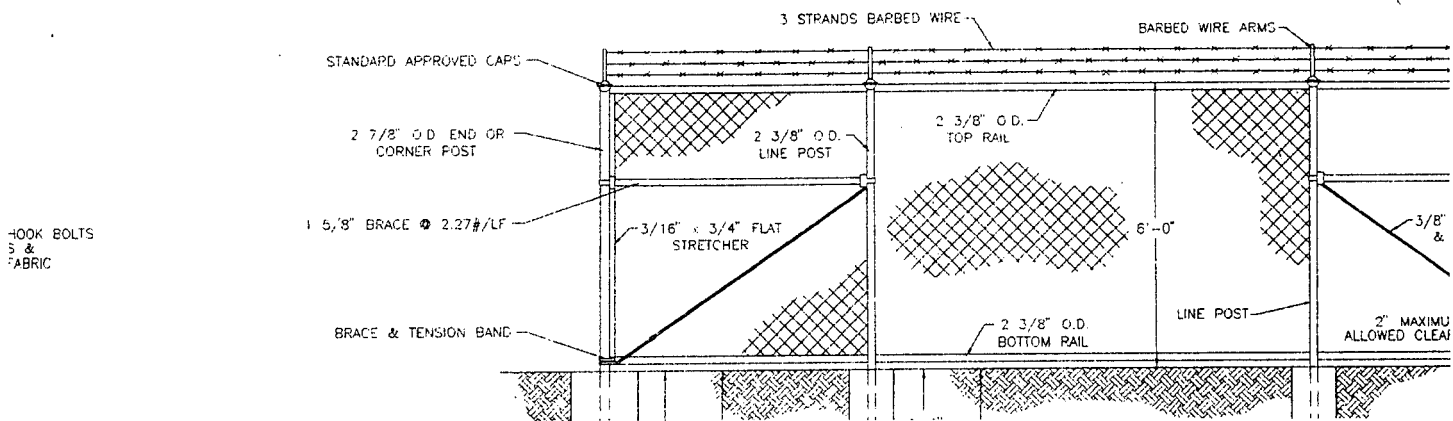
NOTE:

UNDERGR
SERVICE T

CONDL
CABLE

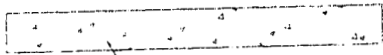
DETAIL - INLET/OUTLET

N.T.S.



HOO
BOLTS
&
FABR

2\"/>

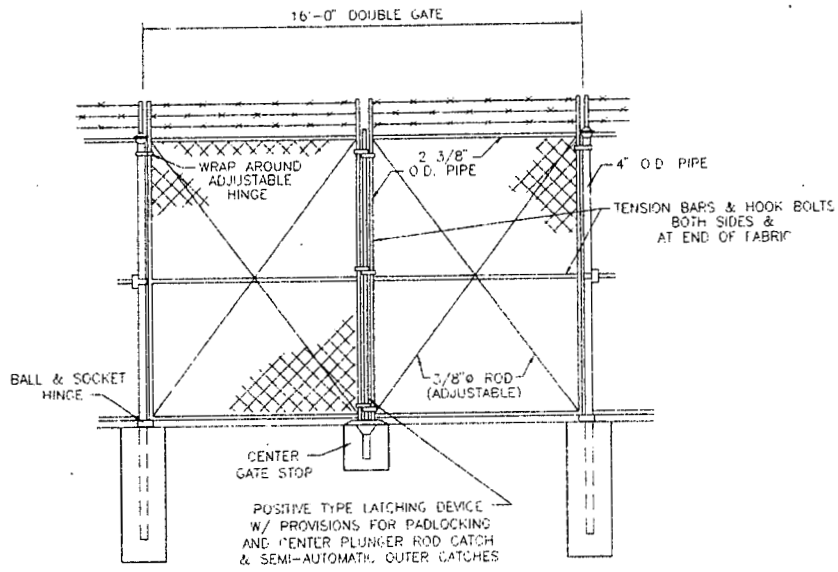


4x6 CONCR SPLASH FACE

1/2" STEEL PIPE

DETAIL -- FLAP GATE

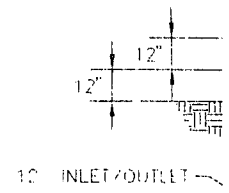
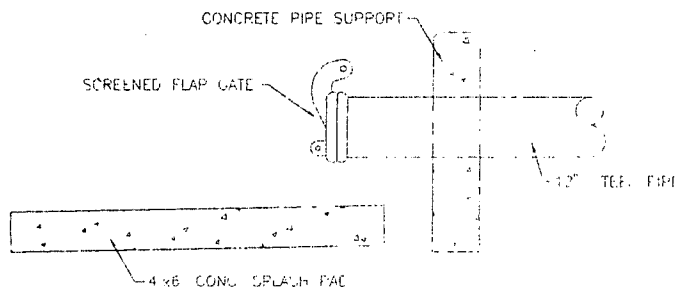
N.T.S



DETAIL -- DOUBLE ENTRANCE GATE

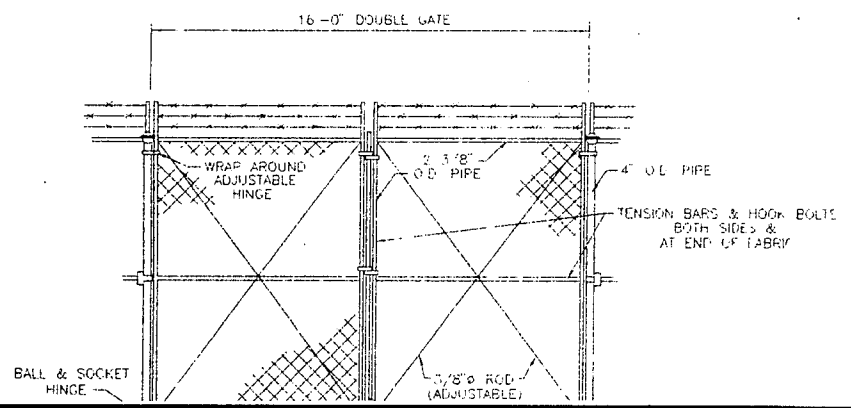
N.T.S

| | | | | | | | |
|-----|------|----------|-------|--------|------|-----------------------|--------|
| | | | | | | PROJECT 430 00 | |
| | | | | | | SCALE N.T.S DATE JUNE | |
| | | | | | | DESIGNED BY | JDR 5/ |
| | | | | | | DRAWN BY | GAR 5/ |
| | | | | | | CHECKED BY | REB 5/ |
| | | | | | | RECORD DRAWINGS | |
| NO. | DATE | REVISION | CHK'D | APPR'D | DATE | | |



DETAIL - FLAP GATE

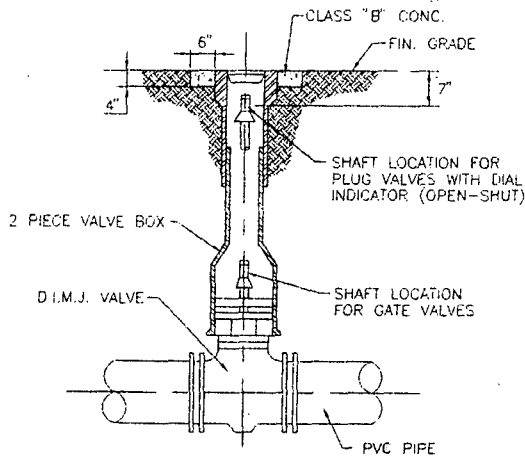
N. 1. 1



ST
D.S.
BF

| | | | | | | | | | | | |
|---------------------|--------|-----|-----|-----|-----|-----|--------|-------|--------|--------|-------|
| B | 50 | 42 | 38 | 34 | 26 | 23 | 18 | 13 | 9 | 9 | |
| C | 22 | 20 | 16 | 18 | 16 | 14 | 12 | 10 | 8 | 8 | |
| D | 26 | 22 | 18 | 16 | 13 | 11 | 9 | 6 | 4 | 4 | |
| 11 1/4" BEND | | | | | | | | | | | |
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" | |
| A | 36 | 30 | 27 | 24 | 18 | 16 | 13 | 11 | 9 | 9 | |
| B | 36 | 30 | 27 | 24 | 18 | 16 | 13 | 11 | 9 | 9 | |
| C | 22 | 20 | 16 | 18 | 16 | 14 | 12 | 10 | 8 | 8 | |
| D | 22 | 18 | 14 | 12 | 9 | 8 | 6 | 5 | 4 | 4 | |
| PLUG | | | | | | | | | | | |
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" | |
| A | 80 | 66 | 60 | 54 | 52 | 43 | 34 | 26 | 26 | 26 | |
| B | 80 | 66 | 60 | 54 | 52 | 43 | 34 | 26 | 26 | 26 | |
| C | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | |
| D | 72 | 60 | 54 | 44 | 32 | 22 | 15 | 11 | 11 | 11 | |
| TEE | | | | | | | | | | | |
| SIZE | MAIN | 24" | 20" | 18" | 16" | 12" | 12" | 12" | 8"-10" | 8"-12" | 2"-6" |
| | BRANCH | 24" | 20" | 18" | 16" | 12" | 8"-10" | 2"-8" | 8"-10" | 2"-6" | 2"-6" |
| A | | 80 | 66 | 60 | 54 | 52 | 42 | 28 | 43 | 26 | 26 |
| B | | 80 | 66 | 60 | 54 | 52 | 43 | 26 | 43 | 26 | 26 |
| C | | 45 | 36 | 32 | 30 | 12 | 12 | 12 | 12 | 12 | 12 |
| D | | 48 | 40 | 36 | 30 | 26 | 21 | 13 | 21 | 13 | 13 |

DIMENSIONS ARE IN INCHES



- 1. EXTRA PAY ALLOWED FOR CONC. COLLAR
- 2. RETE PAD SHALL BE SQUARE
- 3. RETE PAD REQUIRED ON ALL VALVES

DETAIL -- TYPICAL VALVE SETTING

N.T.S.

XIST. GRO

30" MIN.
DEPTH OF COVER

STONE
(MIN.)
IPE.

JESSAMINE COUNTY WATER DISTRICT NO. 1
1,000,000 GALLON ELEVATED WATER STORAGE TANK
AND BOOSTER PUMP STATION
JESSAMINE COUNTY, KENTUCKY

SHEET

7

OF

7

FLOW CONTROL VALVE/WATER LINE DETAILS

Ha

NCH

| 90° BEND | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 88 | 80 | 72 | 64 | 50 | 40 | 33 | 26 | 16 | 16 |
| B | 86 | 80 | 72 | 64 | 50 | 40 | 33 | 24 | 16 | 16 |
| C | 45 | 38 | 32 | 30 | 16 | 15 | 12 | 12 | 9 | 9 |
| D | 48 | 40 | 36 | 32 | 25 | 20 | 16 | 12 | 8 | 9 |

| 45° BEND | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 72 | 60 | 54 | 48 | 37 | 31 | 24 | 18 | 12 | 12 |
| B | 72 | 60 | 54 | 48 | 37 | 31 | 24 | 18 | 12 | 12 |
| C | 22 | 20 | 16 | 18 | 16 | 14 | 12 | 12 | 8 | 8 |
| D | 32 | 28 | 25 | 22 | 18 | 15 | 12 | 9 | 6 | 6 |

| 45° VERTICAL BEND | | | | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 72 | 60 | 60 | 45 | 36 | 36 | 36 | 36 | 24 | 24 |
| B | 60 | 48 | 48 | 45 | 36 | 36 | 36 | 36 | 24 | 24 |
| C | 96 | 84 | 84 | 72 | 60 | 60 | 60 | 60 | 48 | 48 |
| D | 84 | 72 | 72 | 60 | 48 | 48 | 48 | 48 | 36 | 36 |
| E | 84 | 72 | 72 | 60 | 48 | 48 | 48 | 48 | 36 | 36 |
| F | 84 | 72 | 72 | 60 | 48 | 48 | 48 | 48 | 36 | 36 |

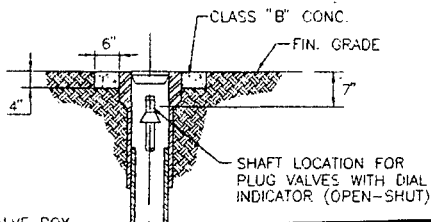
| 22 1/2° BEND | | | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 50 | 42 | 38 | 34 | 26 | 23 | 18 | 13 | 9 | 9 |
| B | 50 | 42 | 38 | 34 | 26 | 23 | 18 | 13 | 9 | 9 |
| C | 22 | 20 | 16 | 18 | 16 | 14 | 12 | 10 | 8 | 8 |
| D | 26 | 22 | 18 | 16 | 13 | 11 | 9 | 6 | 4 | 4 |

| 11 1/4° BEND | | | | | | | | | | |
|--------------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 36 | 30 | 27 | 24 | 18 | 16 | 13 | 11 | 9 | 9 |
| B | 36 | 30 | 27 | 24 | 18 | 16 | 13 | 11 | 9 | 9 |
| C | 22 | 20 | 16 | 18 | 16 | 14 | 12 | 10 | 8 | 8 |
| D | 22 | 18 | 14 | 12 | 9 | 8 | 6 | 5 | 4 | 4 |

| PLUG | | | | | | | | | | |
|------|-----|-----|-----|-----|-----|-----|----|----|----|----|
| SIZE | 24" | 20" | 18" | 16" | 12" | 10" | 8" | 6" | 4" | 2" |
| A | 80 | 66 | 60 | 54 | 52 | 43 | 34 | 26 | 26 | 26 |
| B | 80 | 66 | 60 | 54 | 52 | 43 | 34 | 26 | 26 | 26 |
| C | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| D | 72 | 60 | 54 | 44 | 32 | 22 | 15 | 11 | 11 | 11 |

| TEE | | | | | | | | | | | |
|------|-------------|-----|-----|-----|-----|-----|--------|-------|--------|--------|-------|
| SIZE | MAIN BRANCH | 24" | 20" | 18" | 16" | 12" | 12" | 12" | 8"-10" | 8"-12" | 2"-6" |
| | | 24" | 20" | 18" | 16" | 12" | 8"-10" | 2"-8" | 8"-10" | 2"-8" | 2"-6" |
| A | | 80 | 66 | 60 | 54 | 52 | 42 | 26 | 43 | 26 | 26 |
| B | | 80 | 66 | 60 | 54 | 52 | 43 | 26 | 43 | 26 | 26 |
| C | | 45 | 36 | 32 | 30 | 12 | 12 | 12 | 12 | 12 | 12 |
| D | | 48 | 40 | 36 | 30 | 26 | 21 | 13 | 21 | 13 | 13 |

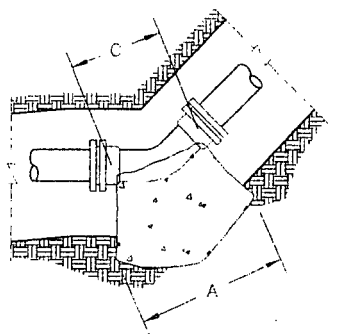
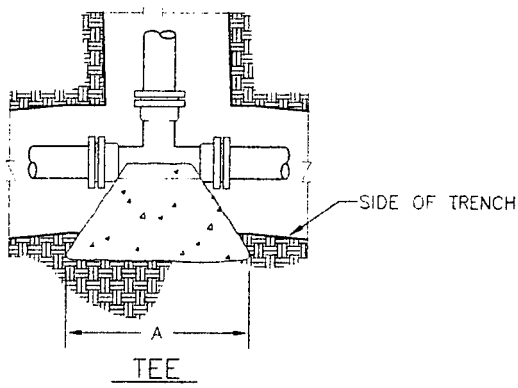
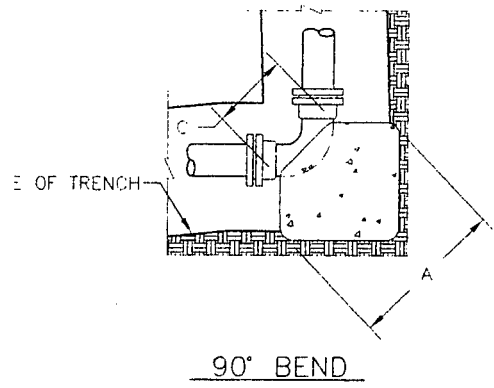
DIMENSIONS ARE IN INCHES



2 PIECE VALVE BOX

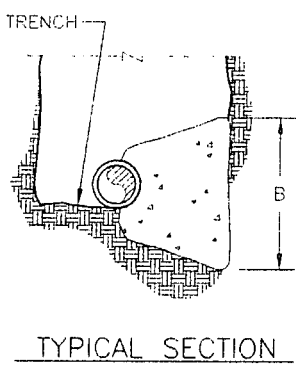
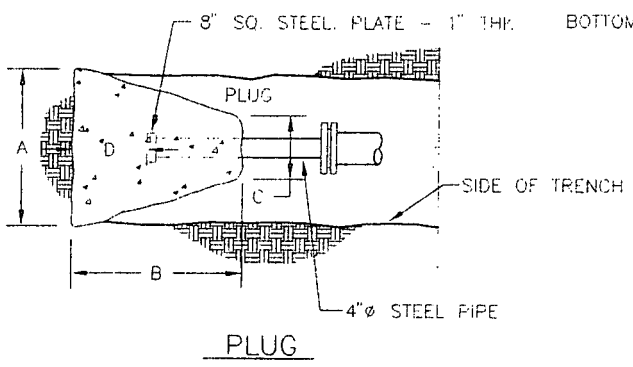
GIST. GRO

IN. COVER



45°-22 1/2°-11 1/4° BEND

- NOTES:
1. THRUST BLOCKS DESIGNED FOR 100 PSI PRESSURE AND 100G PSF SOIL BEARING. FOR GREATER PRESSURE OR LESS SOIL BEARING, QUANTITIES WILL HAVE TO BE RECALCULATED.
 2. THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH
 3. IF EXACT SIZE PIPE BLOCKING IS NOT SHOWN, USE NEXT LARGER SIZE
 4. THRUST BLOCKING TO BE POURED IN PLACE CLASS B CONC

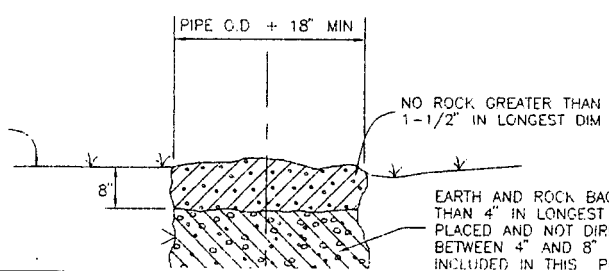


DETAIL - THRUST BLOCKING

N.T.S.

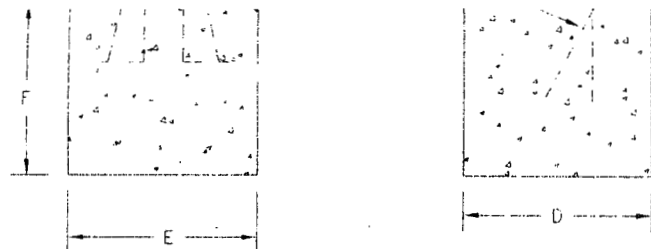
| | |
|------|---|
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |
| SIZE | A |
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| SIZE | C |
| SIZE | D |
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |
| SIZE | A |
| SIZE | B |
| SIZE | C |
| SIZE | D |

DIMENSIONS ARE IN



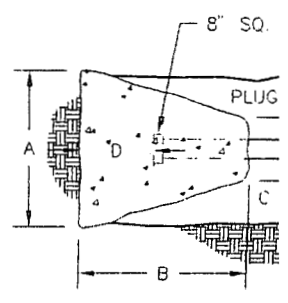
EARTH AND ROCK BACK FILL. NO ROCKS LARGER THAN 4" IN LONGEST DIM. ALLOWED. IF HAND PLACED AND NOT DIRECTLY OVER THE PIPE, ROCKS BETWEEN 4" AND 8" IN LONGEST DIM. MAY BE INCLUDED IN THIS PORTION OF THE BACKFILL.



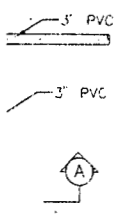


45° VERTICAL BEND

45°-22 1/2°-1



PLU



DETAIL - THRUST

N.T.S.

LEGEND

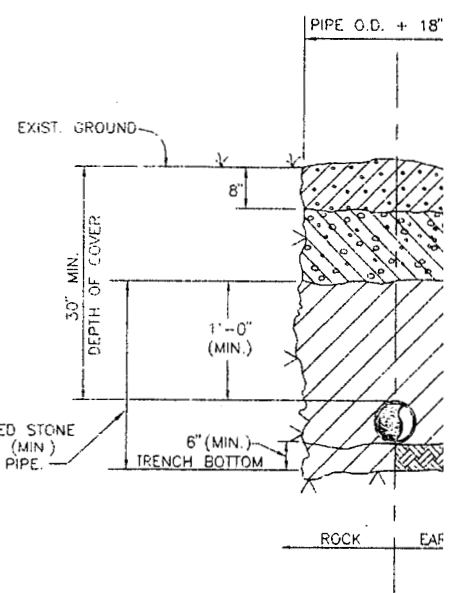
- ① 2 - 3"x3" M.J. TEES
- ② 3" GATE VALVE
- ③ 2 - 3" M.J. VALVES
- ④ 2 - 3" M.J. 90° BENDS
- ⑤ 2 - 3" DIPx48" (FLG.xP.E.)
- ⑥ 2 - 3" FLG GATE VALVE (HANDWHEEL)
- ⑦ 1 - 3" PRV (30-300 psi) CLA VAL #90G-DIABSY
- ⑧ 2 - 3"x2" SERV CLAMPS (MU H-16102)
- ⑨ 2 - 2" BRONZE CV (LUNKENHEIMER #2151)
- ⑩ 1 - 2" PRV CLA VAL #90G-DIABSY (30-300 psi RANGE W/ SCREWED END)
- ⑪ 2 PRESSURE GAUGES ASHCROFT 4 1/2" DURA-GAUGE W/ G-200 psi RANGE
- ⑫ 2" BRASS PIPE

DRAIN RIGHT

NOTE: BOTH PRV VALVES TO BE EQUIPPED WITH CLA-VAL CO X101 POSITION INDICATOR

PRV STATION INLET 94 PSI - OUTLET 64 PSI

NOTE: CONTRACTOR SHALL SET PRESSURE ON 2" PRV APPROXIMATELY 5 PSI HIGHER THAN 3" VALVES AS RECOMMENDED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.



NO. 67 CRUSHED STONE ONLY TO 1'-0" (MIN) ABOVE TOP OF PIPE.

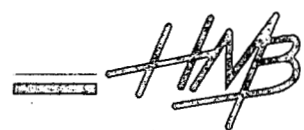
DETAIL - BEDDIN

N.T.S.

NUMBER 1 FOR LOCATION LOCATION WITH ENGINEER.

REDUCING STATION

| | | |
|---------------------------------|------|------|
| PROJECT: 430.00 | | |
| SCALE: AS NOTED DATE: JUNE 1998 | | |
| DESIGNED BY | NAME | DATE |
| DRAWN BY | DDM | |
| CHECKED BY | REB | |
| RECORD DRAWINGS | | |



Haworth, Meyer & E

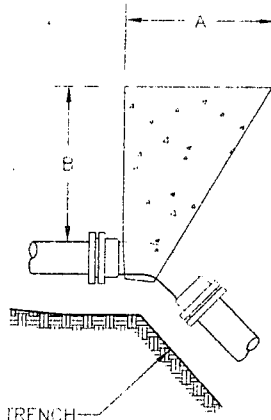
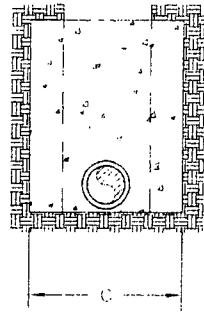
ENGINEERS • ARCHITECTS •

3 HMB Circle
Frankfort, Kentucky

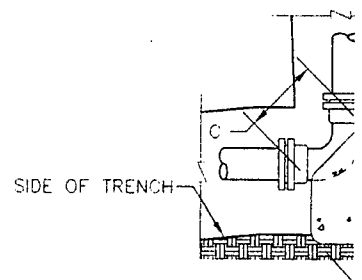
SOLENOID
 OTTLING VALVE
 (FCVI OR EQUAL
 N VAULT)
 J. SPOOL PIECES
 IRED)

DEPRESSED
 RUCTION JOINT
 WATER STOP

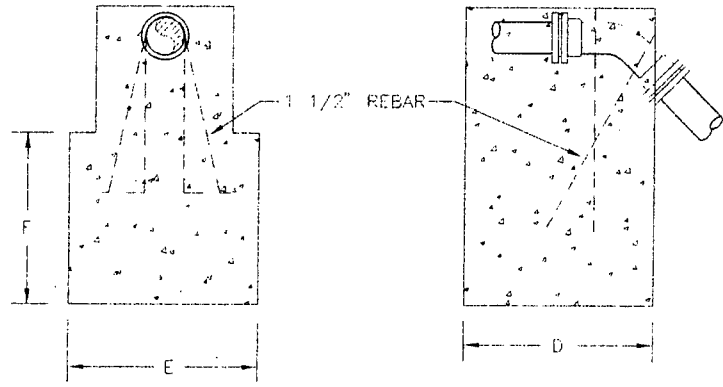
FLOOR



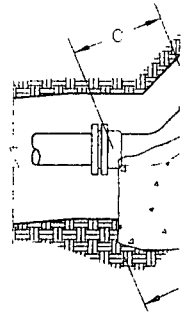
45° VERTICAL BEND



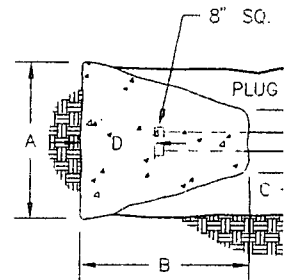
90° BEN



45° VERTICAL BEND



45°-22 1/2°-1



PLU

3" PVC

3" PVC



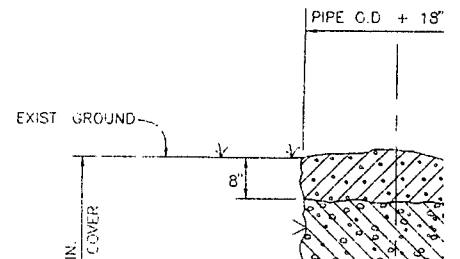
LEGEND

- ① 2 - 3"x3" M.J. TEES
- ② 3" GATE VALVE
- ③ 2 - 3" M.J. VALVES
- ④ 2 - 3" M.J. 90° BENDS
- ⑤ 2 - 3" DIPx48" (FLG.xP.E.)
- ⑥ 2 - 3" FLG GATE VALVE (HANDWHEEL)
- ⑦ 1 - 3" PRV (30-300 psi)
- ⑧ CLA VAL #90G-OIABSY
- ⑨ 2 - 3"x2" SERV CLAMPS (MU H-16102)
- ⑩ 2 - 2" BRONZE CV (LUNKENHEIMER #2151)
- ⑪ 1 - 2" PRV CLA VAL #90G-OIABSY (30-300 ps. RANGE W/ SCREWED END)
- ⑫ 2 PRESSURE GAUGES

DRAIN
 LIGHT

DETAIL - THRUST

N.T.S.



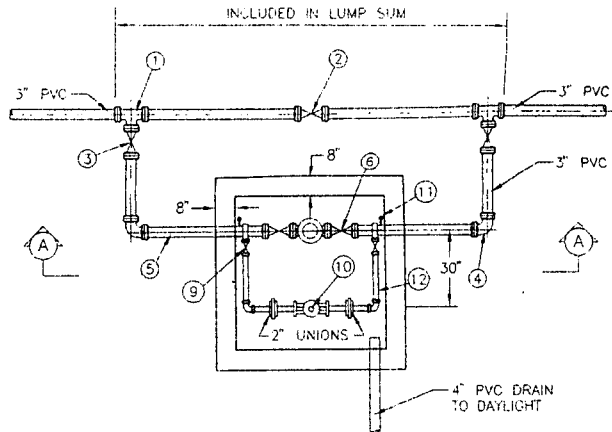
EXISTING FLOW STATION 311.
 CONTRACTOR IS RESPONSIBLE FOR WIRING FROM THE
 RTU TO THE CONTROL VALVE. AT THE CONTRACTOR'S
 OPTION, THE CONDUIT FOR THE WIRING CAN BE
 INSTALLED IN AN EXISTING CASINO PIPE WHICH IS
 IN PLACE UNDER LATNIP HILL ROAD.

CONTRACTOR SHALL PROVIDE A WATERPROOF VAULT

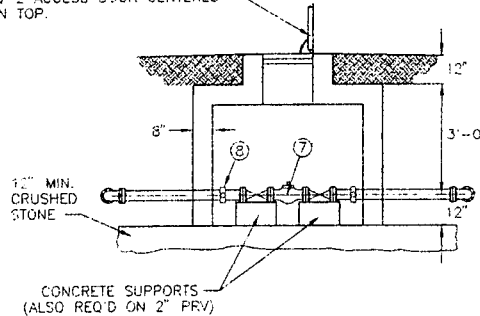
CONTROL VALVE SHALL BE FACTORY SET TO FLOW 150 GPM

DETAIL - FLOW CONTROL VALVE & VAULT

N.T.S.



PRECAST REINF. CONC. VAULT
 (5'x4'x5') & TOP W/ BILCO TYPE
 0-2 ACCESS DOOR CENTERED
 IN TOP.



SECTION A-A

LEGEND

- ① 2 - 3" x 3" M.J. TEI
- ② 3" GATE VALVE
- ③ 2 - 3" M.J. VALVES
- ④ 2 - 3" M.J. 90° EL
- ⑤ 2 - 3" DIP x 48" (F)
- ⑥ 2 - 3" FLO. GATE (HANDWHEEL)
- ⑦ 1 - 3" PRV (30-3 CLA VAL #90G-GIAE
- ⑧ 2 - 3" x 2" SERV C (MU H-16102)
- ⑨ 2 - 2" BRONZE G (LUNKENHEIMER #2
- ⑩ 1 - 2" PRV CLA V #90G-GIABSY (30-RANGE W/ SCREWEL
- ⑪ 2 PRESSURE GAUGE ASHCROFT 4 1/2" GAUGE W/ 0-200 RANGE
- ⑫ 2" BRASS PIPE

NOTE: BOTH PRV VALVES TO B CLA-VAL CO X101 PO

PRV STATION INLET 94

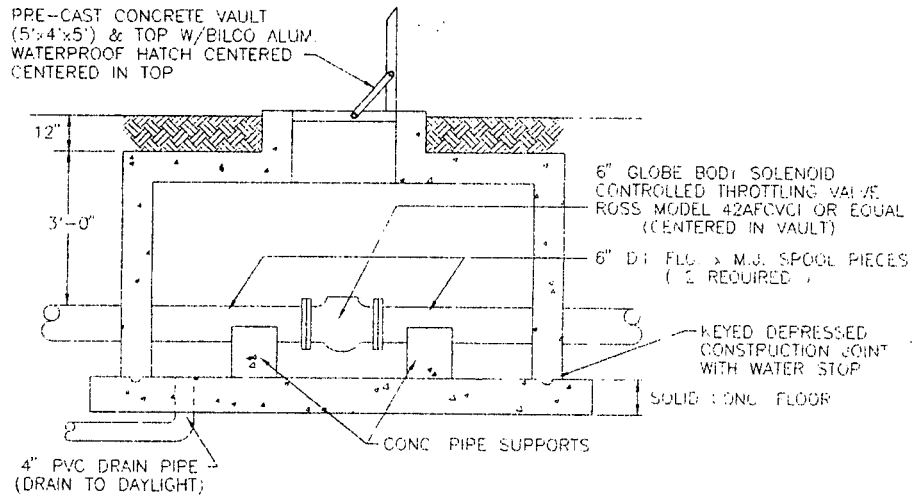
NOTE: CONTRACTOR SHALL SET APPROXIMATELY 5 PSI HIGHER RECOMMENDED BY THE MANUF BY THE ENGINEER.

NOTE: SEE SITE LOCATION SHEET NUMBER 1 FOR LOCATION OF THE PRV COORDINATE LOCATION WITH ENGINEER.

DETAIL - PRESSURE REDUCING STATION

N.T.S.

| | | | | | | |
|-----|------|----------|-------|--------|------|----------------------------|
| | | | | | | PROJECT: 430.00 |
| | | | | | | SCALE: AS NOTED DATE: JUNE |
| | | | | | | DESIGNED BY: LWC |
| | | | | | | DRAWN BY: DDM |
| | | | | | | CHECKED BY: REB |
| | | | | | | RECORD DRAWINGS: |
| NO. | DATE | REVISION | CHK'D | APPR'D | DATE | |



NOTES THE FLOW CONTROL VALVE SHALL OPERATE ON A SIGNAL RECEIVED FROM THE RTU LOCATED AT THE EXISTING PUMP STATION SITE

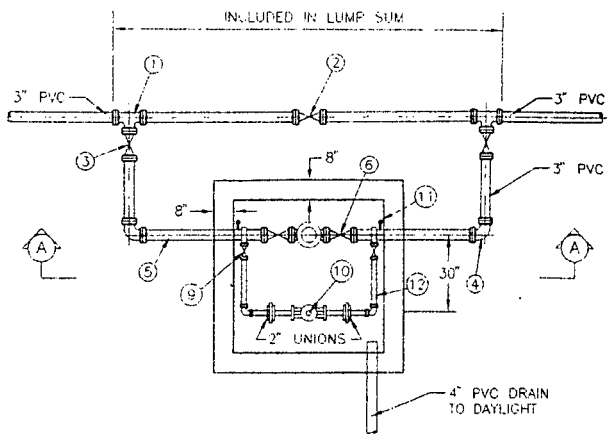
CONTRACTOR IS RESPONSIBLE FOR WIPING FROM THE RTU TO THE CONTROL VALVE AT THE CONTRACTOR'S OPTION, THE CONDUIT FOR THE WIRING CAN BE INSTALLED IN AN EXISTING CASING PIPE WHICH IS IN PLACE UNDER LATNIP HILL ROAD

CONTRACTOR SHALL PROVIDE A WATERPROOF VAULT

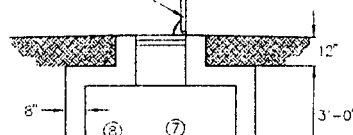
CONTROL VALVE SHALL BE FACTORY SET TO FLOW 150 GPM

DETAIL - FLOW CONTROL VALVE & VAULT

N.T.C.



PRECAST REINF. CONC. VAULT (5'4"x5') & TOP W/ BILCO TYPE O-2 ACCESS DOOR CENTERED IN TOP



LEGEND

- ① 2 - 3" x 3" M.J. TEE
- ② 3" GATE VALVE
- ③ 2 - 3" M.J. VALVES
- ④ 2 - 3" M.J. 90° BC
- ⑤ 2 - 3" DIP x 48" (FL
- ⑥ 2 - 3" FLG GATE (HANDWHEEL)
- ⑦ 1 - 3" PRV (30-3)
- ⑧ CLA VAL #90C-OIAB
- ⑨ 2 - 3" x 2" SERV CL (MU H-16102)
- ⑩ 2 - 2" BRONZE GV (LUNKENHEIMER #21)
- ⑪ 1 - 2" PRV CLA V# #90C-OIABSY (30-3 RANGE W/ SCREWED
- ⑫ 2 PRESSURE GAUGE