Phone: (931) 839-2350

Phone: (931) 839-2350

Phone: (931) 839-6380

www.cedesigners.com

October 29, 2014

TR.A. BESKET ROWN

Chairman Herb Hilliard ATTN: Patsy Fulton Tennessee Regulatory Authority 460 James Robertson Parkway Nashville, Tennessee 37243-0505 HAND DELIVERED

RE:

Petition of Hammerland Utilities, Inc. for a Certificate of Public Convenience and Necessity to Provide Wastewater Service - Docket No. 14-20/24

Dear Chairman Hilliard:

As the technical representative of the applicant, I am submitting the enclosed package.

Please find enclosed an original and four (4) hard copies of the above referenced petition. Also enclosed is an electronic copy on disc. Enclosed is a check for \$25.00 from Hammerland Utilities to cover the filing fee. Please sign and stamp the extra copy for our records.

Thank you for your assistance regarding this petition. If you have any questions, please do not hesitate to contact me.

Yours,

Mike Callahan, P.E. Chief Executive Officer

MC:jc

ENCL:

cc: Pam L. Bygden, Hammerland Utilities, Inc.

filed electronically on / /14

BEFORE THE TENNESSEE REGULATORY AUTHORITY NASHVILLE, TENNESSEE

October 7, 2014

Docket	No.	

RE:

PETITION OF HAMMERLAND UTILITIES, INC, TO OBTAIN A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR SEWER SERVICE TO A PART OF STEWART COUNTY, TENNESSEE KNOWN AS RIVER TRACE II

PETITION

Hammerland Utilities, Inc. ("Applicant"), pursuant to Tennessee Code Annotated, §65-4-201 et seq, and Chapter 1220-1-1-03 of the Tennessee Regulatory Authority's ("Authority") Rules and Regulations, submits its application for a Certificate of Public Convenience and Necessity to operate waste water disposal systems. The Applicant contends that approval of the Application is in the public interest in that its services will benefit consumers and, in support thereof, the Applicant states as follows:

1. A description of the service the applicant proposes to render.

Hammerland Utilities, Inc. proposes to own and operate a sewer collection and treatment system to homes and commercial establishments within the proposed service area described in Paragraph 2. These facilities shall be designed, constructed and operated in a manner to comply with all requirements of the Tennessee Department of Environment and conservation. Hammerland Utilities, Inc. will own and maintain the disposal system, the treatment works, the collection system and the individual septic tanks and pumping units. Hammerland Utilities, Inc. will not own any required pretreatment systems.

2. A description of the territory to be served and a map showing the territory.

The limits of the sewer service area which includes the customers which require immediate service and potential future developments are written as follows:

DESCRIPTION SEWER SERVICE AREA HAMMERLAND UTILITIES, INC.

Beginning at the intersection of the Stewart County Line and U.S. Highway 79 said beginning being on the Scott Fitzhugh Bridge; thence going northeast with the south right-of-way of U.S. Highway 79 to the west right-of-way of State Route 232; thence with the west right-of-way of State Route 232 to an intersection near Benchmark K 166; thence approximately south 30 degrees west down a draw to Dortch Hollow; thence with Dortch Hollow to standing Rock Creek; thence westward with Standing Rock Creek to the Stewart County Line; thence north along the Stewart County Line to the point of beginning

The map showing these service limits is shown in Paragraph 20f as Exhibit No. 1, "Sewer Service Limits".

A copy of the franchise granted by the City.
 This item is not applicable.

A description of any proposed franchise fee.

This item is not applicable.

5. Information regarding existing franchise for sewer service in Stewart County.

Stewart County, Tennessee does not grant a franchise for sewer service.

Therefore, this item is not applicable. During an interview on this subject with Rick Joiner, Stewart County Mayor, we determined that two water utility districts existed which do not have sewage treatment services in their charter. These are North Stewart Utility District and newly formed West Stewart Utility District. Mayor Joiner

assured me that to his knowledge, Stewart County had never issued a franchise for

sewer service.

The Town of Cumberland City is located 20 miles east of the proposed project. The Town of Dover is located 12 miles northeast of the proposed project. Both offer water and sewer service within and near the town limits. A small private contract sewage treatment facility is located on the west town limits of Dover serving a small commercial area. A small private contract sewage treatment facility is located on the north town limits of Dover serving the Stewart County High School.

6. <u>A statement of public need for sewer service including the number of customers to be initially served and estimates of growth.</u>

This item includes the following history which details the construction and usage of the existing sewer system, relations with the TDEC Groundwater Division and the proposal for the new decentralized treatment system.

History

In 1993, Hammerland Inc., a Tennessee corporation began the development of River Trace II using Lake Realtors as the local agent. Hammerland, Inc. is a subsidiary of Elmhurst Chicago Stone, Inc. of Elmhurst, Illinois. River Trace II was platted for 39 lots.

Upon finding that most of these lots were not satisfactory for septic field systems for sewage disposal, the developer contracted **C E DESIGNERS**, **INC**. to design a community sewage disposal system. Six acres of good percable soil were located in Sikes Hollow which were available for use. During the summer of 1994, a community sewer system was designed and constructed.

At each household, a watertight septic tank is installed with a screened pump assembly which pumps screened gray water to the common disposal system. The collection system was approximately 6,390 linear feet of 3-inch and 2-inch pipe. The common sewage works consisted of a concrete vault housing a dosing syphon, a second vault housing a distribution manifold and 5,000 linear feet of 10inch large diameter septic field lines in two sections. This field was sized to serve 18 homes. This system was completed and placed into operation in late 1994. The Owner applied for a State Operating Permit from the Division of Ground Water Protection, Tennessee Department of Environment and Conservation. This permit was issued by Bob James whose TDEC office was in Dover, Tennessee. The Owner commenced to sell lots and the purchasers built homes and connected to the sewer system.

In 2005, Bob James issued a repair permit which allowed the Owner to construct a second 5,000 linear foot septic field for future service to an additional 18 homes. In late 2013, the manifold was plugged with trash and gray water was running out on the ground continuously. In response to a citizen complaint, Ground Water Protection personnel investigated. Mr. James had retired and the new staff were not familiar with the project and could not find the file which contained these two permits. TDEC cited the developer for operating in violation and without a permit. Fortunately, the permit was in other files. At an enforcement meeting, TDEC offered two options. Option one was to issue a repair permit which limited by plat restrictions service to 18 homes only. This option is unsatisfactory to the Owner because at this time 7 homes are physically attached to the sewer system, 27 home sites and a condo site for 8 units have been sold, and 10 more home sites are available. This totals 52 units.

The second option is to replace the existing facilities with a decentralized system.

The Owner has accepted this second option. A copy of the Engineering Report describing the proposed facilities is attached in Paragraph 20g. The facilities consist of a recirculating sand filter and drip field disposal.

TDEC had determined that the River Trace II Home Owners Association could not have a permit to operate a sewage treatment facility and comply with the TDEC Regulation. To satisfy the organizational requirements of both TDEC and TRA, the Owner/Developer (Hammerland, Inc.) created a separate corporation to carry out this project. Hammerland, Inc. will continue to develop and sell property.

Hammerland Utilities, Inc. will assume ownership of the sewer system and obligations taken by Hammerland, Inc. Hammerland Utilities, Inc. will operate the existing collection system, will construct the proposed sewage treatment works, and will be responsible for all future management and maintenance.

Proposed Future Growth

The proposed treatment facility shown on the attached plans has a capacity of 15,000 gallons per day. This volume is equivalent to the TDEC rating of 300 gpd for a three bedroom housing unit times 50 units.

The same Owner/Developer has other property within the service area. There are also other properties within territory to be served belonging to others which could be convenient to development. The Kentucky Lake/Paris Landing area is very desirable for resort or vacation usage.

The proposed future growth described in this text only includes those projects which have been seriously discussed. These are:

- a. A resort hotel facing U.S. Highway 79 which would contain 64 high-end units with balconies facing to the lake. Underground parking would be constructed. Shuttle bus service across the lake to Paris Landing State Park and Golf Course and to other attractions would be provided;
- The addition of a wing behind the resort which includes 96 medium range units which would also have access to the resort amenities;
- A full service 100 seat restaurant located on the same property as the resort with lake views being closer to the lake;
- d. A recreation center located nearby which includes a tennis complex, indoor sports facilities, steam room and sauna, indoor and outdoor pools, etc.;

- e. A commercial center which could contain up to 100,000 square feet of space developed on an as needed basis; and
- f. A marina located at the foot of Lynn Hollow.

Since the proposed treatment facilities do not include this future growth in its design capacity, any development would have to include construction and permitting of additional facilities at the Sikes Hollow location. The estimated quantity of sewage flow generated by each of these proposals is given below:

a.	Resort Hotel	-	8,320 gpd
b.	Hotel Addition	-	12,480 gpd
C.	Restaurant	=	4,000 gpd
d.	Recreation Center	_	5,200 gpd
e.	Commercial Center	_	14,000 gpd
f.	Marina	_	6,000 gpd
TOT	AL POSSIBLE FUTURE SEWAGE FLOW		50,000 gpd

Paragraph 20f has these plans shown on Exhibit No. 2 "Master Plan".

7. Other public utilities, utility districts, or governmental units nearby unable or unwilling to provide service.

This was studied in the alternative analysis contained in the Engineering Report dated May 2013 which is included in Paragraph 20g and quoted below.

"Alternative Analysis

As in all projects, alternatives are available which must be analyzed. In this case, they are 1) to repair the existing system 2) connect to a nearby system 3) pump and haul sewage and 4) to construct an alternate system.

- The option to repair the existing system was rejected because of the severe restrictions placed by TDEC on the number of customers allowed. Repair is the least cost option at about \$35,000 but the obligation to serve 37 households exists.
- 2) The option to connect to a nearby system was evaluated and rejected as to costly. The Dover Sewer System is 12 miles away along a state highway. The cost of a pipeline and pumping stations is estimated to be \$900,000 plus treatment costs.

A public system is across Kentucky Lake but is 5 miles away of which 2 miles is a water crossing. The estimated cost of this proposal is \$1,500,000 plus treatment costs.

- 3) A pump and haul system was evaluated. At full capacity of 15,000 GPD, three truck loads would be required daily at \$200.00 each. It would take 417 days to spend an amount equal to the estimated cost of the recommended alternative treatment system at \$250,000.
- 4) Constructing an alternative system seems to be the most economic acceptable option. Together, the Owner and the Engineer evaluated several systems and agree that recirculating sand filter with drip field disposal is the best option. The cost is estimated to be \$250,000 to serve 50 units using the available 30 minute soil. Discharge criteria for similar systems is shown in the Engineering Report contained in Paragraph 20g.

Notice to affected utilities.

There are no existing public utility which provides sewer service near to the proposed project. However, as a matter of information the applicant sent a letter of notification to the following public and private utilities located within Stewart County:

Town of Cumberland City
P. O. Box 40
Cumberland City, Tennessee 37050

Town of Dover P. O. Box 447 Dover, Tennessee 37058

Rick Joiner, Stewart County Mayor P. O. Box 487 Dover, Tennessee 37058 North Stewart Utility District 2361 Highway 79 Dover, Tennessee 37058

West Stewart Utility District %Jim Butkiewiez 107 Raccoon Circle Dover, Tennessee 37058

Pickney Bros., Inc. 7638 River Road Pike Nashville, Tennessee 37209-5733

A copy of the contact letters and the responses are contained in 20i.

9. <u>Engineering and Construction Plans</u>

Attached in Paragraph 20g is a copy of the May 2013 Engineering Report, a copy of the Construction Documents and Specifications, a copy of the Construction Plans and a copy of the individual household installation. All of these documents have been submitted to the Tennessee Department of Environment and Conservation for approval.

10. A current Financial Statement for Hammerland Utilities, Inc.

The projected Financial Statement for the proposed sewage treatment facilities is shown in Paragraph 20h.

11. A detailed construction cost estimate.

A copy of the construction cost estimate is shown on the following page.

HAMMERLAND UTILITIES, INC. SEWAGE TREATMENT PLANT STEWART COUNTY, TENNESSEE

<u>ITEM</u>		NO. UNITS	U	NIT COST	T	OTAL COST
Site Grading		1	\$	8,000.00	\$	8,000.00
Recirculating Sand Filter	70' X 70'	2	\$	37,500.00	\$	75,000.00
Recirculation Tank		1	\$	30,000.00	\$	30,000.00
Recirculating Pumps		3	\$	5,000.00	\$	15,000.00
Site Piping		1	\$	15,000.00	\$	15,000.00
Disinfection and Controls		1	\$	15,000.00	\$	15,000.00
Drip Irrigation		15,000	\$	2.00	\$	30,000
Construction Contingency					\$	12,000.00
TOTAL ESTIMATED CON	STRUCTION COST				\$	200,000.00
	Engineering: Design	& General			\$	20,000.00
	Resident Inspection				\$	20,000.00
	Land & Rights-of-wa	ıy				
	Surveying				\$	5,000.00
	Legal					
	Project Contingency				\$	5,000.00
TOTAL ESTIMATED PRO-	JECT COST				\$	250,000.00

HAMMERLAND UTILITIES, INC. HOUSEHOLD PUMPING UNIT STEWART COUNTY, TENNESSEE

<u>ITEM</u>	UN	IT COST
1500 Gallon Two Chamber Septic and Pump Tank	\$	1,107
Simplex Pump Assy.		2,693
Electrical Connection		375
Freight and Miscellaneous		1,325
Labor		<u>1,000</u>
TOTAL ESTIMATED CONSTRUCTION COST	\$	6,500

12. <u>ProForma statement of operating cost for first five years.</u>

<u>ITEM</u>	MONTHLY COST	YEARLY COST	5 YEAR COST
Contract Operator	\$ 300	\$ 3600	\$ 18,000
Billing & Accounting	300	3600	18,000
Electricity	75	900	4,500
Misc.	15	180	900
Bond & Insurance	250	3000	15,000
Sales Tax	62	744	3720
Lawn Maintenance 16 times/yr	100	1200	6,000
Mowing Drip Field twice/yr	60	720	3,600
System O & M	<u>100</u>	<u>1200</u>	6,000
Subtotal - Operations	\$ 1262	15,144	\$ 75,720
Reserve - Major Repairs (to \$20,000)	200	2400	12,000
Pump Replacement Rese (to \$3500)	erve <u>100</u>	<u>1200</u>	<u>6,000</u>
Subtotal - Reserves	300	3600	18,000
TOTALS	\$ 1562	\$18,744	\$ 93,720

13. An analysis for projected growth for first five years.

	Existing <u>Users</u>	Year 1	Year 2	Year 3	Year 4	Year 5
Plus 1 Annually	7	8	9	10	11	12
Plus 2 Annually		9	11	13	15	17

It is assumed that on coming out of this economic recession, building within the project area will average two units per year. If so, the customer base will reach a self supporting level in the tenth year.

14. <u>Details of Proposed Financing</u>.

Hammerland, Inc. will construct the proposed sewage treatment and will furnish a performance bond to assure the completion of construction.

Elmhurst Chicago Stone, Inc. will loan Hammerland Utilities, Inc. \$20,000 at no interest for 10 years to cover any operational loss during the first 10 years of operation. After such time, it is projected that the sewer system will be self supporting.

15. <u>Proposed Rates and Method of Determination</u>.

The applicant proposes to charge each residential user a tap fee of \$6,500.00 for up to a three bedroom unit which shall pay the cost of equipment and installation of the septic tank, pumping unit and electrical service. The tap fee shall increase by \$1,000/bedroom over three. The tap fee shall be paid before the sewer connection is made. Existing users shall not be charged a tap fee. All owners of sold lots which have not connected shall be charged an access fee of \$120.00 per year payable on July 1st of each year. If a connection is made to the system during the following 12 months, the access fee shall be prorated and the balance refunded.

The residential service fee shall be a lump sum of \$50.00 per month with \$5.00 of that amount going into a reserve maintenance account. Additional charges shall be:

A check return fee of \$25.00

A late payment fee of 5 percent

A disconnect fee of \$25.00 (pump will be pulled to disconnect)

A reconnect fee of \$100.00 plus all back payments (to reinstall pump)

16. A description of the entity which owns the system with proof of existence.
Hammerland Utilities, Inc. is a wholly owned subsidiary of Elmhurst Chicago
Stone, Inc. of Chicago, Illinois. A copy of the charter is inserted along with a table of organization.

17. Certificate of Good Standing.

See Attached



STATE OF TENNESSEE Tre Hargett, Secretary of State

Division of Business Services

William R. Snodgrass Tower 312 Rosa L. Parks AVE, 6th FL Nashville, TN 37243-1102

Hammerland Utilities, Inc. 6471 E ANTIOCH RD BUCHANAN, TN 38222-4301

April 2, 2014 RECEIVED

MAY 1 4 2014

Filing Acknowledgment

TIME: 9:56.4m

Please review the filing information below and notify our office immediately of any discrepancies.

SOS Control #:

753180

Formation Locale:

TENNESSEE

Filing Type:

Corporation For-Profit - Domestic

Date Formed:

04/02/2014

Filing Date:

04/02/2014 2:04 PM

Shares of Stock:

Status:

100

Duration Term:

Active

Fiscal Year Close:

12 Annual Report Due: 04/01/2015

Business County:

Perpetual HENRY COUNTY

Image #:

A0233-1017

Document Receipt

Receipt #: 1439309

Filing Fee:

\$104.25

Payment-Credit Card - State Payment Center - CC #: 155346836

\$104.25

Registered Agent Address:

Hammerland Utilities, Inc.

PAMELA BYGDEN

6471 E ANTIOCH RD

BUCHANAN, TN 38222-4301

Principal Address: 6471 E ANTIOCH RD

BUCHANAN, TN 38222-4301

Congratulations on the successful filing of your Charter for Hammerland Utilities, Inc. in the State of Tennessee which is effective on the date shown above. You must also file this document in the office of the Register of Deeds in the county where the entity has its principal office if such principal office is in Tennessee. Visit the TN Department of Revenue website (apps.tn.gov/bizreg) to determine your online tax registration requirements.

You must file an Annual Report with this office on or before the Annual Report Due Date noted above and maintain a Registered Office and Registered Agent. Failure to do so will subject the business to Administrative Dissolution/Revocation.

Pam Martin, Register Henry County

Instrument #: 114434 Recorded 5/14/2014 at 9:56 AM in Record Book

Secretary of State



Division of Business Services
Tre Hargett, Secretary of State
State of Tennessee

312 Rosa L. Parks AVE, 6th FL Nashville, TN 37243-1102 (615) 741-2286

Filing Fee: \$100

For Office Use Only

Control # 000753180 FILED: Apr 2, 2014 2:04PM DLN # A0233-1017.001 Tre Hargett, Secretary of State

The undersigned, acting as incorporator(s) of a for-profit corporation under the provisions of the Tennessee Business Corporation Act, adopt the following Articles of Incorporation.			
1. The name of the corporation is: Hammerland Utilities, Inc. (Note: Pursuant to the provisions of T.C.A. §48-14-101(a)(1), each corporation name must contain the words corporation, incorporated, or company or the abbreviation corp., inc., or co.)			
2. Name Consent: (Written Consent for Use of Indistinguishable Name) This entity name already exists in Tennessee and has received name consent from the existing entity.			
3. This company has the additional designation of:			
4. The name and complete address of its initial registered agent and office located in the State of Tennessee is: Hammerland Utilities, Inc. PAMELA BYGDEN 6471 E ANTIOCH RD BUCHANAN, TN 38222-4301 HENRY COUNTY			
5. Fiscal Year Close Month: December Period of Duration: Perpetual			
6. If the document is not to be effective upon filing by the Secretary of State, the delayed effective date and time is: (none) (Not to exceed 90 days)			
7. The corporation is for profit.			
8. The number of shares of stock the corporation is authorized to issue is: 100			
9. The complete address of its principal executive office is: 6471 E ANTIOCH RD BUCHANAN, TN 38222-4301 HENRY COUNTY			
(Note: Pursuant to T.C.A. §10-7-503 all information on this form is public record.)			



Division of Business Services Tre Hargett, Secretary of State State of Tennessee

312 Rosa L. Parks AVE, 6th FL Nashville, TN 37243-1102 (615) 741-2286

Filing Fee: \$100

For Office Use Only

Control # 000753180 FILED: Apr 2, 2014 2:04PM DLN # A0233-1017.002 Tre Hargett, Secretary of State

The name of the corporation is: Hammerland Utilities, Inc.				
6471 E ANTIC		(if different from the principal offi	ce) is:	
11. List the nam	e and complete address of eac	h incorporator:		
Title	Name	Business Address	City, State, Zip	
	Charles E Simon	400 W. FIRST STREET	ELMHURST, IL 60124	
	Charles P Hammersmith	400 W. FIRST STREET	ELMHURST, IL 60124	
	Kenneth J Lahner	400 W. FIRST STREET	ELMHURST, IL 60124	
12. Professional Corporation: (required if the additional designation of "Professional Corporation" is entered in section 3.) □ I certify that this is a Professional Corporation. Licensed Profession:				
13. Other Provisions:				
(Note: Pursuant to T.C.A. §10-7-503 all information on this form is public record.)				
Apr 2, 2014 2:04PM Electronic				
Signature Date		Incorporator's Signature		
Charles E Simon				
Incorporator's Name (printed or typed)				



STATE OF TENNESSEE Tre Hargett, Secretary of State

Formation Locale: TENNESSEE

04/02/2014

Date Formed:

Fiscal Year Close 12

Division of Business Services

William R. Snodgrass Tower 312 Rosa L. Parks AVE, 6th FL Nashville, TN 37243-1102

Filing Information

Name: Hammerland Utilities, Inc.

General Information

SOS Control #:

753180

Filing Type:

Corporation For-Profit - Domestic

Filing Date:

04/02/2014 2:04 PM

Status:

Active

Duration Term:

Perpetual

Public/Mutual Benefit:

Mutual

Registered Agent Address

Hammerland Utilities, Inc.

PAMELA BYGDEN 6471 E ANTIOCH RD

BUCHANAN, TN 38222-4301

Principal Address

6471 E ANTIOCH RD

BUCHANAN, TN 38222-4301

The following document(s) was/were filed in this office on the date(s) indicated below:

Date Filed Filing Description

Image #

04/02/2014 Initial Filing

A0233-1017

Record Status Changed From: Pending To: Active

Active Assumed Names (if any)

Date

Expires



STATE OF TENNESSEE Tre Hargett, Secretary of State

Division of Business Services

William R. Snodgrass Tower 312 Rosa L. Parks AVE, 6th FL Nashville, TN 37243-1102

HAMMERLAND, INC.

PAMELA BYGDEN 6471 E, ANTIOCH ROAD BUCHANAN, TN 38222

March 6, 2014

Request Type: Certificate of Existence/Authorization

Request #:

0122308

Issuance Date: 03/06/2014

Copies Requested:

Document Receipt

Receipt #: 1353814

Payment-Credit Card - State Payment Center - CC #: 154749932

Filing Fee:

\$22,25 \$22.25

Regarding:

HAMMERLAND, INC.

Filing Type:

Corporation For-Profit - Domestic

Control #:

293372

Formation/Qualification Date: 04/13/1995

Date Formed:

04/13/1995

Status:

Active

Duration Term: Perpetual

Formation Locale: TENNESSEE

Business County: HENRY COUNTY

Inactive Date:

CERTIFICATE OF EXISTENCE

I, Tre Hargett, Secretary of State of the State of Tennessee, do hereby certify that effective as of the issuance date noted above

HAMMERLAND, INC.

- * is a Corporation duly incorporated under the law of this State with a date of incorporation and duration as given above;
- * has paid all fees, taxes and penalties owed to this State (as reflected in the records of the Secretary of State and the Department of Revenue) which affect the existence/authorization of the business:
- * has filed the most recent corporation annual report required with this office;
- * has appointed a registered agent and registered office in this State;
- * has not filed Articles of Dissolution or Articles of Termination. A decree of judicial dissolution has not been filed.

Secretary of State

Processed By: Cert Web User

Verification #: 006346221

Phone 615-741-6488 * Fax (615) 741-7310 * Website: http://tnbear.tn.gov/

CHARTER

OF .

HAMMERLAND, INC.

194313 Sakare

OF STATE

The undersigned, acting as the incorporator under the Tennessee Business Corporation Act, adopts the following charter for such corporation.

- 1. The name of the corporation is Hammerland, Inc.
- 2. The corporation is authorized to issue 100 common shares, which shares collectively shall have unlimited voting rights and the right to receive the net assets of the corporation upon dissolution.
- 3. The street address and zip code of the initial registered office is: William T. Looney, Attorney At Law, 127% North Poplar Street, P.O. Box 492, Paris, TN 38242.
- 4. The corporation's initial registered office is located the office of William T. Looney, Attorney At Law, 127% North Poplar Street, P.O. Box 492, Paris, TN 38242.
- 5. The name of the corporation's initial registered agent at that office is William T. Looney.
- 6. The name, address and zip code of the incorporator is: Michael G. Hammersmith, 400 West First Street, Elmhurst, IL 60126.
- 7. The street address and zip code of the principal office is: Lake Associates, Highway 79 East, Route 1, Box 106B, Buchanan, TN 38222.
 - 8. The corporation is for profit.

Date: 4-6-95

Michael G. Hammersmith Incorporator

STEWART COUNTY, TENNESSEE

Recorded: Book 25-8 page 460

Filed guly 11, 1995 1:19 P/m

Register Ruthe Mathis!

the Tennessee Secretary of State along with \$20/each to make the Corrections.





Tks Charley

1777007 0100 - 6500-6000 20

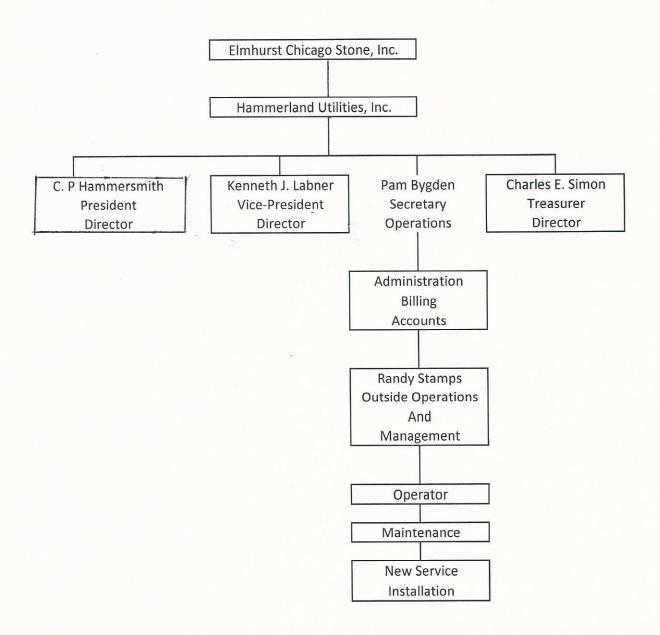
•		
otate of Tenneusee		For Office Use Only
Bepartment of Ginte Corporate Filings 312 Eighth Avenue North 6th Ploor, William R. Snodgrass Tower Nashville, TN 37243	ARTICLES OF CORRECTION	
Pursuant to the provisions of Section 48-1 the Tennessee Nonprofit Corporation Act, the 1. The name of the corporation is	1-305 of the Tennessee Business Corporation Act or S undersigned corporation hereby submits this applical ammeriand, inc.	Section 48-51-305 of Silon:
2. Please mark the santence below whi	ch applies.	
	filed) is attached. In (including its filing date) is given here: THE REPORT FORM, Reporting Yea	r:2013
it/they is/are incorrect: Secretary Kenneth E. Morg. Capacity because he is 4. The correct statement(s) is/are:	an. He is no longer serving in deceased. He is also no long	n this er a director
Secretary Pam Buaden si	ume address. She is not a ummersmith, Kenneth J Cahne	director.
	defective execution, state the manner in which the exec	ution was defective:
6. The correct execution should be:		
August 20, 2013 Signature Date	Hammerland, Inc.	
Treasurer Signer's Capacity	Signature Signature	
SS-4438 (Rev. 3/99)	Name (typed or printed)	RDA 1878



TOTAL 20,00

TABLE OF ORGANIZATION

HAMMERLAND UTILITIES, INC.



BIOGRAPHY OF CHARLES P. HAMMERSMITH, JR.

Charles P. Hammersmith, Jr. (Chip) was raised in Itasca, Illinois and grew up with two brothers and a sister. He attended Lake Park High School and went on to graduate from Augustana College in 1973.

After graduating from college, Chip began full time employment with Elmhurst-Chicago Stone Company, which has been owned and operated by the Hammersmith family since its inception in 1883. Chip has been the company President and CEO since 1983.

In addition to many other diverse business affiliations, Chip was an Owner/Director of Empress Casino in Joliet and Hammond from its formation in 1990 until 1999. His career has also included involvement in many civic and professional organizations, including the Economic Development Committee in Warrenville, Illinois and appointment by the Governor to the Illinois Aggregate Study Committee in 1978.

Chip maintains a close relationship with Augustana College and its administration where he tirelessly serves on the Board of Directors and various advisory and planning committees. The Hammersmith Family Foundation is a major benefactor of Augustana College and numerous other commendable organizations including Glenwood School for Boys, Cathedral of Hope, Braid Leadership Foundation. Chip is on the Board of Directors of the University of Chicago Cancer Research Center and enjoys contributing his time and talent to many commendable organizations.

As an avid outdoorsman, Chip looks forward to taking time for travel and fishing.

BIOGRAPHY OF KENNETH J. LAHNER

Kenneth J. Lahner was born in Chicago where he attended grade school and high school. Ken entered the Alr Force after graduating high school in July, 1950 and served until August, 1953.

Upon returning from the Air Force, Ken graduated from Northern Illinois University in DeKalb, Illinois. Subsequent to graduation, he began his professional career.

In 1970 Ken became President of the Itasca Park District in Itasca, Illinois where he and his family resided. As President, Ken successfully lead the Park District to land acquisitions which were used for a nature center and the building of swimming facilities.

Ken was encouraged to enter politics in 1978 where he was elected to the DuPage County Board, County Recorder in 1982 and served as County Administrator from 1984 to 1989. After twelve years in public service, Ken joined Elmhurst-Chicago Stone Company as a Vice President and has been with the company for twenty five years.

RESUME OF CHARLES E. SIMON

Charles E. Simon was born in Evanston, Illinois and raised on the north side of Chicago. He has two brothers and a sister. He attended St. George High School and upon graduation he attended Lewis College in Lockport, Illinois.

After graduating from college, Charley had various accounting positions with the following companies:

1972 - 1976	Harmony Co	Guitar manufacturer
1976 - 1985	Craft Clocks	Mail order clock kits
1985 - 1988	Ekco-Glaco	Commercial Baking Pans
1988 - 1990	Stewart Warner	Vehicle gauges

From 1990 to the present he has been working first as controller for Elmhurst Chicago Stone Company and presently as its Chief Financial Officer.

Charley has been married for forty years to the former Kathryn Zanghi and they have three children, two girl and a boy.

Charley and his family enjoy traveling, running events and hockey as past times.

18. Owners of the Company.

C. P. Hammersmith 400 W. First Street Elmhurst, Illinois 60126

Kenneth J. Lahner 400 W. First Street Elmhurst, Illinois 60126

Charles E. Simon 400 W. First Street Elmhurst, Illinois 60126

19. Not Applicable (Gas Companies Only).

20. Other Information.

- a. Deeds
- b. Rules and Regulations
- c. Resumes and Certifications
- d. Letter of Credit
- e. Copy of SOP Application
- f. Exhibits
- g. Plans and Specifications
- h. Financial Statement
- i. Contact Letters
- j. Prefiled Direct Testimony

20a. Deeds.

The Quitclaim Deed dated January 19, 1998 transferred ownership of the property needed for the large diameter septic field system and appurtenances installed in 1994.

The Quitclaim Deed dated March 1, 2013 transferred ownership of the additional property needed for the construction of the proposed decentralized sewage treatment system based on recirculating sand filters and drip fields.

The Ownership of this property has been assumed by Hammerland Utilities, Inc. as of May 15, 2014. The Quitclaim Deed dated May 15, 2014 transferred ownership of both tracts hereinbefore described property needed for the construction of the proposed decentralized sewage treatment system based on recirculating sand filters and drip fields.

THIS INSTRUMENT PREPARED WITHOUT BENEFIT OF TITLE EXAMINATION

THIS INSTRUMENT PREPARED BY: WILLIAM T. LOONEY, ATTORNEY P. O. BOX 492
PARIS, TENNESSEE 38242

QUITCLAIM DEED

THIS INSTRUMENT made and entered into on this the ______ day of jANUARY, 1998, by and between KENNETH E. MORGAN and wife, SHIRLEY A. MORGAN, parties of the first part, and HAMMERLAND, INC., a Tennessee Corporation, party of the second part;

WITNESSETH:

That for and in consideration of the sum of \$1.00 cash in hand paid, the receipt of which is hereby acknowledged, the parties of the first part convey and quitclaim unto the party of the second part, all their right, title and interest in and to the following described real estate, located in the Tenth Civil District of Stewart County, Tennessee, and being known as a portion of Tax Assessor's Map 110, Parcel (o.(V)), and being more particularly described as follows:

BEGINNING at a set iron pin in the north right of way of River Trace Drive, 25 feet from centerline; said pin being located, South 81 deg. 36 min. 27 sec. East 505.48 feet from a found iron pin in the original southwest corner of the property of which this is a portion; runs thence with severance lines: North 02 deg. 23 min. 42 sec. West 215.95 feet to a set iron pin; North 05 deg. 10 min. 57 sec. West 276.09 feet to a set iron pin; North 06 deg. 48 min. 28 sec. East 396.65 feet to a set iron pin; North 83 deg. 37 min. 27 sec. East 147.00 feet to a set iron pin; South 17 deg. 48 min. 46 sec. East 376.94 feet to a set iron pin; South 06 deg. 51 min. 01 sec. West 99.57 feet to a set iron pin; South 02 deg. 06 min. 23 sec. West 254.48 feet to a set iron pin; South 25 deg. 03 min. 26 sec. West 89.00 feet to a set iron pin; South 04 deg. 02 min. 51 sec. West 143.69 feet to a set iron pin in the north right of way of River Trace Drive, 25 feet from centerline; thence with the north right of way of River Trace Drive;, along a curve to the left, having a radius of 225.00 feet, an arc length of 104.08 feet, and being subtended by a chord bearing and distance of North 73 deg. 34 min. 05 sec. West 103.16 feet; North 86 deg. 49 min. 13 sec. West 106.61 feet to the point of beginning and containing 5.13 acres, more or less, according to survey and description of Larry I. Smith, RLS, Tennessee Reg. No. 824, dated December 15, 1997.

This being a portion of that real estate conveyed to KENNETH E. MORGAN by Executor's Deed of JOHN D. GLASS, Executor for the Estate of ARAHWANA RIDENS, deceased, dated December 7, 1984 and recorded in Deed Book 223, page 545-6, in the Register's office of Stewart County, Tennessee.

The said SHIRLEY A. MORGAN joins in the execution of this instrument to convey all her right, title and interest in said real estate as the wife of the said KENNETH E. MORGAN.

THE PURPOSE OF THIS CONVEYANCE IS FOR THE HEREIN DESCRIBED PROPERTY TO BE USED AS A SEPTIC FIELD FOR RIVER TRACE SUBDIVISION OWNED BY THE GRANTEE HEREIN, HOWEVER, IT IS HEREBY STIPULATED AND AGREED THAT SHOULD ANY PUBLIC UTILITIES BE RUN TO THE SAID SUBDIVISION OWNED BY THE GRANTEE HEREIN, THE HEREINDESCRIBED PROPERTY SHALL REVERT BACK TO THE GRANTORS HEREIN. IT WILL BE NECESSARY FOR THE GRANTEE TO EXECUTE A QUITCLAIM DEED CONVEYING SAID PROPERTY BACK TO THE GRANTORS HEREIN AT SUCH TIME.

IN TESTIMONY WHEREOF, the parties of	the first part have hereunto
set their signatures, this the day and da	te first above written.
Fein	elis Max
KENNETH I	. MORGAN
Shirten	J. a. Morgan
SHIRLEY &	. MORGAN
STATE OF TENNESSEE	
COUNTY OF HENRY	
Personally appeared before me, the	undorai and a No.
in and for said County and State, the withi	n named Francisco
and wife, SHIRLEY A. MORGAN, the bargainors	with whom I am many
acquainted, and acknowledged that they execut	ed the within instrument 5
the purposes therein contained.	od one within instrument for
My Commission Expires: $5-17$	-99
WITNESS my hand and official seal	
the day of January, 1998.	
Jania	NOTARY PUBLIC
V	MOTART CORPTES 34 14 1
NAME AND ADDRESS OF PROPERTY OWNER:	4
Elmhnest-Chgo. StonE	, g. 1.
<i>'</i>	
400 West First Street	
Cemburat, ellinois 1 60126	i, or we here by swear or affirm that to to
PARTIES RESPONSIBLE FOR PAYMENT OF TAXES:	information, and belief, the actual consideration for the tractive value of the property transferred, whichever is greater, in which amount is equal to ar greater that the amount which the property would compand at fair and values are Affant:
	Affiant County Subscribed and swarm to before me this the
	of Tulmuna in 1998
	Kutu mathia legistic
	- State of the sta
STATE OF TENNESSEE, STEWART COUNTY	
This instrument was filed 17	
time 1:16 / M. and recorded in	
Page 259 State Toy Paul Co	
Rec. Fee 800 Total 8.00 File Book	v, ?
Stewart County Register of Deeds RUTH MATHE	

THIS INSTRUMENT PREPARED WITHOUT TITLE SEARCH BY: Neese & Neese Attorneys At Law 314 North Market Street Paris, TN 38242 731-642-2189

Property Address: River Trace Drive Dover, TN 37058

--- Above This Line Reserved For Official Use Only---

QUITCLAIM DEED

WITNESSETH:

For and in consideration of \$1.00, sufficiency of which is hereby acknowledged, Grantor hereby conveys and quitclaims unto Grantee, its heirs and assigns, any and all her right, title and interest, in land lying in **Stewart County**, State of **Tennessee**, being more particularly described as follows:

Known as a portion of Assessor's Map 110, Group -, Parcel 6.00 in the Tenth Civil District of Stewart County, Tennessee.

TRACT A: BEGINNING at a ½-inch rebar found at the original northeast corner of Hammerland, Deed Book 294, Page 259; runs thence with Hammerland as follows: South 83 degrees 37 minutes 27 seconds West, 147.00 feet to a point; South 06 degrees 48 minutes 28 seconds West, 396.65 feet to a ½-inch rebar with cap set thence with a severance line as follows: North 01 degrees 00 minutes 48 seconds East, 320.72 feet to a ½-inch rebar with cap set; North 08 degrees 06 minutes 14 seconds East, 93.84 feet to a ½-inch rebar with cap set; North 82 degrees 59 minutes 20 seconds East, 128.01 feet to a ½-inch rebar with cap set; South 68 degrees 02 minutes 05 seconds East, 50.85 feet to the Point of Beginning and containing 0.25 acres, more or less, as surveyed by Thomas A. Young, Tennessee Registered Land Surveyor Number 2265, of L. 1. Smith & Associates, 302 North Caldwell Street, Paris, TN 38242, on February 26, 2013. Bearings are based upon a record bearing found in Deed Book 294, Page 259.

TRACT B: BEGINNING at a 1/2-inch rebar found at the eastern most corner of Hammerland, Deed Book 294, Page 259; runs thence with a severance line South 03 degrees 26 minutes 24 seconds West, 353.81 feet to a 1/2-inch rebar with cap set in the east line of Hammerland; thence with Hammerland as follows: North 02 degrees 06 minutes 23 seconds East, 254.48 feet to a point; North 06 degrees 51 minutes 01 seconds East, 99.57 feet to the Point of Beginning and containing 0.02 acres, more or less, as surveyed by Thomas A. Young, Tennessee Registered Land Surveyor Number 2265, of L. I. Smith & Associates, 302 North Caldwell Street, Paris, TN 38242, on February 26, 2013. Bearings are based upon a record bearing found in Deed Book 294, Page 259.

This being a portion of the real property conveyed to Kenneth E. Morgan by Executor's Deed dated December 7, 1984 and of record in Deed Book 223, pages 545-546 in the Register's Office of Stewart County, Tennessee. Kenneth E. Morgan died testate on December 29, 2010 leaving his Last Will and Testament of record in Will Book J, pages 65-77 in the Probate Division of the Chancery Court of Stewart County, Tennessee devising to Shirley A. Morgan all his real property.

THE PURPOSE OF THIS CONVEYANCE IS FOR THE HEREIN DESCRIBED PROPERTY TO BE USED AS A SEPTIC FIELD FOR RIVER TRACE SUBDIVISION OWNED BY THE GRANTEE HEREIN, HOWEVER, IT IS HEREBY STIPULATED AND AGREED THAT SHOULD ANY PUBLIC UTILITIES BE RUN TO THE SAID SUBDIVISION OWNED BY THE GRANTEE HEREIN, THE HEREINDESCRIBED PROPERTY SHALL REVERT BACK TO THE GRANTOR HEREIN. IT WILL BE NECESSARY FOR THE GRANTEE TO EXECUTE A QUITCLAIM DEED CONVEYING SAID PROPERTY BACK TO GRANTOR HEREIN AT SUCH TIME.

IN WITNESS WHEREOF, the Grantors, who are authorized to execute this conveyance, have hereunto set their signatures this 1 day of March, 2013. Shirley A. Morgan Individually and as Personal a Representative of the Estate of Kenneth E. Morgan by and through her attorney-in-fact, Kelly Lynn STATE OF TENNESSEE COUNTY OF HENRY On this the day of February, 2013, before me personally appeared Kelly Lynn Roban, known to me or satisfactorily proven, to be the party executing the foregoing instrument on behalf of Shirley A. Morgan, Individually and as Personal Representative of the Estate of Kenneth E. Morgan, and who acknowledged that she executed the same as the free act and deed of Shirley A. Morgan Individually and as Personal Representative of the Estate of Kenneth E. Morgan. Notary Public My Commission expires: Owner and Person responsible for taxes: Hammerland, Inc. c/o Elmhurst Chicago Stone 400 West 15th Street Elmhurst, IL 60126 STATE OF TENNESSEE COUNTY OF HENTLY I swear and affirm that the actual consideration of this transfer or value of the property transferred whichever is greater is \$0.00, which amount is equal to or greater than the amount which the property transferred would command at a fair voluntary sale. Jaffiant Jaffiant Sworn to and subscribed before me this, the day of My Commission expires: 10/2 This Quitclaim Deed is exempt from Tennessee Recordation Tax pursuant to Tenn. Code Ann.

0.00

This document prepared by Attorneys Title & Escrow, A Division of Ainley, Hoover & Hoover 200 North Poplar Street, Paris, Tennessee 38242.

This instrument was prepared without the benefit of a Title Opinion or Survey.

QUITCLAIM DEED

THIS INSTRUMENT made and entered into on this the between HAMMERLAND, INC., a Tennessee Corporation, ("Grantor"), and HAMMERLAND UTILITIES, INC., ("Grantee").

WITNESSETH

FOR AND IN CONSIDERATION of the sum of One dollar (\$1.00) and other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged, Grantor does hereby convey, transfer, remise, release, relinquish and quitclaim unto Grantee, its successors and assigns, all of Grantor's right, title and interest in the property having an address of River Trace Drive, Dover, TN 37058 and being more particularly described as follows:

SEE ATTACHED EXHIBIT "A"

TO HAVE AND TO HOLD, all and singular the above-described land and premises, with the appurtenances, unto grantee, its successors and assigns, to the only proper use, benefit, and behoof of grantee, its successors and assigns forever.

THE PARTIES HERETO ACKNOWLEDGE that Attorneys Title & Escrow, A Division of Ainley, Hoover & Hoover, PLLC is not the closing agent for this transaction, pursuant to the provision of Section 6045(e) of the Internal Revenue Code, as amended by the Tax Reform Act of 1986.

IN WITNESS WHEREOF, the Grantor has caused this instrument to be executed on the date first above written.

HAMMERLAND, INC. a Tennessee Corporation

Pamela L. Bygden, Secretary

STATE OF TENNESSEE

COUNTY OF Henry

Before me, the undersigned authority, a Notary Public of the State and county mentioned, personally appeared Pamela L. Bygden, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who, upon oath, acknowledged herself to be Secretary (or other officer authorized to execute the instrument) of Hammerland, Inc., the within named bargainor, a corporation, and that such officer, executed the foregoing instrument for the purpose therein contained, by personally signing the name of the corporation as Secretary (or other authorized officer).

Witness my hand, at office, this b day of May, 2014.

My Commission expires: 1/24/15

Notary Public

OWNER OF PROPERTY AND PARTIES RESPONSIBLE FOR TAXES:

Hammerland Utilities, Inc.
6471 E. Hintioch Road
Buchanan, TN 38222

I, or we, hereby swear or affirm that the actual consideration for this transfer or value of the property transferred, whichever is greater, is \$1.00, which amount is equal to or greater than the amount which the property transferred would command at a fair voluntary sale.

Affiant

Subscribed and sworn to before me this _

day of May, 2014

Notary Public

My commission expires $1/24/15^{-1}$

This instrument prepared without benefit of a Title Opinion by: ATTORNEYS TITLE & ESCROW
A DIVISION OF AINLEY, HOOVER & HOOVER PLLC
200 NORTH POPLAR STREET
PARIS, TENNESSEE 38242

Exhibit "A"

Map 110, Group -, Parcel 6.19 Tenth Civil District of Stewart County, Tennessee

TRACT NO. 1: Beginning at a set iron pin in the north right of way of River Trace Drive, 25 feet from centerline; said pin being located, South 81 deg. 36 min. 27 sec. East 505.48 feet from a found iron pin in the original southwest corner of the property of which this is a portion; runs thence with severance lines: North 02 deg. 23 min. 42 sec. West 215.95 feet to a set iron pin; North 05 deg. 10 min. 57 sec. West 276.09 feet to a set iron pin; North 06 deg. 48 min. 28 sec. East 396.65 feet to a set iron pin; North 83 deg. 37 min. 27 sec. East 147.00 feet to a set iron pin; South 17 deg. 48 min. 46 sec. East 376.94 feet to a set iron pin; South 06 deg. 51 min. 01 sec. West 99.57 feet to a set iron pin; South 02 deg. 06 min. 23 sec. West 254.48 feet to a set iron pin; South 25 deg. 03 min. 26 sec. West 89.00 feet to a set iron pin; South 04 deg. 02 min. 51 sec. West 143.69 feet to a set iron pin in the north right of way of River Trace Drive, 25 feet from centerline; thence with the north right of way of River Trace Drive; along a curve to the left, having a radius of 225.00 feet, an arc length of 104.08 feet, and being subtended by a chord bearing and distance of North 73 deg. 34 min. 05 sec. West 103.16 feet; North 86 deg. 49 min. 13 sec. West 106.61 feet to the point of beginning and containing 5.13 acres, more or less, according to survey and description of Larry I. Smith. RLS, Tennessee Reg. No. 824, dated December 15, 1997.

Subject to septic field condition as set out in Deed Book 294, page 259, in the Register's Office of Stewart County, Tennessee.

This being the same real estate conveyed to Hammerland, Inc., a Tennessee Corporation, by Warranty Deed of Kenneth E. Morgan and wife, Shirley A. Morgan, dated January 19, 1998 and of record in Deed Book 294, page 259, in the Register's Office of Stewart County, Tennessee.

TRACT NO. 2: BEGINNING at a 1/2-inch rebar found at the original northeast corner of Hammerland, Deed Book 294, Page 259; runs thence with Hammerland as follows: South 83 degrees 37 minutes 27 seconds West, 147.00 feet to a point; South 06 degrees 48 minutes 28 seconds West. 396.65 feet to a 1/2-inch rebar with cap set thence with a severance line as follows: North 01 degrees 00 minutes 48 seconds East, 320.72 feet to a 1/2-inch rebar with cap set; North 08 degrees 06 minutes 14 seconds East, 93.84 feet to a 1/2-inch rebar with cap set; North 82 degrees 59 minutes 20 seconds East, 128.01 feet to a 1/2-inch rebar with cap set; South 68 degrees 02 minutes 05 seconds East, 50.85 feet to the Point of Beginning and containing 0.25 acres, more or less, as surveyed by Thomas A. Young. Tennessee Registered Land Surveyor Number 2265, of L. I. Smith & Associates. 302 North Caldwell Street, Paris, TN 38242, on February 26, 2013. Bearings are based upon a record bearing found in Deed Book 294, Page 259.

TRACT NO. 3: BEGINNING at a 1/2-inch rebar found at the eastern most corner of Hammerland, Deed Book 294, Page 259; runs thence with a severance line South 03 degrees 26 minutes 24 seconds West, 353.81 feet to a 1/2-inch rebar with cap set in the east line of Hammerland: thence with Hammerland as follows: North 02 degrees 06 minutes 23 seconds East, 254.48 feet to a point; North 06 degrees 51 minutes 01 seconds East, 99.57 feet to the Point of Beginning and containing 0.02 acres, more or less, as surveyed by Thomas A. Young, Tennessee

Registered Land Surveyor Number 2265, of L. I. Smith & Associates, 302 North Caldwell Street, Paris, TN 38242, on February 26, 2013. Bearings are based upon a record bearing found in Deed Book 294, Page 259.

Subject to septic field condition as set out in Record Book 160, page 48, in the Register's Office of Stewart County, Tennessee.

Tract Nos. 2 and 3 being the same real estate conveyed to Hammerland, Inc., a Tennessee Corporation, by QuitClaim Deed of Shirley A. Morgan, Individually and as Personal Representative of the Estate of Kenneth E. Morgan, by and through her Attorney-In-Fact, Kelly Lynn Roban, dated March 1, 2013 and of record in Record Book 160, page 48, in the Register's Office of Stewart County, Tennessee.

Derek Barhart, Register Stewart County Tennessee Rec #: 35723 Instrument #: 43072 Rec'd: 20.00 Recorded State: 0.00 5/19/2014 at 10:30 AM Clerk: 0.00 in Record Book Other: 2.00 172 Total: 22.00 Pgs 695-698 20b. Rules and Regulations.

HAMMERLAND UTILITIES, INC. A PROVIDER OF SEWER SERVICE IN STEWART COUNTY, TENNESSEE

RULES AND REGULATIONS

A.	Sewer service shall be furnished within the boundaries of the sewer service area
	exclusively by Hammerland Utilities, Inc., a Tennessee Corporation. Such a service
	shall be subject to these rules and regulations, as well as any rules and regulations
	hereinafter amended, modified or promulgated, which are made a part of every
	application, contract and agreement entered into between the property owner or
	customer and the Company.
	Hammerland Utilities, Inc. is a corporation organized and engaged in business as
	a developer and as a public utility in the State of Tennessee. The Company is
	regulated under a Certificate of Convenience and Necessity issued by the
	Tennessee Regulatory Authority (TRA) on, 2014, under Docket No.
	, and subsequent certificates issued by the TRA.

B. Definitions

- Company The Company is defined as Hammerland Utilities, Inc. which
 provides sewage collection, treatment and disposal to such residence or
 business who applies to become a customer.
- 2. Customer A Customer is defined as any person, firm, corporation, association or government unit contracting with the Company for the furnishing of sewer service to property described as a single residential unit or a single commercial unit whether freestanding or connected to other units.

- 3. Developer A Developer shall be defined as a person or other legal entity other than the Company who divides property for the purpose of resale, construction of buildings, or divided uses. If a developer does develop property, which requires public sewer service, the Company shall be the sole provider.
- 4. Developed Lot A Developed Lot shall be defined as any tract of land fronting on a road in which a sewage collector line or main line is located. This definition is used to determine which tracts or lots have access to the sewer system.
- Engineer The Engineer shall be the exclusive consulting engineer employed by the Company.
- 6. Service Connection The Service Connection is defined as the point where the Building Outfall Line (a minimum of 4-inches in diameter) connects to either the Septic Gravity Tank or the Septic Pump Tank. This point also divides the ownership of facilities with the Building Outfall Line belonging to the property owner and the septic tank belonging to the Company.
- 7. Septic Gravity Tank The Septic Gravity Tank is located near the customers point of discharge to accept waste and contains an effluent filter to discharge gray water. Connection to the household electrical service and the household providing electricity to the Septic Pump Tank does not void the ownership of the Septic Pump Tank by the Company.

- Septic Pump Tank The Septic Gravity Tank is located near the customers
 point of discharge to accept waste and contains a screened effluent pump
 to discharge gray water.
- 9. Gray Water Gray Water is settled or screened sewage.
- Service Line The Service Line is the line from the septic gravity or septic pump tank to the collector line.
- Collector Line The Collector Line is the sewer line from the service line to the larger main line.
- Main Line The Main Line carries sewage from the collector lines to the Treatment Facilities.
- 13. Treatment Facilities The Treatment Facilities shall be defined as those components of the sewage works which provide an element in the treatment chain or an element of disposal.
- 14. Pumping Station A Pumping Station shall be defined as a tank which contains pumps and receives effluent sewage from Septic Gravity Tanks or Gravity Collector Lines.
- C. The Company shall establish and make available to the customer a rate schedule for monthly service, tap fees and other fees.
- D. The Company shall be the exclusive provider of sewage services within the Sewer Service Boundaries except than an industry wishing to provide its own treatment and operation and has a NPDES discharge permit shall not be prevented from providing sewer service to itself.

- E. The Company shall design, construct, own and maintain all facilities required to collect, transport, treat and dispose of sewage except the Building Outfall Line. The developer shall pay all cost necessary for the construction of facilities. The customers contribution to the operation and maintenance of the facilities shall be as access fees, tapping fees and monthly service bills..
- F. A developer requiring sewer service shall submit a plat to the Company for review. The Engineer will develop a cost estimate. If acceptable to the developer, the developer shall pay the Company the cost of engineering. The Engineer shall prepare plans and shall obtain the approval of the Tennessee Department of Environment and Conservation. At this time, the developer shall pay the Company one half the estimate and the Company order material. When the material arrives, the developer shall pay the Company the balance of the estimate. The Company shall employ an approved contractor to build the project. A final settlement shall be made with the developer upon completion and acceptance of the work.
- G. When it is necessary the customer will provide, at no cost, a suitable place for the location of on-site facilities upon the customer's property, and will give an easement to the Company for any property of the Company located upon customer's land.

 Access to this easement shall be at a reasonable time.
- H. The customer shall be liable for any damage incurred to the Company's property resulting from customer's negligence.

- The Company shall in its discretion, specify how and what uses may be made of sewer service by customer and if the customer fails to comply with the uses so specified, customer shall be subject to having his sewer service forthwith terminated.
- J. In the event the Company shall see fit to extend any main line of its sewage works, the Company shall, upon considering all circumstances, determine whether a customer or customers shall bear the expense of this extension.
- K. In the event a customer removes himself or his business from a serviced location at which he is receiving sewer service, he shall if at all possible, give the Company 15 days' notice of his intention to move. The customer shall be responsible for payment of sewer service received up to the date his service is terminated and his deposit may be applied against his sewer bill. In the event a customer desires to move to a new location within the service area, he shall pay a service charge of service connection installation together with a deposit.
- L. Each customer before installation of service shall be required to execute on the appropriate forms furnished by the Company, a Sewer Subscription Contract.
- M. Service under any application may be discontinued for the following reasons:
 - 1. Non-payment of bill as hereinafter set forth below
 - 2. Failure to sign a contract
 - 3. For misrepresentation of application
 - For adding to the property without notice to the Company
 - 5. For tampering with any service pipe, tank, control system, filter or any other facilities of the Company in any way whatsoever

- 6. For violation of any rules of the Company
- 7. For disconnecting or reconnecting service by any party, other than a duly authorized agent of the Company, without the consent of the Company
- N. For all sewage connections the Company reserves the right to require any non-residential user to provide special pre-treatment for any high strength effluent before discharge into its sewage system. The Company may, upon the basis of recognized engineering standards and treatment costs, increase the rate charged to cover the cost of treatment of high strength effluent or industrial waste, and may impose recognized engineering standards as to the maximum size of solids and constituents in such waste discharged into its sewage system.

Additionally, if excessive volumes of sewage are received, the Company may require the customer to monitor flow volume and increase surge holding capacity at the customer's expense. All customers will be required to follow the Owners User Manual for an effluent collection system supplied to them by the Company. These requirements prohibit the dumping of any toxic chemicals that kill tank bacteria and disposal of an excessive amount of grease, among other things. All requirements (and notification of repair costs associated with the system abuse) are established in the Customer's Sewer Subscription Contract with the Company. Connection of storm drains is not permitted.

O. The Company shall in no event be responsible for maintaining any Building Outfall
Line owned by the customer, nor for damages created by sewage escaping there
from, nor for defects in customer's building lines or fixtures. The customer shall at
all times comply with all regulations of the TRA and of the Company.

All leaks in any building pipe or fixture on the premises of the customer shall be

immediately repaired by the customer. On failure to repair any such leak, the

service may be discontinued until repairs are made. Any customer found

introducing prohibited substances into the waste water system is liable to pay full

cost of cleanup and the repair of any damage caused.

P. All pipes, valves and fixtures shall be, at all reasonable hours, subject to inspection

by the Company or its duly appointed agent.

The Company shall not be liable to the customer for interruption in service, or for Q.

damages or inconvenience as a result of any interruption, stoppage, etc., which was

beyond the reasonable control of the Company.

In case of emergency, call 731-676-0055

Public Contact

Pam Bygden

6471 E. Antioch Road

Buchanan, Tennessee 38222

Phone: 731-642-1399

Tennessee Regulatory Authority Regulations

The Company, in its operation, shall conform to all applicable rules and regulations

promulgated from time to time by the Tennessee Regulatory Authority. The TRA

can be reached by phone at 1-800-342-8359 or 615-741-2904.

ATTACHMENT 1

SEWER SERVICE CONTRACT AGREEMENT

	DATE:
PRINTED NAME	
ADDRESS OF PROPERTY	
MAILING ADDRESS	
TELEPHONE NUMBER	EMAIL ADDRESS

I hereby make application to Hammerland Utilities, Inc. for sewer service at the address of property stated above. In consideration of the undertaking on the part of Hammerland Utilities, Inc. to furnish sewer service, I understand, covenant and agree as follows:

1. I understand that the components of a sewer system have been installed on the property referred to above, which is owned or occupied by me, and which is to be connected with a waste water disposal system owned and/or maintained by Hammerland Utilities, Inc. I warrant that any connection to and/or subsequent use to this system by the components on my property shall be in accordance with the Rules, Regulations and Plans of Hammerland Utilities, Inc. Regarding my usage of the system components on my property, which are owned by Hammerland Utilities, Inc. or me, I covenant to follow the guideleines set forth in the Owners User Manual. Should I violate these Rules and/or abuse or damage my components, I understand that I must bear the expense to repair or replace the same in accordance with the Plans of Hammerland Utilities, Inc.

- I acknowledge Hammerland Utilities, Inc., its successors and assigns, have a perpetual easement in, over, under and upon the above specified land as shown on the property plat, with the right to operate and repair all components of the sewer system on my property, including but not limited to the septic tank and septic tank pump systems. I further grant Hammerland Utilities, Inc. permission to enter upon my property for any reason connected with the provision or removal of sewer service or collection therefore.
- 3. I understand that the electrical service for the septic tank pumping system shall be connected to the electrical service to my property and that I shall be providing the current for the operation of the pumps.
- 4. For all other plumbing and structures on the property, including the outfall line to the septic tank, I agree that I am responsible for all operation and repair thereof.
- I agree to promptly pay for service at the then current schedule or rates and fees and agree to abide by and be subject to Hammerland Utilities, Inc. billing and cutoff procedures. Should I not pay in accordance with Hammerland Utilities, Inc. rules, I agree to pay all costs of collection including attorney fees.
- 6. I accept the current Rules and Regulations and the Rates and Fees Schedule and agree to abide by any amendments to such Schedules.
- 7. I agree that this Agreement shall remain in effect for as long as I own, reside upon or rent the above-described property. When such circumstances no longer exist, I agree to provide notice to Hammerland Utilities, Inc. at least thirty (30) days in advance of my vacating the property.

CUSTOMER'S SIGNATURE

ATTACHMENT 2

OWNERS USER MANUAL

Dear Property Owner:

Your property is being provided sewage collection and treatment using the most modern biological system appropriate for homes in our community. No chemicals are used in our process and the highly treated sewage is disposed in a manner to be returned to the soil.

Located on your property shall be located a septic tank which will receive your domestic sewage. In the septic tank, an effluent screen or an effluent pump shall be installed to allow the liquid part of your waste stream to be transported to the sewage treatment system.

A properly maintained septic tank provides a high degree of treatment and yields an effluent that is relatively free of grease and solids that can clog the effluent. The best practice is not to discharge anything into a septic system that is poisonous or that may inhibit the abilities of the biologically functioning septic tank. A good rule of thumb should be to not discharge anything into the system that can not be ingested. This would not include toilet paper and mild detergents.

The performance of your biological sewer system is affected by the materials introduced into the system. The following is a summary of some of the items that are bad management and good management practices. A knowledgeable user can prevent premature failures and eliminate costly repairs.

Items that cause problems and failure of this system are:

- Garbage disposal use
- Excessive sludge or scum accumulation in septic tank
- Improper fabric softeners and whiteners
- Grease and oils from cooking and washing
- Hair
- Disposable and non-disposable diapers, rags, cigarette butts, coffee grounds, feminine hygiene products, plastic and rubber products, condoms, and chemical cleaners
- Any non-biologically degradable substances
- Water usage over design limits

The following management practices and recommendations should be followed:

GOOD MANAGEMENT PRACTICES

- Communicate with the operator or the operator's assistant (Operator) if anything about your system is out of the ordinary. Upon the first indication of a visual or audible alarm, call the operator.
- Contact Hammerland Utilities, Inc. prior to the installation of any new landscaping or the construction of permanent structures. It will be critical to coordinate any work to ensure that the integrity of the biological system and lines are protected.
- Maintain toilet bowl hardware so as to prevent leaky conditions and excess water use and waste.
- Collect grease in a container rather than pouring down the drain.
- Direct all sewage from the home into the septic tank.

POOR MANAGEMENT PRACTICES

- Don't connect rain gutters or storm drains or allow other surface water to get into your septic system.
- Don't use excessive quantities of water. Use water saving devices such as low flow shower heads and low volume flush toilets. Water conservation helps the system.
- Don't allow toilets to become a problem. Repair leaky toilets, faucets, or plumbing fixtures (leaky toilets can result in flows of 1,000 gallons or more per day).
- Don't dump recreational vehicle (RV) waste into your septic tank.
- Don't flush undesirable substances into the sewer. Flushing flammable and toxic products is a dangerous practice. Other materials such as paper towels, rags, newspaper, cigarettes, coffee grounds, egg shells, sanitary napkins, condoms, large amounts of hair, and cooking grease are a maintenance nuisance and will result in frequent pumping of septage from the tank.
- Don't use garbage disposal systems to dispose of non-biodegradable materials because they increase the amount of solids entering the septic tank and will increase the frequency required for septage pumping. <u>Do not</u> <u>pour grease down the drain.</u>

- Don't drain water softener backwash into the tank. The backwash brine
 contains high levels of chlorides that can destroy the balance of the
 biological system, affect soil performance, and break down components of
 the system. The brine solution also interferes with the solid's sedimentation
 that occurs in the tank.
- Don't use special additives in your tank. Additives do not improve the performance of the septic tanks and can cause major damage to other areas in the collection and treatment system.
- Don't flush cat litter box medium down the toilets.
- Do not dig without knowing the location of your septic and pump tank. Landscape the site to allow surface water to drain off of these tanks. Divert roof drains from these tanks. Standing water over these tanks will cause increased load saturations and potential pump failure.
- Do not park or drive over the septic and pump tank. This can damage or compromise the tank.
- Do not enter your septic or pump tank. Gases from inside the tank can be fatal. Keep the lids secure and screwed down.
- Do not turn off the main circuit breaker to the waste water pumps when going on vacation. The pumps will need to handle any infiltration into the system.

Customer Service: 731-

20c. Resume's and Certifications.

Pam Bygden

Randy Stamps

Terry G. Wimberly

Pamela L. Bygden

pambygden@gmail.com • 8828 New Hope Rd. Big Sandy, TN 38221• 731-336-4034

Education

Eastern High School, Middletown, KY Graduated 1976

Riverside School of Heath Careers, Newport News, VA Attended 1977-1979 Medical Transcriptionist

Real Estate Affiliate Broker License, FL Obtained 1992 Retired 2004

Real Estate Salesperson License, TN
Obtained February 2005
Upgraded to Broker in September 2007
Upgraded to Principal Broker in December 2010
Currently Active

Skills

- Certified Mediator with the Board of Realtors
- Proficient in Microsoft Word and Excel
- Proficient in Quick Books, multiple versions
- Excellent time management and problem solving capabilities
- Customer Service oriented
- Strong work ethic, organizational abilities and analytical aptitude
- Extensive knowledge of real estate principles and practices demonstrated with over 800 continuing education hours obtained from 1992 to present

Experience

Lake Associates, Inc., REALTORS® Buchanan, TN Principal Broker *December 2010* – Present Office Manager/Licensed Salesperson *February 2005* - December 2010 Office Manager *October 2003* -February 2005

- Manages all operations in the Real Estate firm
- Supervises all real estate agents

* * 4

- Responsible for all accounts payable, accounts receivables, training, advertising, marketing and customer relations
- Ensures that all documents and contracts are in compliance with state law

Tennessee Valley Association of REALTORS®, Paris, TN Chief Executive Officer *January* 2000- January 2004

- Supported 120 local real estate agents
- Facilitated all new agent training, continuing education classes and board meetings
- Liaison between local board members and state and national associations
- Responsible for accounts payable and receivables
- Resolved all customer relation issues between board members and the public

Hudson Moredock Realtors/Appraisers, Winter Park, FL

Office Manager/Affiliate Broker October 1989- December 1998

- Supervised all real estate agents and appraisers
- Responsible for all accounts payable, accounts receivables, training and customer relations
- Ensured that all documents and contracts are in compliance with state law
- Prepared appraisal reports for mortgage companies
- Coordinated all real estate closings

Circle K Corporation Winter Park, FL

Assistant Office Manager/ Account Payable Supervisor/

Executive and Administrative Assistant February 1984- October 1989

- Supervised 20 office staff members
- Ensured calculation accuracy of 135 convenience stores daily receipts, gasoline inventory and payables
- Supervised 6 maintenance personnel
- Responsible for accounts payable and receivable for the district office
- Developed marketing strategies
- Handled employee Workman's Compensation Claims

References

Available upon request

Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222 (731) 642-1399

March 31, 2014

Mr. Wade Murphy, Permits Section
Department of Environment and Conservation
Division of Water Resources – Tennessee Tower
312 Rosa L. Parks Ave., 11th Floor
Nashville, Tennessee 37343-1102

RE: River Trace II Waste Water Treatment Stewart County, Tennessee SOP – 13030, Job No. D-202

Dear Mr. Murphy:

In response to the concerns regarding the operation of the financial aspect of Hammerland Utilities, Inc., please be advised that as Secretary of the Corporation, and over 30 years accounting and managerial experience, I will be managing the day to day operations of the company.

Mr. Charles Simon, who is an accountant and also a Director of the Corporation, will receive monthly reports. Mr. Jerry Smith, a local Certified Public Accountant, is available for any questions and will also be completing the corporate tax returns.

Please let me know if you have any additional questions regarding this issue.

Sincerely,

Pamela L. Bygden Secretary

cc: File

Randy Gene Stamps 5511 Elkhorn Nobles Road Springville, TN 38256

rgstamps71@hotmail.com

Home: 731-642-8373 Mobile: 731-676-0055 Work: 731-642-1399 Fax: 731-642-1459

WORK HISTORY

1993-Present <u>Lake Associates, Inc./Bass Morgan Investments/Premier Homes, LLC</u>

6471 E. Antioch Road, Buchanan, TN 38222 (All companies have same management/owners)

Real Estate Affiliate Broker – Perform all aspects of real estate transactions to include contract negotiations, surveys, boundary line disputes, TVA boat dock permits, research deeds, prepare advertising materials for local and national publications. Project manager for commercial property development. Million dollar sales club for the past 9 years.

<u>Branch Manager</u> – New home construction office; prepared cost estimates for customers, site planning, supervised office personnel.

2005-2009 Ponderosa Tree Farm

8828 New Hope Road, Big Sandy, TN 38221

<u>Farm Manager</u> – Manage farm (640 acres) for owners to improve wildlife habitat for whitetail deer, turkey and quail. Plant food plots, stock ponds, bush hogging, erosion control for roads attacar (en al.

control for roads, stream/creek management

1991-1993 Wackenhut of Alaska, Inc

Anchorage, AK

<u>Security Officer/Emergency Medical Technician</u> – Security for local airport, main living camp. Other duties included dispatcher, fire control safety, public relations with native Alaskans, patrol of oil fields. Answered ambulance calls, maintained inventory on

ambulance vehicles.

1986-1991 Paris Police Department

100 N. Caldwell Ave., Paris, TN 38242

<u>Patrolman I</u> – Enforcement of State and City laws within the city of Paris. Arrest and transport prisoners, fingerprinting. Traffic accident investigation and reports. Train new officers, dispatch on station radio, attend and prepare cases for court, issue traffic

citations, conduct seminars at local schools.

1984-1985 <u>Martin Mechanical Contractors</u>

Buchanan, TN 38222

(Worked here during temporary layoff times at Midland Brake)

<u>Plumbing Technician</u> – Assisted in residential and commercial plumbing and electrical maintenance, installed circuit breakers, replaced hot water tanks, installed new sewer lines, repaired broken or frozen pipes.

1978 – 1986 <u>Midland Brake</u>

Reynoldsburg Road, Paris, TN 38242

<u>Machinist</u> – Supervised and trained new employees in company policies and procedures and machine operation. Job included: machine set up, reading blueprints, quality control for finished parts.

VOLUNTEER WORK

 $\underline{Cross\ Creeks\ National\ Wildlife\ Refuge,\ Dover,\ TN}-Once\ yearly\ presentation\ to\ 9-12\ year\ old\ children\ on\ the\ habits\ and\ hunting\ of\ wild\ turkeys.}$

<u>Land Between the Lakes US Forest Service, Golden Pond, KY – Public relations with campers general maintenance around the campground</u>

<u>Tennessee Conservation League, Nashville, TN –</u> Land Between the Lakes Bald Eagle Hacking Program; feed and monitor young bald eagles in the park

Benton County Forestry Association, Camden, TN- Presentation to members on turkey hunting, calling, habitat management

EDUCATION AND TECHNICAL TRAINING

Formal Education:

Henry County High School, Paris, TN graduate 1977 Murray State University, Murray, KY 1977-1978 Colorado State University, Ft. Collins, CO, various courses

Technical & Specialized:

Wildlife Law Enforcement
State of Tennessee Real Estate Pre-Licensing
Practical Real Estate Finance
Selling New Homes Workshop
Environmental Considerations in Real Estate
Introduction to Commercial Real Estate
The Truth About Mold
Computer Techniques for MLS
Real Estate Ethics

<u>REFERENCES</u>

Gail Wilson Regions Bank Branch Manager 931-232-5326 Gail.wilson@regions.com

Mr. Steve Greer Greer & Greer Attorneys Attorney - Paris, TN 731-642-8781 stevegreer@bellsouth.net

Mr. William Johnson Boca Raton, FL Director, Proprietary Trading, Noble Financial Group 954-415-4727 Billyj1624@gmail.com

Mr. Donnie Adams Earl Spencer Lane, Erin, TN Retired TVA Boilermaker Supervisor 931-289-3332 Emergency Medical Technician
The Lender REALTOR® Connection
Marketing Strategies for New Homes
Red Flags Home Inspection
Buyer Representation in Real Estate
Diversity & Doing Business
Understanding 1031 Tax Free Exchanges
Risk Reduction – Drafting Contract Clauses

Mr. Richard Hines
Dover, TN
Manager-Cross Creeks National Wildlife Refuge
931-232-7477
Richard_hines@fws.gov

Mr. Keith Hickman Buchanan, TN Primos Pro Staff/Golf Pro-Paris Landing State Park 731-641-4459 Keith.hickman@tn.gov

Ms. Pamela Bygden Big Sandy, TN Land Owner-Ponderosa Tree Farm 731-593-5678 pambygden@gmail.com

TERRY G. WIMBERLEY

325 Somerset Drive Paris, TN 38242 731-407-4113

Cell Phone: 731-336-9326 E-mail: tgwimberley@parisbpu.org

EXPERIENCE	Board of Public Utilities Paris TN	August 2003- Present		
Director of Water & Wastewater Operations	 Responsible for drinking water productio Responsible for wastewater collection and 	wenty-three employees in three different facilities ble for drinking water production and distribution operations ble for wastewater collection and treatment operations \$1.8 million budgets in water and wastewater departments		
	Sulphur Well Church of Christ Springville, TN	May 1997-August 2003		
Associate Minister	Primary role included organizing and conducting activities as well as working with teens and college age students numbering around 100.			
	Other responsibilities included: - Organizing, delegating, and following-up - Making business related decisions within - Performing various administrative tasks	with adult volunteers. church office		
	Board of Public Utilities D Paris, TN	ecember 1990-April 1997		
Assistant Project Manager		l engineering department mapping, and record ithin electric sting program for		
Project	 Paris, TN Assisted with all projects within electrical including design, maintenance, planning, keeping. Performed most computer related tasks widepartment Implemented and administrated a drug-test employees Educated community and specifically study 	l engineering department mapping, and record ithin electric sting program for dents in local ing Technology from Murray		

SPECIAL
TRAINING
State of Tennessee certifications: Grade II Wastewater Collections
Grade IV Wastewater Treatment
Grade II Water Distribution

REFERENCES
Mr. John Etheridge, General Manager, Board of Public Utilities,

731-642-1322

Mr. Carl Holder, City Manager, City of Paris, TN 731-641-1408

State of Cennessee

Department of Environment and Conservation



Vater and Bastebater Operator Certification Board

Issues This

Certificate of Competency

as Testimony That

Terry G. Wimberley

has satisfactorily fulfilled the requirements set forth by the

Water and Wastewater Operator Certification Board

and is therefore, by these presents, entitled to recognition as a

Grade IV Wastewater Treatment Plant Operator

In Witness Whereof, we have subscribed our names and affixed our Seal

Attest W. David Draughon, In.

Soard Secretary

Recommended Board Commissioner.

November 06, 2008

Certificate No. ******* Dated

CN-075

INDEPENDENT CONTRACTOR AGREEMENT

This agreement is between Hammerland Utilities, Inc. (the Company) and Terry Wimberley (The Operator) for the Operator to provide the services for the Company at the facility known as River Trace II Septic system, River Trace Drive, Dover, Tennessee.

For the contract amount of \$300.00 per month, the Operator will perform the following tasks on a scheduled once monthly basis, commencing when the plant construction has completed and is operating:

1. Operate the sewage treatment plant

- 2. Do required tests required by the Tennessee Department of Environment and Conservation.
- 3. Send reports to the Tennessee Department of Environment and Conservation
- 4. Perform inspections and report any maintenance issues immediately to the Corporate office

Copies of all test results and correspondence with the State shall be provided to the corporate office located at 6471 E. Antioch Road, Buchanan, Tennessee 38222.

Each party has the right to terminate this agreement with a 60 (sixty) day written notice provided to the other.

Signed by:

Terry Wimberley, Operator

Date

Pamela L. Bygden, Socretary

Date

20d. Letter of Credit.

TENNESSEE REGULATORY AUTHORITY

PUBLIC UTILITY SERVICE PROVIDER'S SURETY BOND

Bond #: 106111696

WHEREAS, _Hammerland Utilities, Inc. ("Principal") is a wastewater public utility and holds a Certificate of Public Convenience and Necessity ("CCN") granted by the Tennessee Regulatory Authority, an agency of the State of Tennessee, for the provision of wastewater utility services in Tennessee; and

WHEREAS, under the provisions of Title 65, Chapter 4, Section 201(e) of the Tennessee Code Annotated, as amended, and Tenn. Comp. R. & Regs. Chapter 1220-4-13, the Principal is required to file this bond to secure the payment of any monetary obligation imposed in any enforcement proceeding brought under Title 65 Chapter 2, 4 and 5 of the Tennessee Code Annotated, or Tenn. Comp. R. & Regs. Chapter 1220-4-13, by or on behalf of the Tennessee Regulatory Authority (the "TRA"); and

WHEREAS, _Traveler's Casualty and Surety Company of America ("Surety"), a corporation licensed to do business in the State of Tennessee and duly authorized by the Tennessee Commissioner of Insurance to engage in the surety business in Tennessee pursuant to Title 56, Chapter 2 of the Tennessee Code Annotated, has agreed to issue this bond in order to permit the Principal to comply with the provisions of Title 65, Chapter 4, Section 201 of the Tennessee Code Annotated and Tenn. Comp. R. & Regs. Chapter 1220-4-13;

NOW THEREFORE, BE IT KNOWN, that we the Principal and the Surety are held and firmly bound to the STATE OF TENNESSEE, in accordance with the provisions of Tennessee Code Annotated, Title 65, Chapter 4, Section 201(e) and Tenn. Comp. R. & Regs. Chapter 1220-4-13 in the full amount of Twenty Thousand Dollars and 00/100's (\$20.00.00) lawful money of the United States of America to be used for the full and prompt payment of any monetary obligation imposed against the Principal, its representatives, successors or assigns, in any enforcement proceeding brought under Title 65 Chapters 2, 4 and 5 of Tennessee Code Annotated, or Tenn. Comp. R. & Regs. Chapter 1220-4-13, by or on behalf of the TRA, for which obligation we bind ourselves, our representatives, successors and assigns, each jointly and severally, firmly and unequivocally by these presents.

This bond shall become effective on the _09/04/2014 and shall be continuous; provided, however, that each annual renewal period or portion thereof shall constitute a new bond term. Regardless of the number of years this bond may remain in force, the liability of the Surety shall not be cumulative, and the aggregate liability of the Surety for any and all claims, suits or actions under this bond shall not exceed Twenty Thousand Dollars and 00/100's (\$20,000.00). The Surety may cancel this bond by giving sixty (60) days advance written notice of such cancellation to the Tennessee Regulatory Authority and the Principal by certified mail, it being understood that the Surety shall not be relieved of liability that may have accrued under this bond prior to the date of cancellation.

PR		

Hammerland Utilities, Inc.

Name of Wastewater Public Utility

6471 E. Antioch Road, Buchanan, TN 38222

Address of Principal

SIGNATURE OF PRINCIPAL

Name: Title: SURETY

Traveler's Casualty and Surety Company of America

Name of Surety

1 Tower Square, Hartford, CT 06183

Address of Surety

SIGNATURE OF SURETY AGENT

Name: William Reidinger

Title: Attorney-In-Fact

Address of Surety Agent:

Assurance Agency, Ltd. 1750 E. Golf Road

Schaumburg, IL 60173

THIS BOND IS ISSUED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 201, CHAPTER 4, TITLE 65 OF THE TENNESSEE CODE ANNOTATED AND TENN. COMP. R. & REGS. CHAPTER 1220-4-13. SHOULD THERE BE ANY CONFLICT WITH THE TERMS HEREOF AND THE STATUTE OR REGULATIONS PROMULGATED THEREUNDER, THE STATUTE OR REGULATIONS SHALL PREVAIL. (POWER OF ATTORNEY FROM AN APPROVED INSURANCE COMPANY MUST BE ATTACHED.)

ACKNOWLEDGMENT OF PRINCIPAL

ILLINOIS		
STATE OF TENNESSEE		
COUNTY OF DUPAGE		
Before me a Notary Public of the State and	Comp. 6 11 11 11 11 11 11 11 11 11 11 11 11 1	
with whom I am personally acquainted and w	County aforesaid, personally appeared KENNETH 3	. LAHNI
the foregoing bond on behalf of HAMMERLAND U-	who, upon oath, acknowledged himself to be the individual will the state and he acknowledged to me that he executed	ho executed
		ine same.
WITNESS my hand and seal this 8th day	y of SEPTEMBER, 2014.	
My Commission Expires:		
COMMISSION OF ALL	7 2/4	
ERIC H. LARSON 20	Cut to mion	
NOTARY PUBLIC, STATE OF ILLINOIS	Notary Public	
MY COMMISSION EXPIRES 04/27/18 \$		
ACKNOWLEDGM	MENT OF SURETY	
STATE OF Illinois		
COUNTY OF Kane		
TEATING TO THE PROPERTY OF THE		
state pursuant to Title 56, Chapter 2 of the Tennessee (America the within named Surety, a corporation licensed to do nessee Commissioner of Insurance to engage in the surety busi Code Annotated, and that he as such an individual being author of the corporation by himself and as such individual.	
WITNESS my hand and seal this 4th day of So		
My Commission Expires:	1 8 1000	
10/07/0014	Small D	
10/07/2014	7 1104 1 400	
	Donna M. Tyler, Notary Public	
APPROVAL AND	INDORSEMENT	
Chic is to sawle along the		
Sureties on the same are good and worth the penalty the Authority, State of Tennessee, this day	nd and found the same to be sufficient and in conformity to la nereof, and that the same has been filed with the Tennessee F of 20	w, that the Regulatory
	The second secon	

Title:

WARNING: THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and scaled with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Vice President, any Senior Vice President, any Vice President, any Senior Vice President, any Senior Vice President, any Vice President, any Senior Vice P

I. Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, Travelers, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been reveked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this

4

Kevin E. Hughes, Assistant Secretary



















To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at www.travelersbond.com. Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.



POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St. Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company Travelers Casualty and Surety Company Travelers Casualty and Surety Company of America United States Fidelity and Guaranty Company

Attorney-In Fact No.

226623

Certificate No. 005811031

KNOW ALL MEN BY THESE PRESENTS: That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Donna M. Tyler, Hina Azam, Karen E. Bogard, William Reidinger, Donna Wright, Joseph Halleran, Matthew V. Buol, and Rebecca R. Alves

of the City of	Schaumburg		. State of	Illinois		their term and less	
other winnings our	agmory in the natur	re thereof on behalf	above, to sign, execut	e, seal and acknowle	aranteeing the fideli	ds, recognizances, condi	ful Attorney(s)-in-Fact, tional undertakings and ing the performance of
IN WITNESS W	HEREOF, the Con	npanies have caused	I this instrument to be	signed and their corr	orate seals to be he	reto affixed this	21st
day of Febru	ary	, 2014			- 123		
	Fi Fi St	delity and Guaran . Paul Fire and Ma	y Company ity Jusurance Compa ity Insurance Underv arine Insurance Com insurance Company	vriters, Inc.	Travelers Casi Travelers Casi	ury Insurance Compan ualty and Surety Comp ualty and Surety Comp Fidelity and Guaranty	any any of America
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State of Connectic City of Hartford s				Ву:	Robert	L. Rancy, Senior Vice Presi	ident
Casualty and Sure	President of Farmin asurance Company, ety Company of Am	ngton Casualty Com St. Paul Guardian I erica, and United S	DEHITABLE Company V	t. Paul Mercury Insurante Co	mpany, Fidelity and rance Company, Tra	Robert L. Raney, who ac Guaranty Insurance Und veclers Casualty and Sur- ing authorized so to do, officer,	ierwriters, Inc., St. Paul
In Witness Where My Commission e	eof, I hereunto set n expires the 30th day	ny hand and official of June, 2016.	seal.	是	- γ	C. Tetreault, No.	Streault otary Public

58440-8-12 Printed in U.S.A.

20e. Copy of SOP Application.

Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222 (731) 642-1399

March 28, 2014

Mr. Wade Murphy, Permits Section
Department of Environment and Conservation
Division of Water Resources – Tennessee Tower
312 Rosa L. Parks Ave., 11th Floor
Nashville, Tennessee 37343-1102

RE: River Trace II Waste Water Treatment Stewart County, Tennessee SOP – 13030, Job No. D-202

Dear Mr. Murphy:

In response to the concerns stated by the Tennessee Regulatory Authority, we are dividing our operations into an entity for development (Hammerland, Inc.), and an entity for waste water treatment (Hammerland Utilities, Inc.).

Please consider this letter a request to amend the above application for a State Operating Permit to be in the name of Hammerland Utilities, Inc.

If you have any questions, please call.

Sincerely

Pamela L. Bygden

Secretary

cc: CE Designers

File

Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222 (731) 642-1399

March 31, 2014

Mr. Wade Murphy, Permits Section
Department of Environment and Conservation
Division of Water Resources – Tennessee Tower
312 Rosa L. Parks Ave., 11th Floor
Nashville, Tennessee 37343-1102

RE: River Trace II Waste Water Treatment Stewart County, Tennessee SOP – 13030, Job No. D-202

Dear Mr. Murphy:

In response to the concerns regarding the operation of the financial aspect of Hammerland Utilities, Inc., please be advised that as Secretary of the Corporation, and over 30 years accounting and managerial experience, I will be managing the day to day operations of the company.

Mr. Charles Simon, who is an accountant and also a Director of the Corporation, will receive monthly reports. Mr. Jerry Smith, a local Certified Public Accountant, is available for any questions and will also be completing the corporate tax returns.

Please let me know if you have any additional questions regarding this issue.

Sincerely,

Pamela L. Bygden Secretary

cc: File



Tennessee Department of Environment and Conservation Division of Water Pollution Control 401 Church Street, 6th Floor L & C Annex Nashville, TN 37243-1534 (615) 532-0625

APPLICATION FOR A STATE OPERATION PERMIT (SOP)

	Type of application:	New Permit	Permit Reissuance	Permit Mod	ification
Permittee Ide	entification: (Name	of city, town, indus	try, corporation, indiv	idual, etc., ap	oplying, according to
the provisions	of Tennessee Code	Annotated Section	69-3-108 and Regulat	ions of the Te	ennessee Water Quality
Control Board					
Permittee					
Name	River Trace II Ho	meowners Associa	tion		
(applicant):	- 4044044				
Permittee	(451 E. A41 L. D.	and Dunkanan T	20222		
Address:	64/1 E. Antioch R	Road, Buchanan, T	ennessee 36222		
		3-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1			
Official Conta	ict:		Title or Position:		
Pam Bygden			Secretary		
Mailing Addre	ess:		City:	State:	Zip:
6471 E. Antio	och Road		Buchanan	TN	38222
Phone number	` /		E-mail:		
731-642-1399			pambygden@gma	il.com	
Optional Con	tact:		Title or Position:		
Address:			City:	State:	Zip:
Traditoss.				~	r·
Phone numbe	r(s):		E-mail:		
			ance with the requirer	A CONTRACTOR OF THE SAME AND A SA	
The second of th					under my direction or
					properly gathered and
evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or					
	those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for				
					•
	e; print or type	uding the possibility	of fine and imprison Signature	ment for kno	Date
ivallie and titl	e, print or type		Signature	0/1	Date
Pan Bygden,	Secretary	(Smile &	goden	September 3, 2013
Jenens	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~			1/1	optomot o, 2015

SOP APPLICATION – page 2

Permit Number: SOP-____

Facility Identi	fication:		rmit No.	
Facility Name:	River Trace II WWTP	Co	ounty:	Stewart
Facility		17572000	titude:	36-26-18N
Address or Location:	Address or River Trace Road, Stewart County, Tennessee			88-01-44W
Name and dista	ance to nearest receiving waters	s: 1000 ft to Tennessee River(Kentuck	y Lake)	
numbers:		er Permits have been obtained for this si		
Name of comp Association	any or governmental entity that	t will operate the permitted system: Rive	er Trace I	I Homeowners
Operator addre	ess: 6471 E. Antioch Road	, Buchanan, Tennessee 38222		
the Tennessee treatment system If the applicant how and when the contract for Complete the wastewater floor.	Regulatory Authority (TRA) (rems)? Yes No N/A t listed above does not yet own the ownership will be transfer operations. following information explainow:	of Convenience & Necessity (CCN), or may be required for collection systems a the facility/site or if the applicant will need or describe the contractual arrangem	nd land ap not be the cent and re	opplication operator, explain newal terms of d daily design
Entity Ty		of Design Units		Flow (gpd)
City, town county	of two. of connections.			
	n No. of homes: 50	Avg. No. bedrooms per home: 3		15000
School	No. of students:	Size of cafeteria(s): No. of showers:		
Apartment	No. of units:	No. units with Washer/Dryer hook No. units without W/D hookups:	ups:	
Commerci Business	al No. of employees:	Type of business:		
☐ Industry	No. of employees:	Product(s) manufactured:		
Resort	No. of units:			
☐ Camp	No. of hookups:			
RV Park	No. of hookups:	No. of dump stations:		
Car Wash	No. of bays:			
Other				
Describe the t	ype and frequency of activities	that result in wastewater generation.		
Continous	Home Occupancy			

CN 1251 (Rev. 01-12)

SOP APPLICATION – page 3

Permit Number: SOP-____

Engineering Report (required for	collection systems and/or	land appl	ication treatment	□ N/A	
systems):					
Prepared in accordance with Rule	e 1200-4-203 and Section	1.2 of the	Tennessee Design C	riteria (see	
website for more information)					
Attached, or					
Previously submitted and entitled	l:	Approved	? Yes. Date:	∐ No	
Wastewater Collection System:				□ N/A	
System type (i.e., gravity, low pressu	re, vacuum, combination,	etc.): Low	Pressure Gray Water	Only	
System Description: Recirculating Sa	and Filter w/ Drip Field				
Describe methods to prevent and resequipment failures, heavy rains, etc.				failures,	
In the event of a system failure description operater	ribe means of operator not	fication: S	ystem alarms and pho	one alert to	
List the emergency contact(s) (name	e/phone): Randy Stamps 7	31-642-13	99		
For low-pressure systems, who is res		of STEP/S	TEG tanks and pump	s or grinder	
pumps (list all contact information)?	-				
Contact: Randy Stamps @ 731	-642-1399				
Approximate length of sewer (exclude	ding private service lateral): 6000 lf			
Number/hp of lift stations: /	Numb	er/hp of li	ft pumps /		
Number/volume of low pressure and or grinder pump tanks 50 lp units/					
Number/volume septic tanks 50 p times 50 april tanks 50 april tanks					
Attach a schematic of the collection system. Attached					
If this is a satellite sewer and you are tying in to another sewer system complete the following section, listing					
tie-in points to the sewer system and					
Tie-in Point	Latitude (xx.xxxx		Longitude (xx.xxxx°)	

SOP APPLICATION - page 4

Permit Number: SOP-____

Land Application Treatment System:	□ N/A
Type of Land Application Treatment System: Drip Spray Other, explain:	
Type of treatment facility preceding land application (recirculating media filters, lagoons, other	r, etc.):
Recirculating Sand Filter	
Attach a treatment schematic. Attached	
Describe methods to prevent and respond to any bypass of treatment or discharges (i.e., power	failures,
equipment failures, heavy rains, etc.): Holding flow in proposed recirculation tank	
For New or Modified Projects:	
Name of Developer for the project: Hammerland, Inc. Attn: Pam Bygden	20 701 (40
Developer address and phone number: 6471 E. Antioch Road, Buchanan, Tennessee 382 1399	22, 731-642-
For land application, list: Proposed acreage involved: 1.66	
Inches/week gpd/sq.ft loading rate to be applied: 2.34 in/wk 0.2	08 gpd/sf
Is wastewater disinfection proposed?	
Yes Describe land application area access: Off River Trace Road at WWTP Site	
No Describe how access to the land application area will be restricted:	
Attach required additional Engineering Report Information (see website for more information)	nation)
Topographic map (1:24,000 scale presented at a six inch by six inch minimum size) showing the state of the st	desimal degrees
the project including quadrangle(s) name(s) GPS coordinates, and latitude and longitude in should also be included.	decimal degrees
Scaled layout of facility showing the following: lots, buildings, etc. being served, the waste	ewater collection
system routes, the pretreatment system location, the proposed land application area(s), road	s, property
boundaries, and sensitive areas such as streams, lakes, springs, wells, wellhead protection a	reas, sinkholes
and wetlands.	
Soils information for the proposed land disposal area in the form of a Water Pollution Con	trol (WPC) Soils
Map per Chapter 16 and 17 State of Tennessee Design Criteria for Sewage Work. The soil	s information
should include soil depth (borings to a minimum of 4 feet or refusal) and soil profile descrip	ption for each soil
mapped.	
Topographic map of the area where the wastewater is to be land applied with no greater th	an ten foot
contours presented at a minimum size of 24 inches by 24 inches.	** ** *** ***
Describe alternative application methods based on the following priority rating: (1) connections the following priority rating: (1) connections and provide the following priority rating: (1) connections and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the following priority rating: (1) connections are also as a first and provide the first and provide the following priority rating: (1) connections are also as a first and provide the first and pr	CHOIN TO B
municipal/public sewer system, (2) connection to a conventional subsurface disposal system	n as regulated by
the Division of Groundwater Protection, and/or (3) land application.	

CN 1251 (Rev. 01-12) RDA 2366

SOP APPLICATION - page 5

Permit Number: SOP-____

	Real control of the second
For Drip Dispersal Systems Only: Unless otherwise determined by the Department, sewage treatment effluent wells, i.e, large capacity treatment/drip dispersal systems after approval of the SOP Application, will be issued an UIC tracking number and will be authorized as Permit by Rule per UIC Rule 1200-4-614(2) and upon issue of a State Operating Permit and Sewage System Construction Approval by the Department.	□ N/A
Describe the following: The area of review (AOR) for each Drip Dispersal System shall, unless otherwise specified by	the Department
consist of the area lying within a one mile radius or an area defined by using calculations unde the Drip Dispersal System site or facility, and shall include, but not be limited to general su- features, general subsurface geology, and general demographic and cultural features within the this part of the application a general characterization of the AOR, including the following: narrative form)	r 1200-4-609 of arface geographic e area. Attach to this can be in
A general description of all past and present groundwater uses as well as the general ground direction and general water quality.	dwater flow
A general description of the population and cultural development within the AOR (i.e. agric commercial, residential or mixed)	
Nature of injected fluid to include physical, chemical, biological or radiological characteris	tics.
 ✓ If groundwater is used for drinking water within the area of review, then identify and located topographic map all groundwater withdrawal points within the AOR, which supply public of water systems. Or supply map showing general location of publicly supplied water for the area obtained from the water provider) ✓ If the proposed system is located within a wellhead protection area or source water protection. 	r private drinking rea (this can be
designated by Rule 1200-5-134, show the boundary of the protection area on the facility si	te plan.
Description of system, Volume of injected fluid in gallons per day based upon design flow monitoring wells	, including any
Nature and type of system, including installed dimensions of wells and construction material	als
Pump and Haul:	⊠ N/A
Reason system cannot be served by public sewer:	
Distance to the nearest manhole where public sewer service is available:	
When sewer service will be available:	
Volume of holding tank: gal.	
Tennessee licensed septage hauler (attach copy of agreement):	
Facility accepting the septage (attach copy of acceptance letter):	
Latitude and Longitude (in decimal degrees) of approved manhole for discharge of septage:	0.11
Describe methods to prevent and respond to any bypass of treatment or discharges (i.e., power equipment failures, heavy rains, etc.):	r tailures,

SOP APPLICATION – page 6

Permit Number: SOP-____

Holding Ponds (for non-domestic wastewater only):	⊠ N/A
Pond use: Recirculation Sedimentation Cooling Other (describe):	
Describe pond use and operation:	
If the pond(s) are existing pond(s), what was the previous use?	
Have you prepared a plan to dispose of rainfall in excess of evaporation? Yes No	
If so, describe disposal plan:	
Is the pond ever dewatered? Yes No	
If so, describe the purpose for dewatering and procedures for disposal of wastewater and/or	sludge:
Is(are) the pond(s) aerated? \[Yes \] No	
Volume of pond(s): gal. Dimensions:	
Is the pond lined (Note if this is a new pond system it must be lined for SOP coverage. Otherwapply for an Underground Injection Control permit.)? Yes No	ise, you must
Describe the liner material (if soil liner is used give the compaction specifications):	
Is there an emergency overflow structure? Yes No	
If so, provide a design drawing of structure.	
Are monitoring wells or lysimeters installed near or around the pond(s)? Yes No	
If so, provide location information and describe monitoring protocols (attach additional sh necessary):	neets as

SOP APPLICATION - page 7

Permit Number: SOP-____

Mobile Wash Operations:	☑ N/A
☐ Individual Operator	Fleet Operation Operator
Indicate the type of equipment, vehicl	e, or structure to be washed during normal operations (check all
that apply): Cars Trucks Trailers (Interior washing of dump-tranks, is prohibited.) Other (describe): Wash operations take place at (check Car sales lot(s) Private industry lot(s) County(ies), list:	Parking Lot(s): sq. ft. Windows: sq. ft. ailers, or Structures (describe):
Wash equipment description:	Statewide
☐ Truck mounted ☐ Rinse tank size(s) (gal.): ☐ Collection tank size(s) (gal.): Pressure washer: psi (rated) ☐ gas powered Vacuum system manufacturer/model: Describe any other method or system us	are permitted or have written permission to discharge waste wash water
Are chemicals pre-mixed, prior to arriv	
	r chemicals used in the wash operation (attach additional sheets as
Chemical name:	Manufacturer: Primary CAS No. or Product No.

APPLICATION FOR A STATE OPERATION PERMIT (SOP) INSTRUCTIONS

<u>Purpose of this form</u> A completed SOP application must be submitted to obtain SOP coverage. This permit is required to operate a sewage, industrial waste or other waste collection and/or treatment system that does not have a point source discharge to any surface or subsurface waters. This form must be submitted at least 180 days before starting any new activity, before an existing permit expires, or when renewing a permit.

Complete the form Type or print clearly, using black or blue ink; not markers or pencil. Answer each item or enter "N/A," for not applicable. If you need additional space, attach a separate piece of paper to the SOP application. Applicants may be required to submit engineering reports, plans and specifications. Contact the division for the applicable items, or visit the Division of Water Pollution Control world wide web site at: http://www.tn.gov/environment/wpc for more information. The application will be considered incomplete without supplying all of the required information, Engineering Reports, and an original signature.

<u>Permittee Identification/Facility Identification</u> Describe and locate the project, use the legal or official name of the facility or site. Provide the latitude and longitude (expressed in decimal degrees) of the center of the site, which can be located on USGS quadrangle maps. The quadrangle maps can be obtained at 1-800-USA-MAPS, or at the Census Bureau world wide web site: http://www.census.gov/cgi-bin/gazetteer. Attach a copy of a portion of a 7.5 minute quad map, showing location of site, with boundaries at least one mile outside the site boundaries. If business is mobile give the owner of operations' home, or business office address, and list all current areas of operation by city and county.

<u>Wastewater Collection System</u> These types of systems require engineering reports, refer to the website (http://www.tn.gov/environment/wpc/) for more information.

<u>Land Application Treatment System</u> These types of systems require engineering reports, refer to the website (http://www.tn.gov/environment/wpc/) for more information. Public access to the treatment area must be restricted, if disinfection is not part of the treatment. Applicants completing this section of the application must also complete the Wastewater Collection System section.

<u>Pump and Haul</u> These types of systems may require engineering reports, refer to the website (http://www.tn.gov/environment/wpc/) for more information.

Holding Ponds Given that annual rainfall onto open ponds exceeds annual evaporation (in Tennessee), the permittee must develop a written plan (to be retained on site and be available to the division upon request) that addresses how excess rainfall will be disposed of in compliance with the no discharge requirement of this permit. Treatment ponds are not to be used for stormwater treatment or storage. All new and existing point source industrial stormwater discharges associated with industrial activity require coverage under the Tennessee industrial stormwater multi-sector general permit TMSP, refer to the website (http://www.tn.gov/environment/permits/strmh2o.shtml) for more information. Describe the system for rerouting surface runoff away from ponds in the rainfall disposal plan.

Mobile Wash Operations Indicate whether the operation is run by an individual or a corporation with a fleet of vehicles equipped to wash and collect waste waters. If a corporation, indicate the home office as the "Official Contact". Indicate if operations take place at specific sites and list those counties that apply. Note that this permit covers operations for all of Tennessee. Operations indicated as "statewide" generally apply as a fleet type operation and each office location shall be individually permitted. Equipment may be truck or trailer-mounted, or both, indicate all that applies. Soaps, detergents, and other chemicals used should be non-toxic and biodegradable. All "chemically enhanced" (soaps, detergents, and other chemicals) waste-wash waters must be collected for proper disposal. If no chemically enhanced washwaters are used, clear-wash waters may travel by sheet flow to a gravel or grassy area where there is no opportunity to enter waters of the

APPLICATION FOR A STATE OPERATION PERMIT (SOP) INSTRUCTIONS - CONTINUED

state. There should be no discharge to a storm water inlet, ditch, conveyance, stream, etc. If you are unsure of your wash area drainage, contact the area Environmental Field Office (EFO) prior to setting up your wash operation.

<u>Fees</u> There is no application fee for this permit. An annual maintenance fee is required and you will be invoiced at a later date.

<u>Submitting the form and obtaining more information</u> Note that this form must be signed by the chief executive officer, owner, or highest ranking elected official. For more information, contact your local EFO at the toll-free number 1-888-891-8332 (TDEC). Submit <u>three</u> complete applications (keep a copy for your records) to the appropriate EFO for the county(ies) where the facility is located, addressed to **Attention: WPC, Permit Section Manager**.

EFO	Street Address	Zip Code	EFO	Street Address	Zip Code
Memphis	2510 Mt. Moriah Road STE E-645	38115- 1520	Cookeville	1221 South Willow Ave.	38506
Jackson	1625 Hollywood Dr	38305- 4316	Chattanooga	540 McCallie Avenue STE 550	37402- 2013
Nashville	711 R S Gass Boulevard	37243	Knoxville	3711 Middlebrook Pike	37921
Columbia	2484 Park Plus Drive	38401	Johnson City	2305 Silverdale Road	37601

Upon receipt of the required items, the division conducts a review of the material, and the applicant is notified of any deficiencies. When all the deficiencies have been corrected, the division makes a determination of whether to publish a draft permit. When a draft permit is generated, a public notice is issued and published in a local newspaper. The draft permit is then reviewed by the applicant, and division field staff. The general public also has an opportunity to review the permit. Based on public response, a public hearing may be held. After considering public comments and a final review, the permit may be issued. The entire process normally takes from five (5) to nine (9) months. Permits are normally valid for five (5) years, except those for pump and haul systems, which are generally valid for one (1) year.

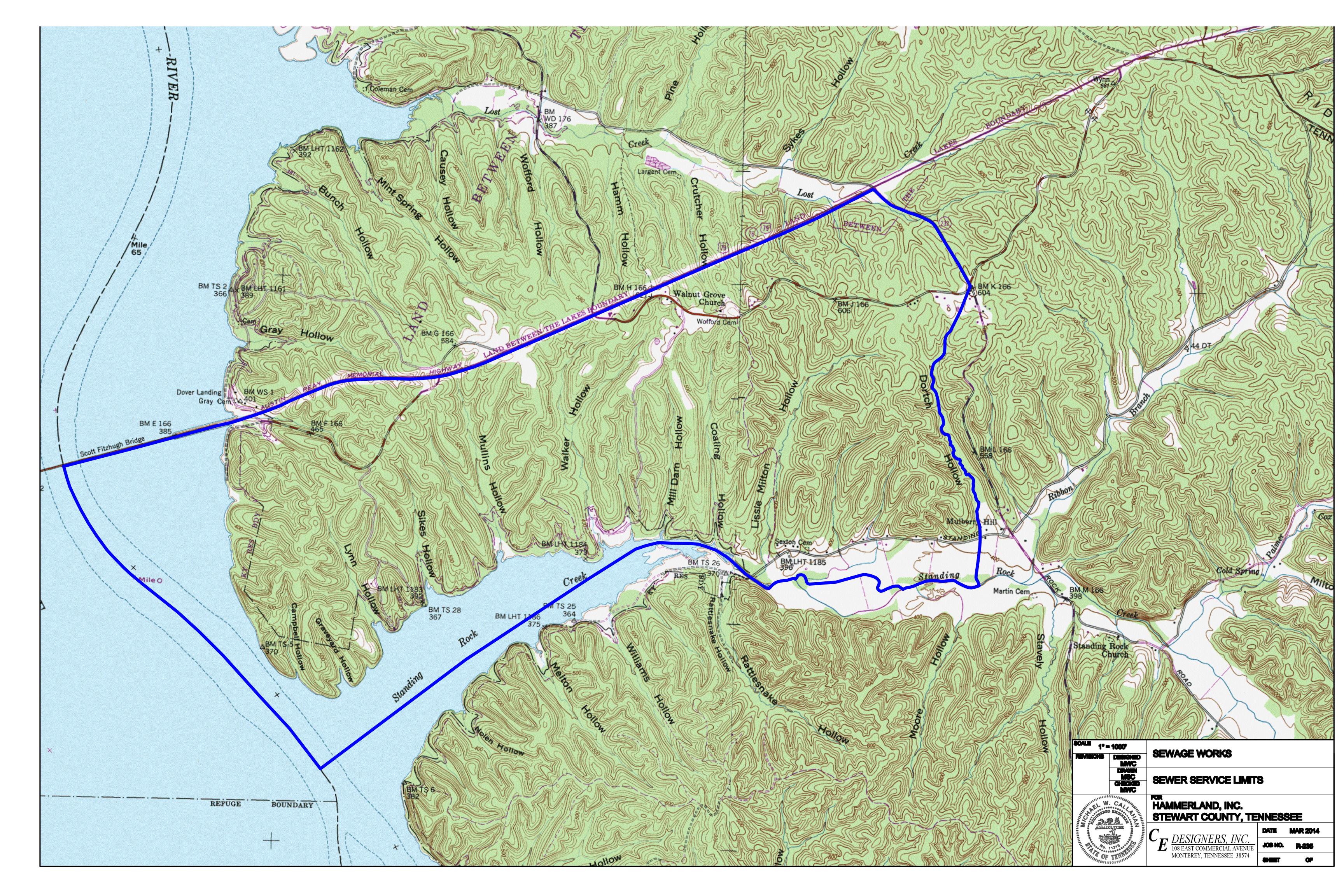
The division has the right to inspect a facility when deemed necessary. In addition, the division has the right to revoke or suspend any permit for violation of permit conditions or any other provisions of the Tennessee Water Quality Control Act and other water pollution control rules.

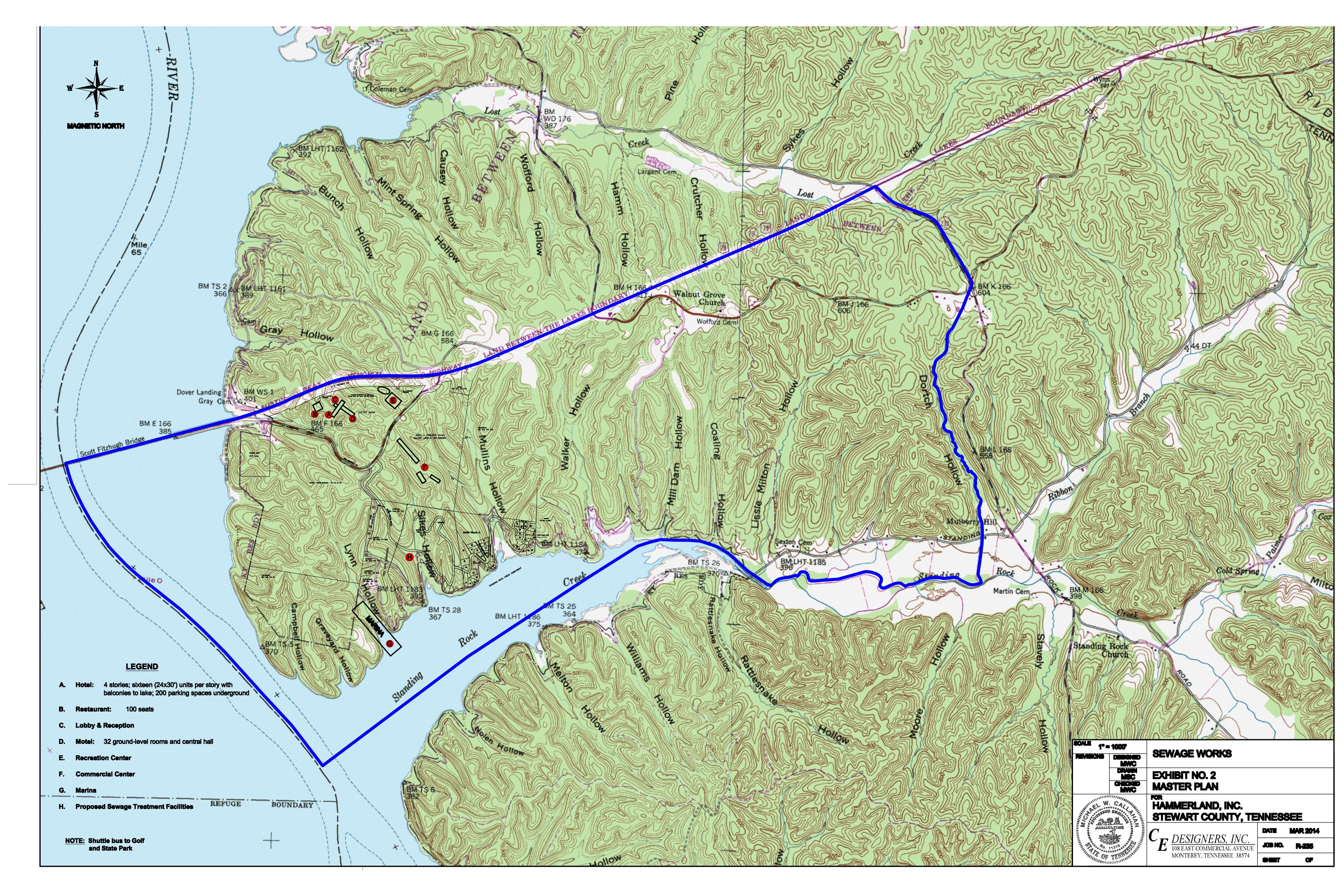
The division is responsible for regulating any activity, which involves a potential discharge in order to protect waters of the State from pollution and to maintain the highest possible standards in water quality.

20 f. Exhibits.

Exhibit No. 1 Sewer Service Limits

Exhibit No. 2 Master Plan





20g. Plans and Specifications.

ENGINEERING REPORT

SEWAGE WORKS

FOR

HAMMERLAND, INC.

RIVER TRACE II SEWAGE TREATMENT PLANT

JOB NUMBER R-226 MAY 2013





ENGINEERING REPORT RIVER TRACE II

A. <u>HISTORY</u>

River Trace II is a residential community being developed in Stewart County and on the eastern waterfront of Kentucky Lake. This property is being developed by Hammerland, Inc. of Chicago, Illinois and has formed a homeowners association.

In 1994, the developer constructed a centralized sewer system which consisted of individual septic tanks at each housing unit equipped with an Orenco System to pump grey water, pressurized collection lines and a common disposal system. The disposal system included a siphon tank, a distribution manifold and 4500 linear feet of 10-inch large diameter septic field line in 30 minute soil. TDEC approved plans were prepared by **C E DESIGNERS, INC.** to serve 18 three bedroom homes. This system received a construction permit from the Ground Water Division of TDEC. A copy is shown in the Appendix.

In February of 2008, permission was given by Bob James of the TDEC Ground Water Division to install an additional 5,000 linear feet of 10-inch large diameter septic field line in 30 minute soil to serve an additional 18 homes. The approval vehicle used was a repair permit. A copy of this document is also shown in the Appendix. No plans and no as-builts for this work were prepared by an engineer.

During the late summer of 2012, the TDEC Ground Water Office in Clarksville received complaints and inspected this facility to find that the siphon tank and the manifold box were full of sewage which was overflowing. This engineer was engaged to assist the Owner and provided TDEC with 1994 plans. After site visits and inspections and conferences, it was determined that the problem was general poor maintenance and that the manifold was plugged. Repairs have been and are being made.

The TDEC Groundwater Division offered the Developer/Owner two options:

- To repair the existing system but to legally restrict it to 18 housing units.
- To install and alternative system subject to TDEC regulations. At this time, the development has 37 potential housing units either connected or with a legal right to connect to the centralized sewer system.

Since the first option so severely restricts the Owners ability to meet its obligation to provide sewer service, the Owner chooses to construct an alternative treatment system. Notes from our meeting with TDEC Ground Water Division are in the Appendix.

B. <u>Alternative Analysis</u>

As in all projects, alternatives are available which must be analyzed. In this case, they are 1) to repair the existing system 2) connect to a nearby system 3) pump and haul sewage and 4) to construct an alternate system.

The option to repair the existing system was rejected because of the severe restrictions placed by TDEC on the number of customers allowed. Repair is the least cost option at about \$35,000 but the obligation to serve 37 households exists.

2) The option to connect to a nearby system was evaluated and rejected as to costly. The Dover Sewer System is 12 miles away along a state highway. The cost of a pipeline and pumping stations is estimated to be \$900,000 plus treatment costs.

A public system is across Kentucky Lake but is 5 miles away of which 2 miles is a water crossing. The estimated cost of this proposal is \$1,500,000 plus treatment costs.

- 3) A pump and haul system was evaluated. At full capacity of 15,000 GPD, three truck loads would be required daily at \$200.00 each. It would take 417 days to spend an amount equal to the estimated cost of the recommended alternative treatment system at \$250,000.
- 4) Constructing an alternative system seems to be the most economic acceptable option. Together, the Owner and the Engineer evaluated several systems and agree that recirculating sand filter with drip field disposal is the best option. The cost is estimated to be \$250,000 to serve 50 units using the available 30 minute soil. Discharge criteria for similar systems is shown in the Appendix.

C. <u>SUMMARY AND RECOMMENDATIONS</u>

1) Purpose of the Report

This report has been prepared to describe calculations used to determine the dosing area for the drip irrigation lines, the soil types and areas acceptable for adequate filtration for the River Trace development, located approximately 1.0 miles off of U.S. 79 and adjacent to the east bank of Kentucky Lake in Stewart County, Tennessee.

This site consists of a total of approximately 32 acres, containing 37 potential residential housing units at approximately 25.80 acres and 6.20 acres of roadways. The development has slopes ranging from 0 percent to over 20 percent, falling toward Kentucky Lake (Tennessee River). Sewer service is provided by household pumps in septic tank units. The project should contain approximately 5,400 linear feet of 2" force main sewer lines, a 15,000 gallon per day recirculation tank, 4 vertical turbine pumps, 2 recirculation sand filter treatment units with a capacity of 7,500 gallon per day per unit, 14,423 linear feet of drip irrigation lines and other various controls and meters. The treatment units may be installed 1 at a time to facilitate adequate treatment on an as needed basis, adding the additional unit as the development builds to capacity.

In the preparation of this report on-site inspection of the site occurred. Meetings with the current owner/developer, TDEC, and other interested parties were held. Detailed discussions were held with the interested parties and their advice has been incorporated into the concept presented in this report.

2) Calculation of Drip Area

In the calculation of the drip area data that has been collected from around the region was used to determine the peak daily flow for each household. For the River Trace area it was determined that 300 GPD (100 GPD/bedroom) was the average peak usage to be used to calculate the maximum (peak) daily flow. Phase I consist of 37 residential units with the potential for growth to 50 residential units in the future for the treatment facility and the drip irrigation field.

Therefore, using the remaining 50 units we are able to determine that the maximum (peak) daily flow using 300 GPD per lot equals 15,000 GPD. At this flow rate the treatment facility will need two (2) 7,500 gallon per day units and a 15,000 gallon per day recirculation tank.

Two methods were used to determine the dosing area needed for the drip irrigation lines, a time-release method and one using the nitrate concentrations. The time-release method uses the absorption rate of the soil, which is 2.0 inch per hour and an assumed number of dosing times. For this calculation, we assumed dosing twice a day at 7 a.m. and 7 p.m. Using the maximum (peak) daily flow of 15,000 GPD, 15,000 GPD divided by 7.48 GPD/ FT³/ DAY equals 2,005.35 FT³/ DAY. Take the 2,005.35 FT³/ DAY and divide that by the number of dosing times and each dose equals 1,002.68 FT³. Using a depth of 3 inches we are able to calculate the dosing area, 1,002.68 FT³ times 12 inches divided by 1 foot divided by 3.0 inches equals 4,010.70 FT² of dosing area. Allowing a drain field cross-section of 5 feet, the length of drip irrigation pipe required is 4,010.70 FT² divided by 5 feet equals approximately 802 linear feet base on the absorption rate.

The Nitrate Loading method uses the calculated maximum nitrate-loading rate of the soil, which is 0.208 gallons per day per square foot. Using the maximum (peak) daily flow of 15,000 GPD, 15,000 GPD divided by 0.208 GPD/ FT² equals 72,115.40 FT². Take the 72,115.40 FT² and divide that by 43,560 FT²/ACRE equal 1.656 acre. Allowing a drain field cross-section of 5 feet, the length of drip irrigation pipe required is 72,115.40 FT² divided by 5 feet equals

approximately 14,423 linear feet based on the nitrate-loading rate. If the drain field cross-section allows for 6 feet, the length of the irrigation pipe required can be lower to a more reasonable length.

The length of irrigation pipe for the nitrate loading method is greater than the time-release method, therefore the nitrate loading method controls the length of irrigation pipe required.

In order to make use of an existing dosing system which includes a dosing siphon and a manifold distribution box, the engineer recommends that the dosing rate of the existing siphon of 825 gallons per dose continue to be used. Since the proposed recirculation tank also serves as an equalization tank, dosing can easily be distributed evenly throughout the 24 hour day.

The existing permit allows for 18 users with a peak flow of 5,400 GPD. This flow would require 6.55 doses per day at every 3 hour 40 minute intervals.

The owner/developer is committed to 37 lots as potential users with a peak flow of 11,100 GPD. This flow would require 13.45 doses per day at 1 hour 45 minute intervals.

The recommended design would allow for 50 residences with a peak flow of 15,000 GPD. This flow would require 18.18 doses per day at 1 hour 20 minute intervals.

The drip area would be divided into 4 subareas, each of approximately 3,606 linear feet of drip irrigation pipe. Each subarea is equipped with a 3 stop Orenco Automatic Distribution Valve Assembly so that no run of pipe is dosed more often than every four hours.

3) Recommendations

The engineer recommends that steps be taken by the current owner, interested parties and their investors to develop the sewage treatment works as follows:

- a. Dig two Pits of 40' by 54' by 6' pits for the Sand Filters units to sit in
- b. Construct an 8' by 32' 15,000 gallon per day recirculation tank
- c. Install an ultraviolet treatment unit
- d. Construct a 3' by 3' splitter box with a pump chamber to feed the dosing system
- e. Install the 14,423 linear feet of drip irrigation lines and distribution valve
- f. Install piping for distribution and recirculation in sand filters
- g. Install Pumps in both the recirculation tank and the discharge pump chamber
- h. Attach all PVC piping and install manholes
- i. Grass and seed drip irrigation field and surrounding area

4) Summary

In conclusion, the current owner, interested parties and their investors need to construct a 15,000 gallon per day treatment facility with approximately 14,423 linear feet of drip irrigation lines to treat the waste water for the 50 housing units potentially served. After considering the types of treatment methods the nitrate-loading rate is the controlling factor in determining the amount of area needed for the adequate treatment of this site.

Wastewater Application Rates Based on Nitrate Concentration RIVER TRACE DEVELOPMENT

Nitrate Loading Rate = Lwn = (©p)(Pr - PET) + U (4.424) / [(1 - f)(Cn) - Cp] - Eqn. 16-5

Calculated Allowable Nitrate Loading Rate

Lwh II

PET =

Table A-3 of Chapter 16 - 5-year return monthly precipitation (in/month)

Table A-2 of Chapter 16 - Potential Evaporation (in/month)

Table A-5 of Chapter 16 - Monthly Nitrogen Uptake Rate by Vegetation (Ibs/acre/month)

Applied Nitrogen Fraction Removed by Denitrification / Volatilization (%)

10 Maximum Nitrate Concentration in Leachate (mg/L)

II II Co

20 Nitrogen Concentration in Applied Wastewater (mg/L)

4.424 Conversion Factor

U = 50 Annual Nitrogen Uptake Rate for Crop, Variable (lbs/acre/yr)

- -									7	
								1. W. S.	1 存(で) ()	7.7.2.E
	7.62	0.10	1%	0.5	25%	15.48	3.57	0.51	0.317	
-	6.72	0.27	2%	que.	25%	13.78	3.18	0.45	0.282	
	8.85	0.97	4%	а	27%	19.05	4.40	0.63	0.390	
	6.59	2.30	8%	খ	29%	14.43	3.33	0.47	0.296	
	6.13	3.59	12%	9	31%	13.67	3.15	0.45	0.280	
	5.52	4.90	15%	7.5	33%	11.58	2.67	0.38	0.237	
	6.85	5.44	17%	8.5	35%	17.23	3.98	0.57	0.353	.
	4.73	9.00	15%	7.5	35%	10.16	2.34	0.33	0.208	
	5.54	3.79	12%	9	34%	13.76	3.18	0.45	0.282	
	4.47	1.98	8%	4	32%	11.83	2.73	0.39	0.242	
	6.11	0.82	4%	2	78%	14.70	3.39	0.48	0.301	
	7.55	0.27	2%	-	76%	16.09	3.71	0.53	0.330	
TOTALS	76.68	29.43	100%	50		171.78				

RIVER TRACE DEVELOPMENT SEWAGE TREATMENT PLANT STEWART COUNTY, TENNESSEE

<u>ITEM</u>		NO. UNITS	U	NIT COST	1	TOTAL COST
Site Grading		1	\$	8,000.00	\$	8,000.00
Recirculating Sand Filter	70' X 70'	2	\$	37,500.00	\$	75,000.00
Recirculation Tank		1	\$	30,000.00	\$	30,000.00
Recirculating Pumps		3	\$	5,000.00	\$	15,000.00
Site Piping		1	\$	15,000.00	\$	15,000.00
Disinfection and Controls		1	\$	15,000.00	\$	15,000.00
Drip Irrigation		15,000	\$	2.00	\$	30,000
Construction Contingence	у				\$	12,000.00
TOTAL ESTIMATED	CONSTRUCTION C	OST			\$	200,000.00
	Engineering: Design &	General			\$	20,000.00
	Resident Inspection				\$	20,000.00
	Land & Rights-of-way					
	Surveying	7			\$	5,000.00
	Legal					
	Project Contingency				\$	5,000.00
TOTAL ESTIMATED	PROJECT COST				\$	250,000.00



1994 TDEC CONSTRUCTION PERMIT

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION DIVISION OF GROUND WATER PROTECTION

PERMIT FOR CONSTRU	CTION OF SUBSURFACE SEWAGE DISPOSAL SYSTEM
to: Process Developer, Contractor, Installer, Brc. Location: LIGHT TACE KDAD	Evaluation Based Upon: () 1. Soil typing by Soil Scientist
Installation: () 1. New Installation () 2. Repair to Existing System	() 2 Soil Perculation Test () 3 Environmental Specialist () 3 Environmental Specialist () a Sand backfill required Estimated Absorption Rate: Approval based upon:
Establishment: (X1. Residential: # Bedrooms 18X3 = 54 (X2. Other: Centro Lines Justine)	Statute No. T.C.A. 68-221-403 () (c) Percolation test () (d) Grandfather clause. Current standards except those specified () (k) Grandfather clause — meets June 30, 1990 standards (repair except those specified
Gal/Day	() (f) 12" (karst) and 6" (non-karst) buffer (X) Other AQE SYSTEM
This system shall consist of a two compartment septic tank holding 15 gallons, with 15 linear feet in trenches, 24 wide and 24 inches deep. (Depth of gravel: 14 inches) All installers of subsurface sewage disposal systems must hold a valid annual	
The recipient of this permit agrees to construct or have constructed it Sewage Disposal Systems. If any part of the system is covered before Department of Environment and Consecution, Any cutting, filling and void. (Signature of Recipient) Issued at	he above described system in accordance with T.C.A. 68-221-401 et, seq. and The Regulations To Govern Subsurface e being inspected and approved, it shall be uncovered by the recipient of the permit at the direction of personnel of the or alterations of the soil conditions on the aforementioned property after this day may render this approval null Date Tennessee, in Howard County Date Tennessee, in Howard County
	(Date of Issue) his permit is valid for 3 years from date of issue.
Trotes	DUN SEPTIC FANK (1500 GA) AND
* SEE PAHACHED	CENTRALIZED WEATION
FOR SOECIFIC	5400 liver 1 feet of 10" (1)6P
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residences - 3 bes	System 1 Think pius Man Fold
54 × 100 = 5400 /0 to/	Field WE AGE
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	125 gal/cycle into Each
	X CrossoverSEPField Line Solid Line

This is a permit to construct and is not intended to imply approval of any work proposed or completed on this lot.

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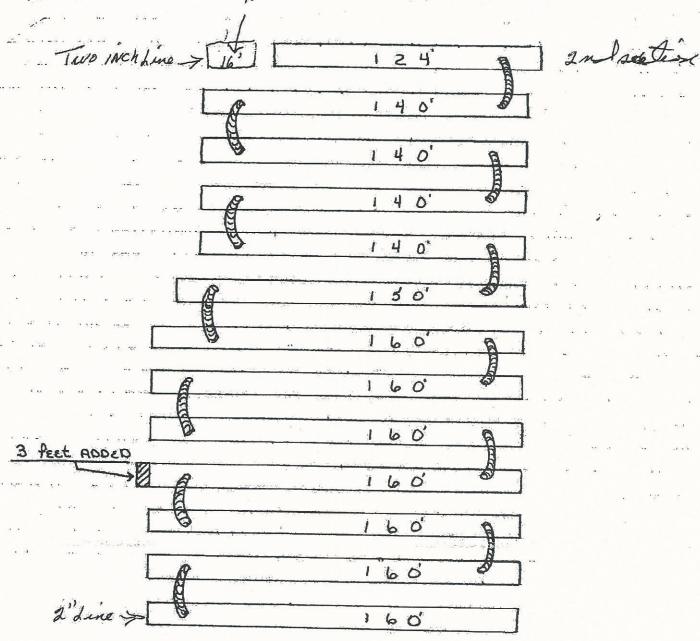
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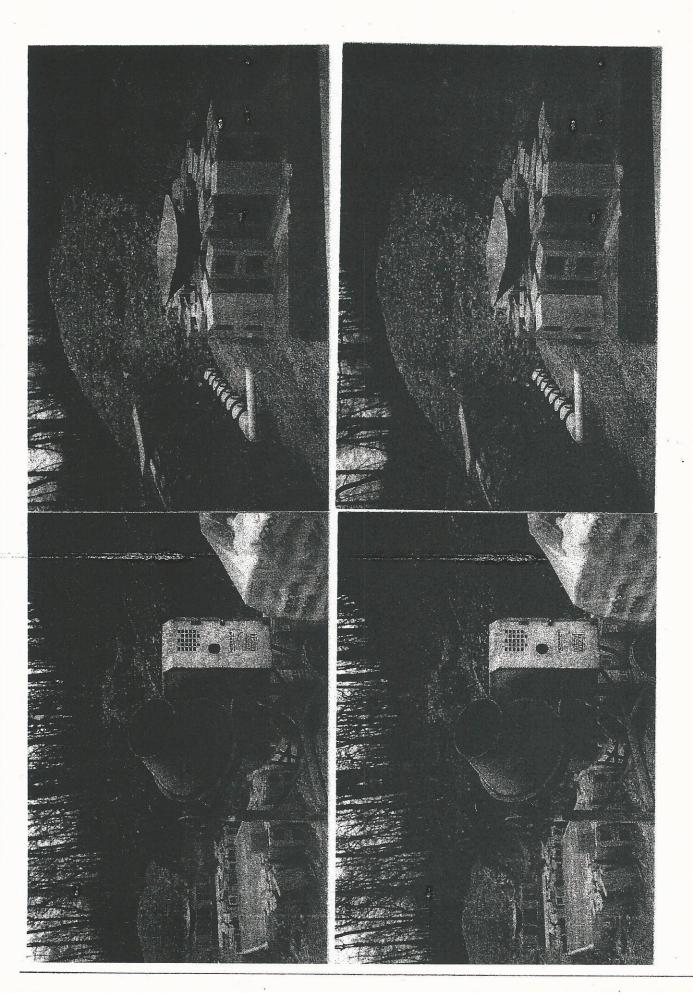
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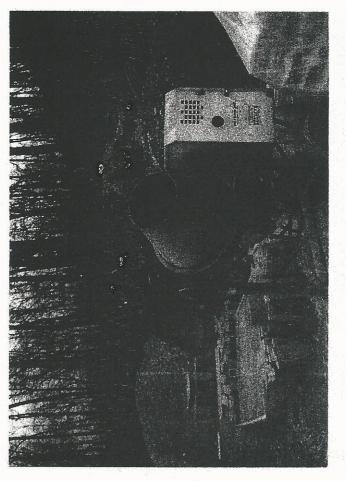
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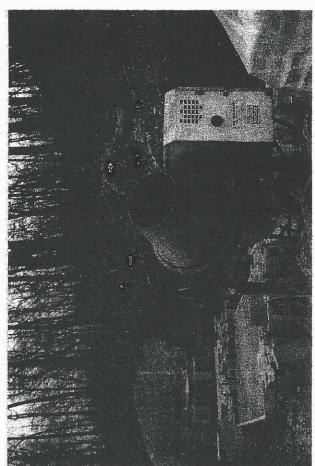
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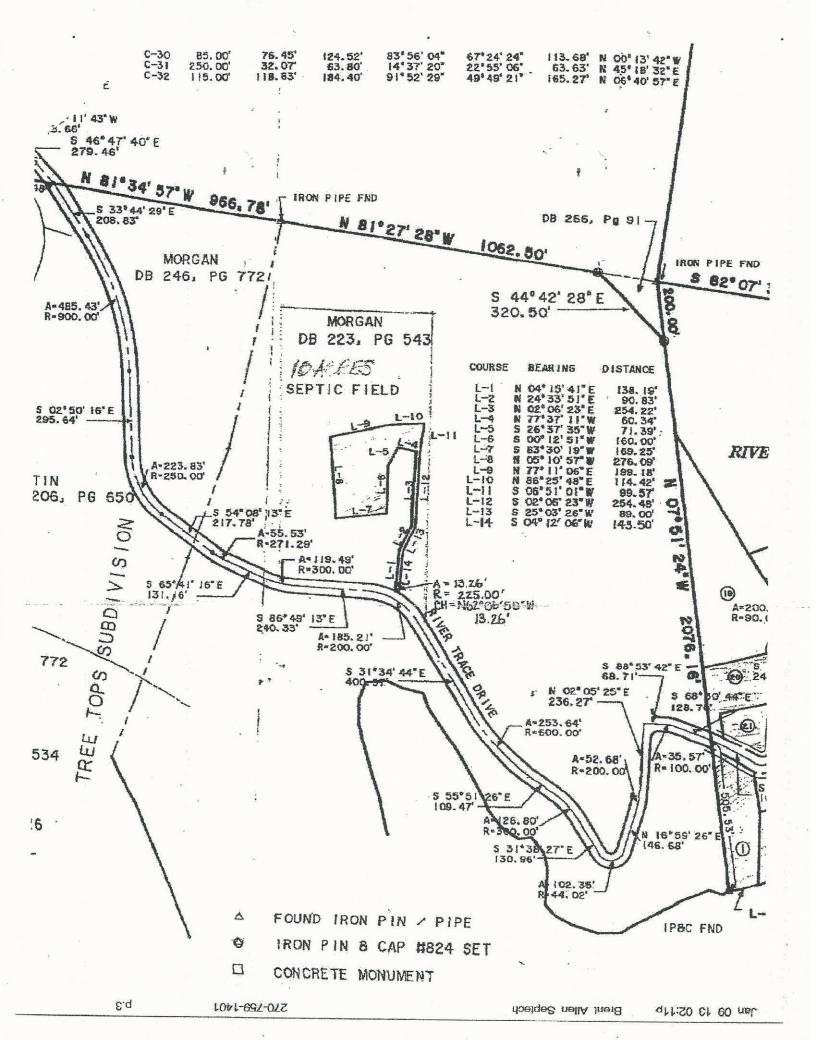


TOTAL FEET









2008 TDEC REPAIR PERMIT



Stewart County Community Medical Center

P.O. Box 497 • Dover, Tennessee 37058 • tel. (931) 232-5329 • fex (931) 232-7247

FAX TRANSMITTAL MEMO

10:	Browt Allen	* 6
FAX NUMBER:	270-759-1401	
FROM:	Bob JAMES	
SUBJECT:	River Tract	
DATE:	2/20/08	
IF YOU DO NOT REC	ELVE THIS ENTIRE DOCUMENT OR HAVE AND	QUESTIONS,
CALL	Bole James	***************************************
TELEPHONE NO.		
MESSAGE:		
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THIS FACSIMILE CONTAINS PRIVILECED AND CONFIDENTIAL INFORMATION WHICH IS INVENDED FOR THE USE OF THE ADDRESSEE LISTED ABOVE. If you are neither the intended recipient or the employee responsible for delivering this information to the intened recipient, you are hereby notified that any disclourse, copying, distributing, or taking any action regarding the content of this information is strictly prohibited. If you have received this fax in error, please notify us immediately.

Sponsored by Tennessae Department of Health U.S. Department of Health and Human Services and Stewart County Government

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Pages



AND UNDERGROUND CONSTRUCTION

430 WEST DRIVE - MURRAY, KY 42071 (270) 759-1515

PROP	DSAL AN	
	PTANCE	

PROPOSAL CLIPATITIES OF	KEN 731-225-7958
PROPOSAL SUBMITTED TO	PHONE DATE
STREET MONGAN	731-642-1399 1-14-08
	JOB NAME
CITY, STATE AND ZIP CODE	PIVEL THE LE
BUCHANAN TN. 38222	
ARCHITECT DATE OF PLANS	SHEWART CO. TENN.
	JOB PHONE
We hereby submit specifications and estimates for:	
CONNECT TO EXISTING S	EPTIC EFFLUENT DISTINBUTION
CUSTEM AND CONCERNET CO.	
SYSTEM AND CONSTRUCT SOOD	LIFE DF 10" SB2 CHAIRUES
SEPTIC FIELD LINE THESE	UNIL RONGE IN LENGTH FROM
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We Propose hereby to furnish material and labor	complete in accordance with above specifications, for the sum of:
77.60.74	omplete in accordance with above specifications, for the sum of:
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COMPLETION.	the state of the s
All material is guaranteed to be as specified. All work to be completed in a workmanlike mannaccording to standard practices. Any afteration or doubting the process of the complete of the co	
extra costs will be executed ash	ng Authorized
above the estimate. All agreements and will become an extra charge over a	nd Signature (17104)
trol. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered Workman's Compensation Insurance.	by Note in s proposal may be
	withdrawn by us if not accepted within days.
Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are berefy accepted to	
and conditions are satisfactory and are hereby accepted. You are authorized to do work as specified. Payment will be made are by	
of tibde as outlined above.	Signature
Date of Acceptance	Signature
	Signature

DEPARTMENT OF ENVIRONMENT AND CONSERVATION



DIVISION OF GROUND WATER PROTECTION

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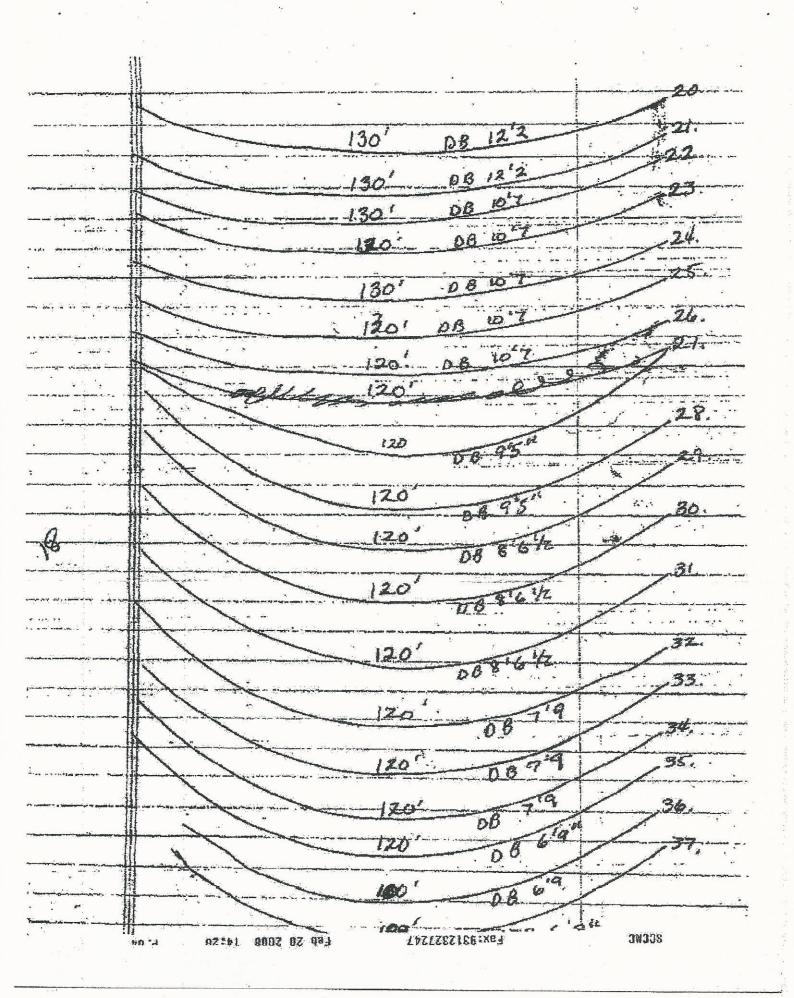
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CHARTE (Nov. 4-90)

Chipmal File

Copper Change

1951A 2412



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PROJECT #2 ELMHURST STONE SEWER EXTENSION

Ken Lahner

Extension of sewer field lines of 5,000 linear feet of 10' SB-2 gravel-less pipe.

I have contacted the Health Officer for Stewart County and he gave me to approval to install it at this time. The original cost of installation of the first 5,000 feet in 1994 was \$25,500.00.

The best bid I have received on the extension of 5,000 feet is \$29,750.00. In addition to this cost is the cost to re-construct the top of one of the sewer concrete tanks in the amount of \$1,500. Making the total cost for this project \$31,250.00.

Enclosed is a copy of the 1994 invoice, copy of the proposal for the new field line installation and a map showing where the Health Department has proposed the placement of the new lines.

When this is completed it will fulfill our obligation to the subdivision. We have never incurred any expense for the sewer in the last 14 years other than what I have done personally.

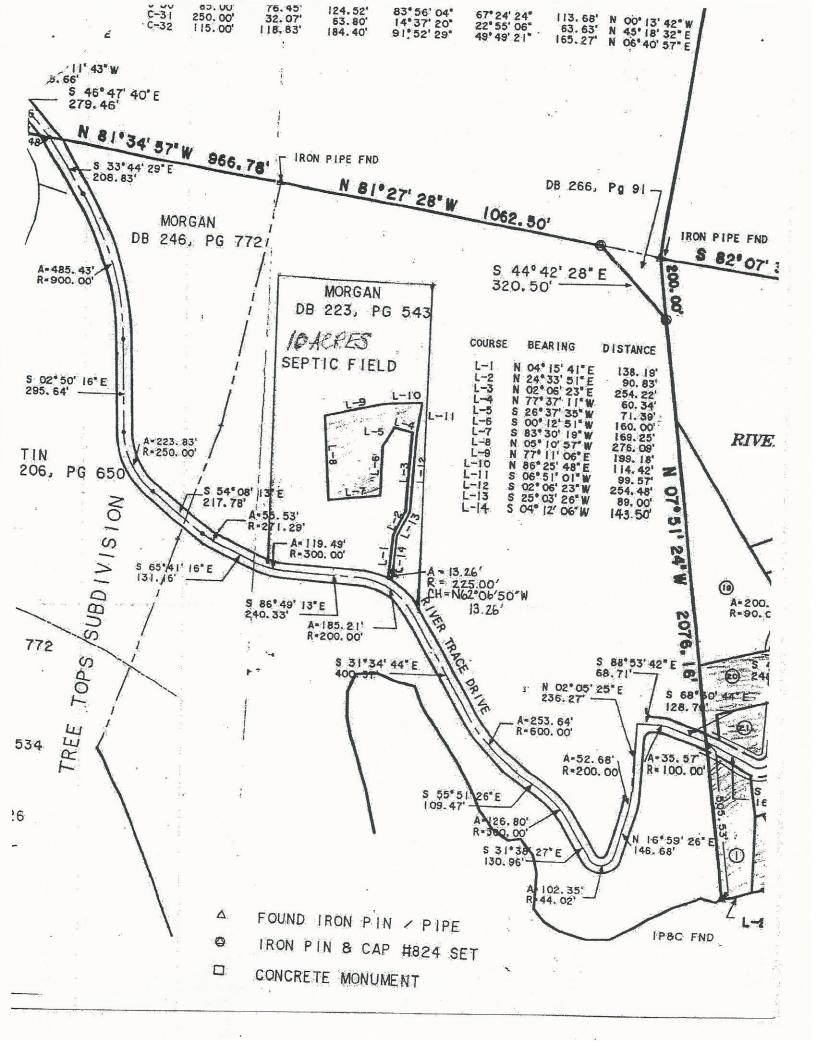
Respectfully submitted,

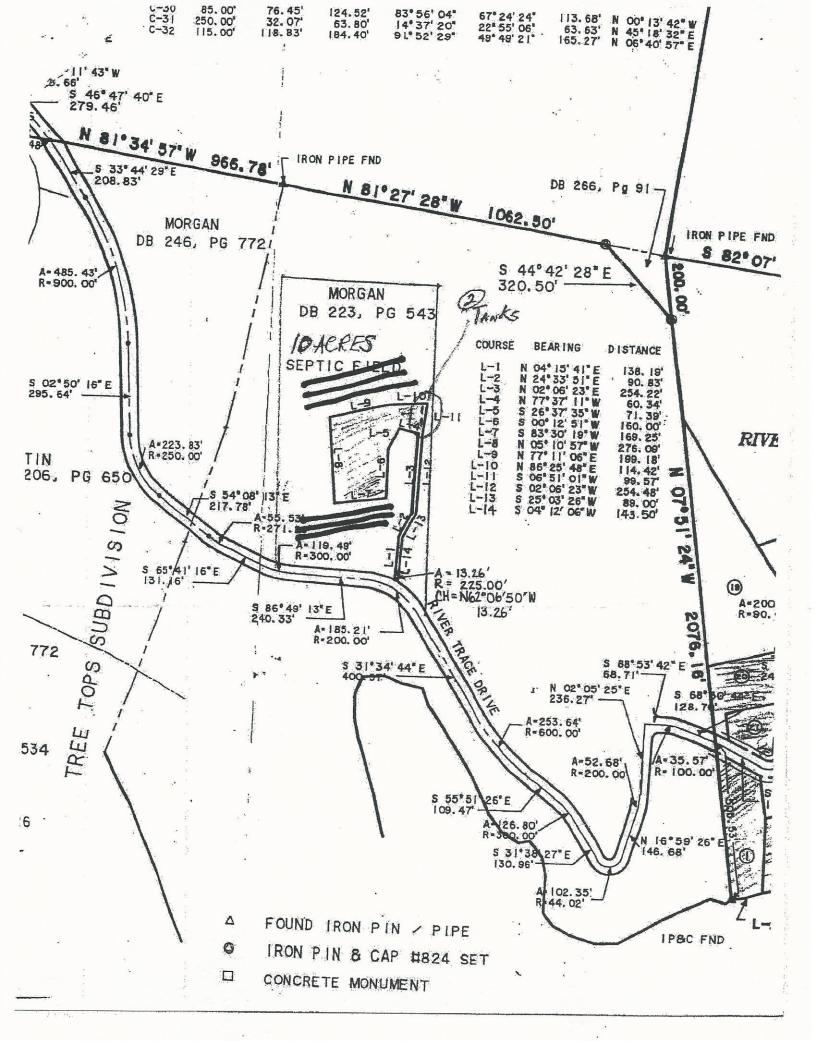
Ken Morgan

ROY GRISSOM & SONS

Lic. General Contractor Lic. # 27453 210 Taylor Chapel Rd. Dover, Tenn 37058 (615) 232-6003

INVOICE			•:	<u></u>	19928
(SOLD TO River Trace		SHIP TO	,		
CITY, STATE, ZIP Dover / N	2.	CITY, STATE, ZIP		73	
CUSTOMER ORDER NO. SALESMAN	TERMS		F.O.B. PRICE	DATE 17	Dec 94
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TDEC

GROUND WATER

OPTIONS

<u>AND</u>

RESTRICTIONS

RIVER TRACE S/D MEETING

In attendance: Brent Milen, Randy Stamps, Mike Callahan, Pam Bygder Falikapadia, Jimmy Tennette.

Purpose: Discuss approval options and repairs

OPTION 1: USING THE EXISTING SYSTEM

- 1) Based upon the submitted design and the repair COC permitted and signed off on by Bob James we can legally allow 18 3BR homes
- We will communicate to electrical company that only 18 3BR homes will be permitted in River Trace S/D

6 homes now. - Reflect who all is on system now.

- 2) Require plat to be amended to restrict S/D to 18 lots.
 - Plat must reflect easement, either shown or plat or described on plat
 - Legal easement to system area must be recorded

- 3) Owner of tract where system is located must apply for repair permit or give written authority to a local representative to do so

 Parm is agent owner permission by owner.
- 4) Repair of the system:
 - Will be an engineer designed pump dosing system that will dose the repair lines approved by Bob James via a pressurized header/distribution manifold



OPTION 2

- 1) Apply for State Operating Permit (SOP)
- 2) Would require complete new set of plans, design, plat approval
- 3) Most likely involve a decentralized system with treatment component, recirculating sand filter and drip lines
- 4) Design by engineer and submitted to Div. Water Resources Land Based Systems for approval and permitting—Brad Harris most likely contact
- 5) Costly but would increase number of lots and allow for more homes

QUESTIONS AND DISCUSSION NOTES:

2) About many lots are sold?

2) Aboutly look & dulopus land for additional system flage system?

4) Repair to begin 1540.

6) Jeff to walnote lot for individual systems.

- We will help identify 4-5 points where the system will be dosed
- Primary system (original) will not be used because it is installed
 too deep- soil map restricts depth of installation to 24 inches-top
 of lines are 36 inches deep and no record of inspection, line
 location cannot be determined
 - Repair lines are installed much closer to the 24 in depth restriction
 - Repair lines that were dug up during soil testing
 - Place sod or ground cover over eroded areas
- Will require an alarm system that is audible and visible
- Will require electrical inspection, Blue sticker
- 5) Future permitting of residences
 - We will permit 3 BR residences, permit each new tank
 - Permits will reflect tank and pump as specified in the original design by mike Callahan (may want to amend to 2 compartment tanks) alarm required (visible and audible)
 - We will inspect and approve or disapprove each tanks and components
 - Electrical inspection required of electrical components prior to approval
 - Contact # for homeowners' association once established
 - · Brent would take care of system

RECIRCULATING

SAND FILTER

DISCHARGE

LIMITS

A. EFFLUENT LIMITATION AND MONITORING REQUIREMENTS

Discharge 001 consists of domestic wastewater from a treatment facility with a design capacity of .04 MGD. Discharge 001 shall be limited and monitored by the permittee as specified below.

Description: External Outfall, Number: 001, Monitoring: Effluent Gross, Season: All Year							
Parameter	Qualifier			Sample Type	Frequency	Statistical Base	
CBOD, 5-day, 20 C	<=	25	mg/L	Grab	Twice Per Month	Monthly Average	
CBOD, 5-day, 20 C	<=	40	mg/L	/ Grab	Twice Per Month	Daily Maximum	
Chlorine, total residual (TRC)	<=	.02	mg/L	Grab	Five Per Week	Instantaneous Maximum	
E. coli, MTEC-MF	<=	126	#/100mL	Grab	Twice Per Month	Monthly Average	
E. coli, MTEC-MF	<=	941	#/100mL	Grab	Twice Per Month	Daily Maximum	
Flow	Report	-	Mgal/d	Instantaneous	Five Per Week		
Flow	Report		Mgal/d	Instantaneous	Five Per Week	Daily Maximum	
Nitrogen, Ammonia total (as N)	<=	10	mg/L	Grab	Twice Per Month	Daily Maximum	
Nitrogen, Ammonia total (as N)	<=	5	mg/L	Grab	Twice Per Month	Monthly Average	
Oxygen, dissolved (DO)	>= '	6	mg/L	Grab	Five Per Week	Instantaneous Minimum	
Settleable Solids	<=	1	mL/L	Grab	Two Per Week	Daily Maximum	
Total Suspended Solids (TSS)	<=	30	mg/L	Grab	Twice Per Month	Monthly Average	
Total Suspended Solids (TSS)	<=	45	mg/L	Grab	Twice Per Month	Daily Maximum	
pH	>=	6	SU	Grab	Two Per Week	Daily Minimum	
pH	<=	9	SU	Grab	Two Per Week	Daily Maximum	

[&]quot;The acceptable methods for analysis of TRC are any methods specified in Title 40 CFR, Part 136 as amended. The method detection level (MDL) for TRC shall not exceed 0.05 mg/l unless the permittee demonstrates that its MDL is higher. The permittee shall retain the documentation that justifies the higher MDL and have it available for review upon request."

SECTION 1

GENERAL SCOPE AND SPECIAL PROVISIONS

1. Scope of Work

The work to be accomplished under these specifications consist of the furnishing of all labor, materials, equipment, and services necessary for the construction of a Waste Water Treatment System for River Trace II, Stewart County, Tennessee.

The work to be performed under Contract I consists of the construction of a 15,000 gallon per day Waste Water Treatment System to serve River Trace II in Stewart County, Tennessee, and other appurtenant work as set in these specifications and shown on the plans. The base bid is for construction using recirculating sand filters. Demolition and removal of the existing treatment units is not required. Some repair of existing facilities may be needed.

2. Execution and Coordination

It is intended that the work covered by this Contract be done so as to cause the minimum interference with the normal operation of the existing utilities. The Contractor will be required to organize and schedule his work so as to keep the existing facilities in full operation during the construction period insofar as is consistent with the nature of the construction work to be performed.

The manner in which shutdowns will be made, and the Contractor's work schedule will be subject to the approval of the Engineer; and although every effort will be made to cause the minimum amount of interference with the Contractor's work, the interest of the Owner in regard to the existing facilities must always take precedence over the construction work.

Therefore, the right is reserved by the Owner to put any lines or other facilities that may be shutdown for the construction work back into service when an emergency arises. The Contractor shall not interrupt the service to any customer for more than a 24-hour period

The Contractor must have sufficient materials, equipment, labor and supervision available to accomplish the work required in the time allocated for any shutdown.

3. Order of Work and Time of Completion

Work on the Contract shall be prosecuted in a timely manner. The work shall be constructed in such a manner that portions of the system can be placed into service as soon as possible.

Time of completion of the Contract is as follows:

Contract I - One Hundred Fifty (150) calendar days for the completion of all work.

4. <u>Progress Pictures</u>

None required.

5. Field Office

None required.

6. <u>Lines and Grades</u>

The contractor shall be responsible for all lines and grades required for the site grading and piping and appurtenances. The contractor shall be responsible for setting slope stakes, fill stakes, and blue tops necessary to meet the requirements of these Specifications. All stakes, lines and grades shall be subject to the approval of the Engineer.

7. Work on or Adjacent to Private Property

In connection with work performed on or adjacent to private property, the contractor shall take every precaution to avoid damage to the property owner's buildings, grounds and facilities and shall be completely responsible for the repair of damage to same. Fences, hedges, shrubs, etc., within the construction limits shall be carefully removed, preserved and replaced when the construction is completed. If sod is damaged or not handled properly, it shall be replaced with new sod equal to existing sod at the contractor's expense. Grassed areas, other than lawns, shall be graded, fertilized and seeded when the construction is completed in accordance with the requirements set out hereinafter. When construction is completed, the private property owners' facilities and grounds shall be restored to as good or better than their original condition.

Large trees, or other facilities within the actual construction limits that cannot be preserved and replaced shall be removed by the contractor. The Owner will assume the responsibility for settling with the property owner for the loss of said trees or facilities within the construction area when said removal is approved by the Engineer. The trees and facilities to be removed will be designated on the plans and the contractor shall be solely and entirely responsible for any damage to trees or facilities not so designated.

Foundations adjacent to an excavation which is to be carried below the bottom of the foundation shall be supported by shoring, bracing, or underpinning and the contractor shall be held strictly responsible for any damage to said foundation.

Work on the rights-of-way of the State Highway Department or Stewart County shall be considered work on private property.

8. <u>Existing Utilities</u>

From investigation during the design surveys, the following existing utilities were found to be present in one or more of the areas involved.

<u>Utilities</u> <u>Owner</u>

Water Lines None

Power Lines Cumberland Electric Cooperative

Telephone Lines AT&T Gas Lines None

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

With particular respect to existing underground utilities, all available information concerning their location has been shown on the plans. While it is believed that the locations shown are reasonably correct, neither the Engineer nor the Owner can guarantee the accuracy of this information.

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 where possible and approved by the utility, 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 objections 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.

It is suggested that the contractor locate all unknown metallic hazards, namely buried pipe, metals, etc., by using a pipe locator. The pipe locator should immediately precede the excavation and all hazards be located and marked with a pointed stake in such manner as to notify the operator of such hazard. The Engineer may require this procedure.

Where existing utilities or other underground structures are encountered, they shall not be displaced or molested unless necessary and approved by the Owner of the facility and in such case they shall be replaced in as good or better condition than found as quickly as possible. All such utilities that are so damaged or molested shall be replaced at the contractor's expense, unless in the opinion of the Engineer such damage was caused through no fault of the contractor.

It is expected that the contractor will be diligent in his effort and use every possible means to locate existing utilities. Any claim 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.

9. Progress Schedule

For each contract there shall be furnished for approval a suitable progress chart or schedule in graphical form showing the estimated schedule for the project. After approval the contractor(s) shall keep the chart current showing actual progress on the project in relation to the estimated schedule.

10. Project Sign

Each Contractor shall provide a project sign. Each sign shall be 3/4-inch exterior A/C Grade plywood 4' x 8' with proper bracing. The bottom edge shall be approximately five (5) feet from the ground and the sign shall be painted on all sides including the posts, and maintained in a plumb and appropriate manner during the project.

A mock up of the exact sign <u>shall be submitted</u> and approved prior to its painting, and the fully painted sign shall be inspected prior to its erection.

WASTE WATER TREATMENT SYSTEM

RIVER TRACE II

STEWART COUNTY, TENNESSEE

C E DESIGNERS, INC. Monterey, Tennessee 38574

> Contractor's Name Contractor's Address

After the contract is formally accepted by the Owner the contractor shall remove his signs; in the meantime they shall be maintained, including repainting if necessary.

11. Shop Drawings

a. General

Within thirty (30) days after the contract has been awarded, the contractor shall submit to the Engineer a complete list of all material and equipment that he proposes to use on this project. This list shall include the names of the suppliers and manufacturers, trade names, specific catalog numbers and any other information necessary to describe the items.

The contractor shall submit a minimum of five (5) and a maximum of nine (9) copies of brochures and shop drawings of all materials and equipment that he proposes to use on this project.

Brochures and shop drawings shall be submitted in time to allow thirty (30) days from the date of receipt in the Engineer's office before final approval is required to meet construction schedules. In all cases, the contractor shall allow sufficient time for review by the Engineer. All submittals shall bear the contractor's stamp of approval indicating he has examined and checked same and information contained therein is in accordance with the contract requirements. The Engineer's approval shall not be construed as relieving the contractor of responsibility for completeness, accuracy, compatibility and compliance with the plans, specifications and contract documents. Rejection or disapproval of the same submittals by the Engineer on three (3) separate occasions will constitute grounds for total rejection of the proposed equipment manufacturer or supplier as being unable or unwilling to meet the specifications.

The above mentioned brochures and shop drawings are to be submitted and approved before any of the materials or equipment described therein are installed.

b. <u>Submittals</u>

Submit complete descriptions, illustrations, specification, data, dimensions and any other required data of all materials and equipment, including the following:

- (1) Concrete Mix
- (2) Pipe Design
- (3) Pump Design
- (4) Distribution Valve
- (5) Filter Media
- (6) Septic Tank Filter
- (7) Control Box and Wiring
- (8) Recirculation Box and Septic Tank
- (9) Electrical Components
- (10) Drip Lines

The proposed items are to be clearly indicated when other items are shown on the same sheet. When proposing items other than those specified, submittal shall contain both the specified item data and proposed item data for ease of comparison.

Upon request from the Engineer, samples shall be submitted or set up, as directed, for inspection and approval. Samples will be returned to the contractor.

12. Materials or Equipment to be Furnished

Where materials or equipment are specified by trade or brand name, it is not the intention of the Engineer to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality or performance, and to establish an equal basis for the evaluation of bids. Where the words "equivalent", "proper", or "equal to" are used, they shall be understood to mean that the item referred to shall be proper, the equivalent of, or equal to some other items, in the opinion or judgement of the Engineer. Unless otherwise specified, all materials shall be the best of their respective samples. Even though the words "equal to" or other such expressions may be used in the specifications in connection with a material, manufactured article, or process, the material, article, or process specifically designated shall be used, unless a substitute is approved in writing by

the Engineer, and the Engineer shall have the right to require the use of such specifically designated materials, article, or process.

The use of second hand and/or salvaged materials will not be permitted unless specifically provided for in the Specifications and approved by the Engineer.

No materials manufactured or produced in a penal or correctional institute shall be incorporated in the project under this contract.

Only such unmanufactured articles, materials, and supplies as have been mined or produced in the United States of America substantially all from articles, materials, or supplies mined, produced, or manufactured - as the case may be - in the United States of America, shall be employed under these contracts in the construction of the project, except in such cases as specific reference is made in the Detailed Specifications to foreign products or in such cases as the bidders may receive specific written approval of the Engineer in the form of Addenda previous to the bid date.

13. Supervision of Installation

All special equipment or materials under these contracts shall be installed under the supervision of a qualified installation engineer and/or representative furnished by the manufacturer of such equipment or materials.

14. <u>Utilities Required by Contractor</u>

All electric current and/or any utility service required by the contractor shall be furnished at his own expense except as noted hereinafter. The Owner shall furnish all power required after initial operation begins.

15. Water and Uplift

The contractor shall, by the use of well points, pumps or other approved methods, prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed. The contractor shall also provide for dewatering areas adjacent to structures or lines to prevent uplift during construction operations. The contractor will be held responsible for any damage due to uplift of such structures or lines and to existing structures during construction operations.

16. Blasting

All blasting operations including storage of explosives shall be in accordance with the municipal ordinances and state laws, and all explosives shall be stored in conformance with said ordinances and laws. No blasting shall be done within five (5) feet of any gas main, except with light charges of explosives. Any damage done by blasting is the responsibility of the contractor, and shall be promptly and satisfactorily repaired by him.

To implement these requirements and unless otherwise required by ordinance or law, each excavating crew shall be provided with two (2) metal boxes with suitable locks. One of these boxes shall be for storing explosives and one for caps. The boxes shall always be locked except when in actual use. They shall be painted a bright color and stenciled with appropriate warning signs. At night all explosives and caps shall be removed from the boxes and stored in a central magazine. Compliance with laws, ordinances, and regulations shall be the contractor's responsibility and he shall save the Owner and Engineer harmless from any and all claims of any type or nature arising from blasting or storage of explosives.

17. Permits and Fees

The contractor shall make application for, obtain, and pay for all building permits, inspection fees, etc., necessary for the construction of this work (including electrical and plumbing inspection fees). The contractor shall pay the cost of temporary utilities. The Owner shall obtain easements and permits for occupancy with public and private agencies and shall pay all fees associated with obtaining access to the construction sites. The Owner will also pay for the deposits and fees for the connection of permanent utilities.

The Contractor shall prepare and obtain approval from the state (TDEC) for the storm water permit (SWPPP) and the Notice of Intent (NOI) on this project prior to beginning of construction. The Contractor shall furnish a copy of all applications and permits to the Engineer.

18. <u>Soundings</u>

Neither the Owner nor the Engineer will be responsible for sub-surface conditions. Rock soundings were <u>not</u> made. However, it should be noted that rock is <u>not</u> prevalent in the area and the contractor should make his own determination concerning the quantity of rock prior to bidding. A soil survey was conducted and is included in the Plans.

19. Occupational Safety and Health Act

All work carried out under this contract shall be done in strict compliance with the Occupational Safety and Health act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

It is not the intention of these Specifications to conflict with the Act in any way, and where conflicts may arise the Act shall govern.

20. Responsibility of Methods of Construction

The Engineer shall not and will not be considered in charge of or responsible for acts of the Contractor(s), methods of construction, construction, construction progress, construction forces or equipment or safety procedures.

21. Erosion Control

The Contractor shall control erosion on the construction site and shall control the escape of sediment into nearby waterways. These actions shall be in accordance with the practices recommended in the <u>Tennessee Erosion & Sediment Control Handbook</u> which is adopted as part of these Specifications by reference, and with the previously obtained storm water permit.

22. Final Clean-Up

Before the work is considered complete, all rubbish and unused materials due to or connected with the construction shall be removed and the premises left in a condition satisfactory to the Engineer. Streets, curbs, cross-walks, pavements, sidewalks, fences, and other public and private property disturbed or damaged shall be restored to their former condition at the Contractor's expense. Final acceptance will be withheld until such work is completed.

SECTION 2

TESTING AND CONTROL OF MATERIALS

1. Scope

This Section together with such additions, deletions, or modifications, if any, as may appear in any other particular section of the Detailed Specifications shall govern the furnishing and testing of materials to be used in the work.

Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to establish conformance with Specifications and suitability for uses intended.

2. Cost of Tests and Selection of Testing Agencies

All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency will be selected by the Contractor subject to the approval of the Engineer. The Owner will pay for all laboratory inspection service direct, and not as a part of the Contract.

3. Sources of Supply

The Contractor shall submit a list indicating his source of supply of all materials including manufactured items and receive the Engineer's approval prior to the placing of orders. The Engineer may require representative samples of any materials prior to approval of the source. The Engineer's approval of the source of any sample shall not be construed to relieve the Contractor of furnishing materials which fully meet all provisions of the Specifications. If it is found that sources of supply which have been approved do not furnish uniformly acceptable products, the approval may be withdrawn. The Contractor and his supplier shall afford the Engineer or his representatives opportunities for inspecting products and materials at any time during their preparation. The Contractor and/or supplier shall furnish shipment thereof, without charge.

Approval of Testing Agencies and Reports

Whenever in these Documents inspection and testing of materials is required, bureaus, laboratories, and/or agencies selected by the Contractor for such inspection and testing service shall be approved by the Engineer, that the material has passed the required inspection and testing must be furnished prior to the incorporation of such materials in the work, and rejected materials must be promptly removed from the premises.

Six copies of all test reports shall be sent to the Engineer's home (Monterey) office for checking and distribution.

Test reports shall contain as a minimum (1) the name and location of the supplier's plant, (2) the name of the person gathering sample, (3) the date of the sampling, and (4) such other like data as may be required by the Engineer.

5. Governing Specifications

It is the intention of the Engineer in the preparation of the General and Detailed Specifications to define properly the kind and quality of materials to be furnished. The standards and tentative standards of the American Society of Testing Materials (ASTM); standards of the American Waterworks Association (AWWA); standards of the American National Standards Institute (ANSI); standards promulgated by the Federal Specifications Board (Fed. Spec.); American Association of State Highway Officials (AASHO); the Federal Aviation Agency (FAA); or other such agencies may be referred to in the Specifications. Where such standards are referred to, said references shall be construed to mean the latest amended and/or revised versions of the said standard or tentative specifications unless specifically stated otherwise. In the selection of samples and the routine testing of materials, the testing laboratory shall follow the standard procedure as outlined by the ADTM, unless otherwise set out.

6. Extent of Inspection and Testing Service

It is intended that materials of construction, particularly those upon which the strength and durability of structures may depend, shall be inspected and tested to establish conformance with Specifications and suitability for uses intended. The following is a schedule showing the extent of testing and requirements and methods of reporting. If it is found that this list does not cover all items that will require testing, then such materials shall be tested as directed by the Engineer.

7. Cement

Cement shall have been shipped from the mill not more than three months prior to receipt on the work.

a. Where the total project requirement is less than 200 barrels (one car) and the concrete is furnished by a ready-mix plant:

Test and certificate of specification conformance for each shipment shall be furnished from the manufacturer.

b. Where the total project requirement exceeds 200 barrels:

Tests shall be made on the entire cement requirement by an approved independent laboratory on car samples or bin (sealed) samples as may be required. ASTM Specification C-150 shall apply.

8. Fine Aggregate (For use in cement concrete)

Fine aggregate shall consist of natural river sand except that in special cases the Engineer may approve manufactured sand. <u>Sand mined from highland deposits will not be approved.</u>

a. Where the total project requirement is less than 100 tons:

Standard tests shall be made in advance, in the field or laboratory, for suitability per ASTM C-33, Paragraphs 2, 3, and 4, and ASTM C-40.

b. Where the total project requirement is 100 or more tons:

Standard tests shall be made in advance of concreting by an approved independent laboratory per ASTM C-33, Paragraphs 2, 3, 4, and 5, and ASTM C-40 on each fine aggregate proposed to be used. Other tests being satisfactory, the aggregate may be used pending results of 28-day mortar strength tests.

- 9. Course Aggregate (For use in cement concrete)
 - a. Where the total project requirement is less than 100 tons:

Standard tests shall be made in advance in the field or laboratory per ASTM C-33, Paragraphs 6, 7, and 8, except that gradation limits shall be as set out hereinafter in Section 3, "Concrete and Reinforcing Steel", of the Detailed Specifications.

b. Where the total project requirement is 100 or more tons:

Standard tests shall be made in advance of concreting by an approved laboratory on each grading of each coarse aggregate proposed to be used per ASTM C-33, Paragraphs 6, 7, 8, and 9.

10. Advance Tests of Concrete Design Mix(es)

Before commencement of concrete placing and after approval of cement and aggregates, an independent laboratory shall make from a single batch for each proposed mix a set of six (6) standard 6" cylinders per ASTM C-31 and cure in accordance therewith. Test two (2) cylinders at 7 days, two (2) cylinders at 14 days,

and two (2) cylinders at 28 days per ASTM C-39. Two (2) beam flexure tests as per ASTM C-78 shall likewise be made and tested from the design batch.

The requirements for tests may be modified at the Engineer's discretion without prejudice to his later requiring same (if he becomes in doubt about the quality of the concrete) if less than 50 cubic yards are required.

11. Reinforcing Steel

- a. A certificate of origin and affidavit will be required for all reinforcing steel. All reinforcing steel shall be <u>manufactured in the United States.</u>
- b. Where less than 25 tons are required:

Field inspection for section, rust, shape, and dimensions plus certified test report for heat number(s).

c. Where 25 or more tons are required:

Inspection and tests by an independent laboratory for conformance with governing specification.

d. Foreign Steel (defined as steel produced outside the United States):

Foreign Steel Will Not Be Allowed

12. Structural Steel

a. Where the requirement is less than 50 tons:

Visual inspection at the site and certified copies of mill test on heat number used in fabrication.

b. Where 50 or more tons are required:

Mill and shop inspection by an independent laboratory on each heat number to determine compliance with specification designated in the Detailed Specifications.

c. Foreign Steel

Foreign Steel Will Not Be Allowed

13. Steel Bar Joists

a. Where less than 400 joists are required:

There shall be furnished the manufacturer's test data proving the efficiency of the design of his joists for the purpose intended, and in addition, there shall be furnished certificates that the joists, as furnished, are in accordance with project requirements and with the Standard Specifications for Steel Joists as given in the current handbook "Steel Joist Construction" published by the Steel Joist Institute or other specifications designated in the Detailed Specifications.

b. Where 400 or more joists are required:

In addition to requirement (a) for less than 400 joists, there shall be furnished certificates of the manufacturer of the steel used in fabricating the joists that such steel conforms with the governing specifications.

c. Foreign Steel

Foreign Steel Will Not Be Allowed

14. Brick

a. Where less than 10,000 are required:

Visual inspection for shape, color, soundness, cracks, and other imperfections.

b. Where 10,000 or more are required:

Visual inspection as in (a) and absorption and flexure and compression tests as set forth in ASTM C-67 or other designated specification by an independent laboratory.

15. Building Stone

a. Where less than 5 tons are required:

Visual inspection for shape and color.

b. Where 5 tons or more are required:

Visual inspection as in (a) and tests as set forth in ASTM C-97 and C-170 or other designated specification by an independent laboratory.

16. <u>Vitrified Sewer Pipe</u>

a. Where less than 5,000 feet are required:

Visual inspection at the site per ASTM or other designated specification together with certified test reports from the supplier.

b. Where 5,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

17. Concrete Sewer Pipe (not reinforced)

a. Where less than 1,000 feet are required:

Visual inspection at the site, as practicable, per ASTM or other designated specification together with certified test reports from the supplier.

b. Where 1,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

18. <u>Concrete Sewer Pipe (reinforced)</u>

a. Where less than 1,000 feet are required:

Inspection at the site, as practicable, per ASTM or other designated specification plus certified test reports from the supplier.

b. Where 1,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other designated specification, by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

19. Cement-Asbestos Water and Sewer Pipe

a. Where less than 5,000 feet are required:

Inspection at the site, as practicable, per ASTM or other designated specification plus certified test reports from the supplier.

b. Where 5,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

20. Cast and Ductile Iron Pipe and Special Castings

a. Where less than 200 tons are required:

Each piece of pipe shall bear the manufacturer's name or trademark and the date cast. Each piece of pipe should be certified by the manufacturer to have met the requirements of the governing standard specifications. Also, each piece shall be visually inspected in the field for specification conformance.

b. Where 200 or more tons are required:

Inspection and testing at source, as set forth in ASTM or other designated specification by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

21. Grey Iron Castings

a. Field Inspection: For dimensions, coating, holes hammer test.

b. Laboratory Tests: Certified test reports by foundry.

22. Polyvinyl Chloride Water Pipe

a. Where less than 5,000 feet are required:

Inspection at the site, as practicable, per ASTM or other designated specification plus certified test reports from the supplier as performed by the manufacturer.

b. Where 5,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

The following tests shall be performed by an independent laboratory:

TEST	TEST METHOD	REQUIREMENT
Sustained Pressure Test	ASTM D-1598	420 psi for Class 200 (SDR 21) 650 psi for AWWA C900 (DR 14)
Quick Burst Test	ASTM D-1599	630 psi for Class 200 (SDR 21) 985 psi for AWWA C900 (DR 14)
Acetone Test	ASTM D-2152	20 minutes immersion with no flaking or degradation
Impact Test	ASTM D-2444	Class 200 (SDR 21) per ASTM D-2241; AWWA C900 (DR 14) shall not fail impact of 12 lb. missile with 2" radius nose falling from levels prescribed in ASTM D-2444. Sizes 4" through 12" shall pass impact of 120 ft/lbs.
Flattening Test	2" long sample ring compressed between parallel plates to 40% of outside diameter of pipe	No evidence of splitting, cracking, or breaking.

The results of all tests shall be reported to the Engineer.

23. Polyvinyl Chloride Sewer Pipe

a. Where less than 5,000 feet are required:

Inspection at the site, as practicable, per ASTM or other designated specification plus certified test reports from the supplier.

b. Where 5,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

The following tests shall be performed by an independent laboratory:

TEST	TEST METHOD	REQUIREMENT
Drop Impact Test	ASTM D-2444 Method D	ASTM D-3034
Flattening Test	6" long sample ring compressed between parallel plates to 40% of outside diameter of pipe	No evidence of splitting, cracking, or breaking.
Acetone Test	ASTM D-2152	20 minutes immersion with no flaking or degradation
Pipe Stiffness	ASTM D-2142	46 psi minimum stiffness (F/Ay) at 5% deflection for all pipe sizes

24. Acrylonitrile - Butadiene - Styrene (ABS) Composite Sewer Pipe

a. Where less than 5,000 feet are required:

Inspection at the site, as practicable, per ASTM or other designated specification plus certified test reports from the supplier.

b. Where 5,000 or more feet are required:

Inspection and testing, as set forth in ASTM or other specification designated in the Detailed Specifications by an independent laboratory for compliance with governing specification. Each length of pipe shall be inspected and stamped by a regular employee of the approved testing laboratory.

c. Testing shall be performed in accordance with the procedure outlined in ASTM D2412. Minimum "pipe stiffness" (F/Y) at 5% deflection shall be 200 psi or greater for all pipe sizes. The results of all tests shall be reported to the Engineer.

SECTION 3

CONCRETE AND REINFORCING STEEL

1. Scope

This Section covers the materials, mixing, transporting, finishing, and placing of all concrete and reinforcing steel including all labor, materials, and equipment.

a. Extent of the work

The extent of concrete work is shown on the drawings.

b. **Quality Assurance**

Comply with the provision of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:

- (1) ACI 301, Specifications for Structural Concrete for Buildings
- (2) ACI 302, Guide for Concrete Floor and Slab Placement
- (3) ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
- (4) ACI 305, Hot Weather Concreting
- (5) ACI 306, Cold Weather Concreting
- (6) ACI 315, Detailing Manual
- (7) ACI 318, Building Code Requirements for Reinforced Concrete
- (8) ACI 347, Recommended Practice for Concrete Formwork
- (9) CRSI Manual of Standard Practice

The Contractor is responsible for correcting concrete work that does not conform to the specified requirements, including requirements for strength, tolerances, and finishes. Correct deficient concrete as directed by the Engineer.

Employ at the Contractor's expense a testing laboratory acceptable to the Engineer to perform material evaluation tests and to design and review concrete mixes.

Materials and installed work may require testing and retesting, as directed by the Engineer, at any time during the progress of the work. Allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be done at the Owner's expense, including the retesting of rejected materials and installed work, shall be done at the Contractor's expense.

Test aggregates by the methods of sampling and testing outlined in ASTM C33.

For Portland cement, sample the cement and determine the properties by the methods of testing outlined in ASTM C150.

c. Submittals

Comply with applicable requirements of Section 1, "General Scope and Special Provisions".

For each material sampled and tested, submit written reports to the Engineer prior to the start of work. Provide the project identification name and number, date of report, name of Contractor, name of concrete testing service, source of concrete aggregates, materials manufacturer and brand name for manufactured materials, values specified in the referenced specification for each material, and test results. Indicate whether or not material is acceptable for the intended use.

Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement, reinforcing couplers, and forming accessories, admixtures patching compounds, waterstops, joint systems, curing and sealing compounds, and others requested by the Engineer.

Submit shop drawings for fabrication, bending, and placement of concrete reinforcement and couplers. Comply with the ACI 315, Detailing Manual, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Show on the shop drawings special reinforcement required and openings through concrete structures.

Submit 2 copies of laboratory test reports with standard deviation analysis or trial batch data. All concrete materials shall be listed.

2. Products

a. Forms for Exposed Finish Concrete: Unless otherwise specified or shown on the drawings, construct formwork for exposed concrete surfaces with plywood, or other panel type materials acceptable to the Engineer in order to provide exposed surfaces that are continuous, straight, and smooth. To minimize the number of joints and to conform to the joint system shown on the drawings, furnish panels in the largest practicable sizes. Provide form material that is thick enough to withstand pressure of newly placed concrete without bowing or deflection.

Forms For Unexposed Finish Concrete: For surfaces that will be unexposed in the finished structure, form concrete with plywood, lumber, metal, or other material acceptable to the Engineer. If lumber is used, it shall be dressed on at least two edges and one side for tight fit.

Form Coatings: Provide commercial formulation form coating compounds that will not bond with, stain, or adversely affect concrete surface and that will not impair subsequent treatments of concrete surfaces to be cured with water or curing compound.

b. Reinforcing Materials

- (1) Reinforcing Bar: ASTM A615, Grade 60
- (2) Welded Wire Fabric: ASTM A185, welded steel wire fabric
- (3) Welded Deformed Steel Wire Fabric: ASTM A497
- (4) Supports for Reinforcement: Provide supports for reinforcement, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Unless otherwise indicated on the drawings, use wire type bar supports complying with CRSI recommendations. Wood, brick, and other devices will not be acceptable. Comply with the following:
 - (a) For slabs on grade, where wetted base material will not support chair legs, use supports with sand plated or horizontal runners.

(b) For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip galvanized or protected by either plastic or stainless steel.

c. Concrete Materials

- (1) Portland Cement: ASTM C150, Type I. Use only one brand of cement throughout the project, unless otherwise acceptable to the Engineer.
- (2) Normal Weight Aggregates: ASTM C33, and as specified below:
 - (a) Local aggregates that do not company with ASTM C33 but that have been shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Engineer.
 - (b) Fine aggregate is to be clean, sharp, natural sand that is free from loam, clay, lumps, and other deleterious substances.
 - (c) Dune sand, bank run sand, and manufactured sand are not acceptable. However, crushed river gravel is acceptable.
- (3) Coarse Aggregate: Coarse aggregate shall consist of crushed stone that is clean, uncoated, and processed from natural rock or stone and that contains no clay, mud. loam, or foreign matter. Its maximum size shall be no longer than 1/5 of the narrowest dimension between sides of forms, 1/3 of the depth of slabs, or 3/4 of the minimum clear spacing between individual; reinforcing bars or bundles or bars.
- (4) Moisture Barrier: Provide moisture barrier cover under prepared base material where shown on the drawings. This barrier shall consist of polyethylene sheet that is not less than 6 mils thick, is resistant to decay when tested in accordance with ASTM E154, and has a certified water transmission rate of no more than 0.005 perms. Lap and tape all joints. Repair any tears. Note areas on the drawings where 3" of damp sand is required prior to concrete placement.
- (5) Water: Clean, fresh, drinkable.

(6) Admixtures

(a) Water Reducing Admixture: Eucon WR-75 by the Euclid Chemical Company, Pozzolith 200 N by Master Builders, or

Plastecrete 160 by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type A, and not contain more chloride ions than are present in municipal drinking water.

- (b) Water Reducing, Retarding Admixture: Eucon Retarder-75 by the Euclid Chemical Company, Pozzolith 100 XR by Master Builders, or Plastiment by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type D, and not contain more chloride ions than are present in municipal drinking water.
- (c) High Range Water Reducing Admixture (Superplasticizer): Eucon 37 by the Euclid Chemical Company or Sikament by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water. See Paragraph 3.f.
- (d) Nonchloride Accelerator: Accelguard 80 by the Euclid Chemical Company or Darex Set Accelerator by W. R. Grace. The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
- (e) Air Entraining Admixture: ASTM C260.
- (f) Calcium Chloride: Calcium chloride or admixtures containing more than 0.1% chloride ions are <u>not</u> permitted.
- (g) Pozzolanic Admixture: ASTM C618
- (h) Certification: Written conformance to the above mentioned requirements and the chloride ion content will be required from the admixture manufacturer prior to mix design review by the Engineer.

d. Related Materials

(1) Waterstops

Provide waterstops of either ethylene vinyl acetate, rubber, or PVC. See the drawings for location of each. Rubber units shall comply with Corps of Engineers CRD-C513 and PVC units with CRD-C572. Ethylene vinyl acetate units shall be a

closed cell, foamed, cross linked ethylene vinyl acetate/low density polyethylene copolymer. All waterstops called for as continuous 2" x 4" compression seal on the drawings shall be ethylene vinyl acetate.

Where waterstops are located between walls and foundations, use steel plate as detailed on the drawings.

- (2) Preformed Expansion Joint Fillers: Sponge rubber, ASTM D1752, Type I.
- (3) Joint Sealing Compound: 2 component polysulphide rubber complying with FS TT-S-227e, Type 2.
- (4) Moisture Retaining Covering: One of the following, complying with ASTM C171:
 - (a) 2.4.4.1 Waterproof paper
 - (b) 2.4.4.2 Polyethylene film
 - (c) 2.4.4.3 Polyethylene coated burlap
- (5) Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders. The compound shall conform to FS TT-C-800A, 30% solids content minimum, and have test data from an independent laboratory indicating a maximum moisture loss of 0.030 gram per square centimeter when applied at a coverage rate of 300 square feet per gallon. Manufacturer's certification is required.
- (6) Bonding Compound: Euco Weld by Euclid Chemical Company or Weldcrete by the Larsen Company. The compound shall be a polyvinyl acetate, rewettable type.
- (7) Epoxy Adhesive: Euco Epoxy No. 463 or No. 615 by Euclid Chemical Company or Sikadur Hi-Mod by Sika Chemical Corporation. The compound shall be a 2 component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces.
- (8) Nonshrink Grout: Firmix (metallic) or Euco NS (nonmetallic) by the Euclid Chemical Company or Embeco 153 (metallic) and Masterflow 713 (nonmetallic) by Master Builders. The grout shall conform to CRD-C-621-80, "Corps of Engineers

Specification for Nonshrink Grout". Nonmetallic grout shall be used where submerged or adjacent to water retaining structures.

e. <u>Mix Design</u>

(1) Preparation

Prepare design mixes for each type and strength of concrete in accordance with applicable provisions of ASTM C94. Use an independent testing facility acceptable to the Engineer for preparing and reporting proposed mix designs. The testing facility shall not be the same one used for field quality control testing unless this is acceptable to the Engineer. Submit to the Engineer written reports of each proposed mix for each class of concrete at least 15 days before the start of work. Do not begin concrete production until the Engineer reviews the mixes.

The design mix shall provide normal weight concrete with 28 day compressive strength as follows.

Class "A" Concrete: f 'c=4000 psi. All concrete shall be Class "A" except as noted on the drawing or as follows.

Class "C" Concrete: f 'c=2500 psi. Use for anchors, kickers, encasement of pipe, fill and as noted on drawings.

(2) Adjustment to Concrete Mixes; The Contractor may request adjustments to the mix design when warranted by the characteristics of the materials, job conditions, weather, test results, or similar circumstances. Such adjustments shall be made only if approved by the Engineer and at no additional cost to the Owner. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Engineer before the revised mix design is used in the work.

(3) Admixtures

All concrete shall contain the specified water reducing admixture and/or high range water reducing admixture (superplasticizer). All concrete slabs placed at air temperatures below 50 degrees F shall contain the specified nonchloride accelerator. All concrete, architectural concrete, concrete for industrial slabs and parking decks, and concrete with a water/cement ratio below 0.50 shall contain the

specified high range water reducing admixture (superplasticizer). Use an air entraining admixture in all concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure:

2.5% to 5.5% for maximum 2" aggr 4.5% to 7.5% for maximum 3/4" aggr 5.5% to 8.5% for maximum 1/2" aggr

Water/Cement Ratio: All concrete exposed to freezing and thawing shall have a maximum water/cement ration of 0.50. All concrete subjected to deicers and/or required to be watertight shall have a maximum water/cement ratio of 0.45.

Use the amounts of admixtures recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

(4) Slump Limits

All concrete containing the high range water reducing admixture (superplasticizer) shall have a maximum slump of 8" unless otherwise approved by the Engineer. The concrete shall arrive at the job site at a slump of 2" to 3" and be verified; then the height range water reducing admixture shall be added to increase the slump to the approved level.

All other concrete shall have a maximum slump of 3" for slabs and 4" for other members.

f. <u>Proportioning</u>

(1) Job Site Mixing

Mix materials for concrete in an acceptable drum type batch machine mixer. For mixers with a capacity of one cubic yard or less, continue mixing at least 1-1/2 minutes but not more than 5 minutes after all ingredients are in the mixer before any part of the batch is released. For mixers with a capacity of more than one cubic yard, increase the minimum mixing time of 1-1/2 minutes by 15 seconds for each additional cubic yard of capacity or fraction thereof.

For each batch discharged and used in the work, provide a batch ticket indicating the project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

(2) Ready Mix Concrete

Comply with the requirements of ASTM C94 and of these specifications.

During hot weather or under conditions that contribute to rapid setting of concrete, a shorter mixing time than that specified in ASTM C94 may be required. When the air temperature is between 85 and 90 degrees F, reduce the mixing and delivery time from 1-1/2 hours to 75 minutes; when the air temperature is above 90 degrees F, reduce the mixing time to 60 minutes.

Each load of concrete arriving at the job shall be accompanied by a delivery ticket that shall be collected by the Contractor and submitted to the Engineer and shall contain the following information:

The design mix and strength of mix of concrete being delivered.

The exact time the cement, aggregate, and water were discharged into the delivery truck.

3. Execution

a. Forms

Design, erect, support, brace, and maintain formwork to support any vertical and lateral loads that may be applied until such loads can be supported by the concrete structure. Construct formwork so that concrete members and structures are of correct size, shape, alignment, elevation, and position.

Design formwork so that it can be readily removed without impact, shock, or damage to cast in place concrete surfaces and adjacent materials.

Construct forms complying with ACI 347 to the sizes, shapes, lines, and dimensions shown on the drawings so that in the finished structures the work will be level and plumb and have accurate alignment, location and grade. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustication, reglets, chamfers, blocking, screeds, bulkheads, anchorages, inserts, and other features that the work requires. Use selected materials to obtain the required finishes. Butt joints solidly, and provide backup at joints to prevent leakage of cement paste.

Fabricate forms so that they can be easily removed without hammering or prying against the concrete surfaces. Provide crush plates or wrecking

plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where the slope is too steep for the concrete to be placed with bottom forms only. To form keyways, reglets, recesses, and the like, kerf wood inserts to prevent swelling and to permit easy removal.

Where the interior area of formwork is not accessible for cleanout, provide temporary openings to permit concrete placement and inspection before the concrete is placed. Brace temporary openings securely and set them tightly to forms to prevent the loss of concrete mortar. Position temporary openings on forms at inconspicuous locations.

Chamfer exposed corners and edges as shown on the drawings, using wood, metal, PVC or rubber chamfer strips fabricated to produce smooth, uniform lines and tight edge joints.

Use metal form ties that are factory made, adjustable in length, designed to prevent form deflection, and either removable or snap-off and that will prevent the concrete surface's being spalled when the ties are removed. If snap-off ties are used, the portion remaining within the concrete after removal must be at least 1-1/2" inside the concrete unless the drawings indicate otherwise. All liquid retaining structures shall have water sealing form ties.

Unless the drawings indicate otherwise, provide form times that will not leave holes larger than 1-1/2" in diameter in the concrete surface.

Provide openings in concrete formwork to accommodate the work of other trades. Determine the size and location of openings, recesses, and chases from the trades providing such work. Accurately place and securely support items built into forms.

Clean thoroughly forms and adjacent surfaces that are to receive concrete. Remove chips, wood, sawdust, dirt, and any other debris just before the concrete is placed. After concrete placement, retighten forms if necessary to eliminate mortar leaks.

b. <u>Placing Reinforcement</u>

For details and methods of placing reinforcement and supports, comply with the specified codes and standards, the recommended practice of the CRSI as outlined in "Placing Reinforcing Bars", and these specifications.

Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials that reduce or destroy the bond with concrete.

Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcement with metal chairs, runners, bolsters, spacers, and hangers as required for security.

Place reinforcement to obtain at least the minimum coverage for concrete protection as required by ACI 318. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so that ends are directed into the concrete, not toward exposed concrete surfaces.

Do not place reinforcing bars more than 2" beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment or similar construction loads.

Install welded wire fabric in lengths that are as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

c. Joints

Locate and install construction joints (which are not shown on the drawings) as approved by the Engineer so that the strength and appearance of the structure will not be impaired.

Provide keyways at least 1-1/2" deep in construction joints that are in walls and slabs or between walls and footings. Bulkheads designed for this purpose may be used if accepted by the Engineer. Omit keyways where steel waterstops are shown between walls and footings. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints of structural members.

Provide waterstops in construction joints as shown on the drawings. Install waterstops to form a continuous diaphragm in each joint. Make provisions to support and protect waterstops during the progress of the work. Fabricate field joints in waterstops in accordance with the manufacturer's printed instructions. Protect waterstop material from damage if it protrudes at any point.

Construct isolation joints in slabs on the ground wherever there is contact between slabs on the ground and vertical surfaces and wherever else indicated on the drawings.

Install joint filler and sealant materials as specified by the manufacturer.

Construct contraction (control) joints in slabs on ground to form panels of patterns as shown. Use saw cuts or approved inserts creating a plane of 1/4 slab thickness.

Make saw cuts as soon as possible after final finishing without dislodging the aggregate.

Form contraction joints by inserting an approved plastic strip into the fresh concrete until the top surface of the strip is flush with the slab surface. Before the concrete is floated, remove the top strip.

Install joint sealant material as specified by manufacturer. The maximum joint spacing of slabs on grade shall be 20' unless shown otherwise on the drawings or otherwise approved by the Engineer.

d. Installation of Embedded Items

Set and build into the work anchoring devices and other embedded items required for other work that are to be attached to or supported by cast in place concrete. Use setting drawings, diagrams, instruction, and directions provided by the suppliers of the items to be attached thereto.

Set edge forms or bulkheads and intermediate screed strips for slabs in order to provide the elevations and contours in the finished slab surface required by the drawings. Provide units strong enough to support the types of screed strips used, and secure with strike-off templates or compacting screeds accepted by the Engineer.

e. Preparation of Form Surfaces

Before placing reinforcement, coat the contact surfaces of forms with a form coating compound.

Thin the form coating compound only with the amount and type of thinning agent and only under the conditions recommended by the compound manufacturer. Do not allow excess form coating material to accumulate in the forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply the form coating compound with the manufacturer's instructions.

Coat steel forms with a nonstaining, rust preventative form oil, or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

f. Concrete Placement

Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades

that the formwork is complete so that they may then install their work; cooperate with other trades in setting such work. Wherever form coatings are not used, wet wood thoroughly just before placing concrete.

Coordinate the installation of joint materials and moisture barriers with the placement of forms and reinforcing steel.

Deposit concrete either continuously or in layers thick enough to prevent its being placed on concrete that has hardened enough to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as close to its final location as practicable in order to avoid segregation due to rehandling or flowing.

Deposit concrete in forms in horizontal layers no deeper than 24" and in a manner that avoids inclined construction joints. Where placement consists of several layers, avoid cold joints by placing each layer while the preceding one is still plastic.

Use mechanical vibrating equipment supplemented by hand spading, ridding, or tamping to consolidate placed concrete. The equipment and procedures used to consolidate the concrete shall comply with the recommended practices of ACI 309 and suit both the type of concrete and project conditions. Provide standby mechanical vibrating equipment at all concrete placements.

Do not use vibrators to transport concrete once it is inside the forms. Insert and withdraw vibrators vertically at uniformly spaced locations no further apart than the visible horizontal effectiveness of the machine. Limit layer heights so that the vibrator is effective into 6" of the preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit the duration of vibration to the time necessary to consolidate the concrete, and complete embedment of reinforcement and other embedded items without causing segregation of the mix. Lower frequency vibrators may be used with "flowing" concrete.

Until the placing of a panel or section is completed, deposit and consolidate concrete slabs in a continuous operation within construction joints.

Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.

Bring slab surfaces to the correct level with a straight-edge and strike off. Use bull floats or darbies to smooth the surface, leaving it free from humps and hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces before starting finishing operations.

Maintain reinforcement in the proper position during placement operations.

Cold Weather Placement

- (a) Comply with ACI 306 and the requirements herein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.
- (b) When the air temperature has fallen or is expected to fall below 40 degrees F, heat all water and aggregates uniformly before mixing so that the concrete, at point of placement, will have a temperature of not less than 50 degrees nor more than 80 degrees F.
- (c) Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade containing frozen subgrade or on subgrade containing frozen materials.
- (d) Use only the specified nonchloride accelerator. Do not use calcium chloride or admixtures containing more than 0.1% chloride ions.

Hot Weather Placement

When the weather is hot enough to impair seriously the concrete's quality and strength, place the concrete as specified herein and in ACI 305.

- (a) Cool ingredients before mixing so that when the concrete is placed, its temperature is below 90 degrees F. Mixing water may be chilled, or else a portion of the water may be in the form of chopped ice.
- (b) If reinforcing steel becomes hotter than the ambient air temperature, cool it with water soaked burlap so that its temperature will not exceed the ambient air temperature.
- (c) When high temperatures and/or placing or humidity conditions dictate, the mix may be initially retarded by use of the water reducing, retarding formulation (Type D) of the specified water reducing admixture (Type A).

Water Retaining Structures: Superplasticizers (see Paragraph 2.C.6.C) shall be used in all water retaining structures. Use according to the manufacturer's recommendations.

g. Finish of Formed Surfaces

Rough Form Finishes: For formed concrete surfaces not exposed to view in the finished work or covered by other construction, use a rough form finish unless otherwise indicated by the drawings. Repair and patch tie holes and defective areas, and rub down or chip off fins and other projections more than 1/4" high.

Rubbed Finish: At all formed surfaces exposed inside and outside the building, apply rubbed finish as follows:

- (a) Surface irregularities shall not exceed 1/8" in 5' for gradual irregularities nor 1/16" for abrupt irregularities. Fill over any air pockets or void over 1/8" in width, and surface smoothly.
- (b) Perform finishing after all required patching and corrections of major imperfections have been completed, and complete within 24 hours after forms are stripped.
- (c) Thoroughly wet the surfaces, and begin finishing while they are still damp.
- (d) The mortar shall consist of 1 part cement, 2 parts sand (by dry volume) passing a No. 16 screen, the bonding admixture SBR Latex by the Euclid Chemical Company, and enough water to produce a mortar the consistency of thick paint.
- (e) Apply the mortar by rubbing thoroughly over the surface, using a burlap or sponge rubber float, to fill all pits thoroughly. While the mortar in the pits is still plastic, rub over the surface with a dry mix of the above proportions and material to remove the excess material and to stiffen the mortar in the pits. After the mortar has thoroughly hardened, wipe it with clean burlap to remove all surface mortar completely. The entire operation for any area must be completed the day it is started.

Related Uniform Finishes: At the tops of walls, horizontal offsets, and similar unformed surfaces that are next to formed surfaces, strike off smooth and finish with a texture that matches the adjacent formed surfaces. Unless otherwise shown on the drawings, continue the final surface treatment of formed surfaces uniformly across adjacent unformed finishes.

Float Finish

- (a) Apply float finish to monolithic slab surfaces that are to receive a trowel finish or other finishes specified hereinafter; to slab surfaces that are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand bed terrazzo; and as otherwise indicated by the drawings or schedules.
- (b) After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened enough to permit the operation of power driven floats or by hand floating if the area is small or inaccessible to power units. Check and level the surface plane so that depressions between high spots do not exceed 5/16" under a 10' straight-edge.

Trowel Finish

- (a) Apply a trowel finish to monolithic slab surfaces that are to be exposed to view, unless otherwise indicated by the drawings, and to slab surfaces that are to be covered with resilient flooring, paint, or other thin-film finish coating.
- (b) After the slab has received a floated finish, begin first trowel finish operation using a power driven trowel. Begin final troweling when the surface produces a ringing sound as the trowel is moved over it. Consolidate the concrete surface by a final hand troweling until it is free of trowel marks, is uniform in texture and appearance, and has a level surface so that depressions between high spots do not exceed 3/16" under a 10' straight-edge. Grind smooth any surface defects that would telegraph through the applied floor covering.

"Dry Shake" Finish: If a "dry shake" application of a selected metallic or mineral aggregate is specified, blend the aggregate, selected or approved by the Engineer, with portland cement in the proportions recommended by the manufacturer of the aggregate. Give the surface a float finish as specified above. Apply approximately 2/3 of the blended material for required coverage to the surface by a method that ensures even coverage without segregation. Floating shall begin immediately after application of the first "dry shake". After this material has been embedded by floating, apply the rest of the blended material to the surface at right angles to the previous application. The second application shall be heavier in any areas not sufficiently covered by the first application. A second floating shall follow immediately. After the selected material has been embedded by the 2 floatings, complete the operation with a broomed, floated, or troweled finish, as designated in the contract documents.

Nonslip Finish: Where the contract documents require a nonslip finish, give the surface a "dry shake" application, as specified above, of crushed ceramically bonded aluminum oxide or other specified selected abrasive particles. The rate of application of such material shall not be less than 25 pounds per 100 SF.

h. <u>Sealer/Dustproof Finish</u>

Apply a second coat of the specified curing and sealing compound to interior concrete floors where shown on the drawings or in schedules. The compound shall be applied in strict accordance with the directions of the manufacturer and just prior to completion of construction.

After placing and finishing the concrete, start initial curing as soon as free water has disappeared from concrete surface. Keep continuously moist for not less than 7 days.

Begin final curing immediately after initial curing and before the concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301. Avoid rapid drying at the end of the final curing period.

Cure concrete by moist curing, moisture retaining cover curing, membrane curing, or combinations of these methods, as specified herein.

Provide moisture curing by one of the following methods:

- (a) Keep concrete surface continuously wet by covering with water.
- (b) Spray it continuously with a water fog.
- (c) Cover the concrete surface with the specified absorptive cover, thoroughly saturating the cover with water and keeping it wet; position the absorptive cover so that it covers the concrete surface and edges and laps adjacent absorptive covers by 4".

Provide moisture cover curing by covering concrete surfaces with a moisture retaining cover designed for curing concrete. Place the cover in the widest practicable width of material with sides and ends of the material lapped at least 3" and sealed by waterproof tape or adhesive. Repair immediately any holes or tears that occur during the curing period with identical cover material and waterproof tape.

Provide membrane curing to slabs as follows: All interior slabs that have resilient tile or carpet or are left exposed and all exterior slabs, sidewalks, curbs, etc., shall be cured with the specified <u>clear</u> curing and sealing compound. The compound shall be applied immediately after final finishing operations are completed. Apply uniformly in a continuous operation by power spray or roller in accordance with the manufacturer's directions. Areas that are subjected to heavy rainfall within 3 hours after initial application shall be recoated. Maintain continuity of coating, and repair damage during the curing period.

Cure formed concrete surfaces (including undersides of beams, supported slabs, and other similar surfaces) by moist curing with forms in place for the full curing period or until the forms are removed. If forms are removed, continue curing by the methods specified above, as applicable.

Cure unformed surfaces such as slabs, floor topping, and other flat surfaces by the application of the specified curing and sealing compound or by a moist curing method approved by the Engineer.

i. Removal and Reuse of Forms

Formwork not supporting weight of concrete (e.g., sides of beams, walls, columns, and similar parts of the work) may be removed after curing at a temperature of not less than 50 degrees F 24 hours after the concrete is placed, provided the concrete is hard enough not to be damaged by form removal operations and provided curing and protection operations are maintained.

Formwork supporting weight of concrete (e.g., beam soffits, joints, slabs, and other structural elements) may not be removed for at least 14 days nor until the concrete has attained a design minimum compressive strength of inplace concrete by testing the field cured specimens representative of the concrete location or members.

Form facing material may be removed 4 days after concrete placement only if shores and other vertical supports have been arranged to permit it to be removed without loosening or disturbing shores and supports.

Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form facing materials will not be acceptable. Apply new form coating compound material to concrete contact form surfaces as specified above for new formwork.

When forms are extended for successive concrete placement, clean surfaces thoroughly, remove fins and laitance, and tighten forms to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces, except as acceptable to the Engineer.

j. Miscellaneous Concrete Items

Filling In: Unless the drawings show otherwise or the Engineer directs, fill in holes and openings left in concrete structures for the work of other trades once that work is in place. Mix, place, and cure concrete as specified herein to blend with in-place construction. Provide other miscellaneous concrete filling shown on the drawings or necessary to complete the work.

Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on the drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with the certified diagrams or templates of the manufacturer furnishing the machines and equipment.

Nonshrink Grout: All column base plates, equipment bases, and other locations noted on the structural drawings shall be grouted with the specified nonshrink grout. All exposed grout shall be of the specified nonmetallic type.

Reinforced Masonry: Provide concrete grout for reinforced masonry lintels and bond beams where indicated on the drawings and as scheduled. Maintain accurate location of reinforcing steel during concrete placement.

k. <u>Concrete Surface Repairs</u>

Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to the Engineer.

Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts down to solid concrete, but in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Before placing cement mortar, thoroughly clean, dampen with water, and apply the specified bonding compound. The cement mortar shall be placed after the bonding compound has dried.

Remove and replace concrete with defective surfaces if these effects cannot be repaired to the satisfaction of the Engineer. Such surface defects include irregularities of color and texture, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, and fill with dry pack mortar or with precast cement cone plugs secured in place with bonding agent.

Where possible, repair concealed formed surfaces that contain defects which adversely affect the durability of the concrete. If such defects cannot be repaired, remove and replace the concrete.

Test unformed surfaces such as monolithic slabs for smoothness and to verify that the surface plane meets the tolerances specified for each surface and finish. Correct low and high areas as specified herein. Test unformed surfaces sloped to provide drainage for both trueness of slope and smoothness with a template of the slope specified above.

Repair finished unformed surfaces that contain defects which adversely affect durability of the concrete. Such surface defects include crazing, spalling, pop-outs, honeycomb, rock pockets, cracks that are more than 0.01" wide or that, regardless of width, penetrate either to reinforcement or completely through unreinforced sections, and other objectionable conditions.

After the concrete has cured at least 14 days, correct high areas in unformed surfaces by grinding.

Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting them out and refilling with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to the Engineer.

Repair defective areas (except for random cracks and single holes not more than 1" in diameter) by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts, and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete after the bonding compound has dried. Mix patching concrete of the same materials to provide concrete of the same type or class as with original concrete. Place compact, and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

Repair isolated random cracks and single holes not over 1" in diameter by the dry pack method. Groove top of cracks, cut out holes until sound concrete is reached, and clean to remove dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply the specified bonding compound. Place dry pack after the bonding compound has dried. Dry pack shall consist of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve. Mix with no more water than is necessary for handling and placing. Compact dry pack mixture in place, and finish to match adjacent concrete. Keep patched area continuously moist for no less than 72 hours.

All structural repairs shall be made, with prior approval of the Engineer as to the method and procedure, using the specified epoxy adhesive and/or epoxy mortar.

Repair methods not specified above may be used, subject to acceptance by the Engineer.

I. Quality Control Testing During Construction

The Contractor shall employ a testing laboratory to perform the tests specified below and to submit reports on these tests.

- (1) Sampling Fresh Concrete: ASTM C172, but modified for slump to comply with ASTM C94.
- (2) Slump: ASTM C143, one test for each concrete load at point of discharge and one test of each set of compressive strength test specimens.
- (3) Air Content: ASTM C173 volumetric method for light-weight concrete; ASTM C231 pressure method for normal weight concrete; one test for each set of compressive strength test specimens.
- (4) Concrete Temperature: Test hourly when air temperature is 40 degrees F and below or when 80 degrees F and above and each time a set of compression test specimens is made.
- (5) Compression Test Specimens: ASTM C31; one set of 6 standard cylinders for each compressive strength test, unless otherwise directed by Engineer. Mold and store cylinders of laboratory cured test specimens except when the Engineer requires field cured test specimens.
- (6) Compressive Strength Tests: ASTM C39; one set for each 100 cubic yards or fraction thereof of each concrete class placed in any one day or one set for each 5,000 square feet of surface area placed; 2 specimens tested at 7 days, 3 specimens tested at 28 days, and 1 specimen retained in reserve for later testing, if needed.

When the frequency of testing provides less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or, if fewer than 5 are used, from each batch.

When the total quantity of a given class of concrete is less than 50 cubic yards, the strength test may be waived by the Engineer if, in his judgement, adequate evidence of satisfactory strength is provided.

The strength level shall be considered satisfactory as long as the average of all sets of 3 consecutive strength test results equal or exceed the specified strength f 'c, and no individual test result falls below the specified strength f 'c by more than 500 psi.

When the strength of field cured cylinders is less than 85% of companion laboratory cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

Test results will be reported to the Engineer and Contractor in writing on the same day that the test is made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and material and compressive breaking strength and type of break for both 7 day tests and 28 day tests.

The testing service will make additional tests of in-place concrete when the test results indicate that the required strength level has not been achieved and other characteristics have not been attained in the structure, as directed by the Engineer. The testing service may conduct tests to determine the adequacy of concrete by cored cylinders that comply with ASTM C42 or by such other methods as are directed by the Engineer. The Contractor shall pay for such tests and any additional testing may be required when concrete is verified to be unacceptable.

Hydrostatic Testing: Concrete structures that are to contain water, sludge, or other liquid, such as settling or digestion tanks, coagulation basins, reservoirs, filter basins, and similar structures, shall be hydrostatically tested for leakage. Testing shall consist of filling each structure with water so that the Engineer can inspect and observe any leaks when the structure has been full of water from 24 to 48 hours. When practical, make such tests before backfill is placed around the structure. If the test is made after backfilling is complete, mark the water level in the structure and monitor for 72 hours to see if there is any loss of water. Repair all leaks in the structure in an approved manner. Patching or caulking or any other method of repair on the outside or dry side of walls will not be permitted. Damp areas or spots on permanently exposed walls, such as in filter galleries, will be considered leaks.

SECTION 4

SITE PREPARATION AND DEVELOPMENT

1. Scope

The work covered by this Section consists of furnishing all materials and equipment and performing all labor necessary for Site Preparation and Development for the Waste Water Treatment System as described in Section I which includes but is not limited to clearing, excavating, construction embankments, backfilling, grading, grassing, draining, and all incidentals as shown on the Plans.

2. Site Conditions

The Contractor affirms by the submission of his bid that he has examined the location of the work and has informed himself fully as to the site conditions, the configuration of the ground, the character, quality and quantity of the materials to be encountered, the equipment and facilities needed preliminary to and during the prosecution of the work, the general and local conditions, and all other matters which can in any way affect the work to be done.

3. Clearing and Stripping Topsoil

The site shall be cleared of all obstructions interfering with the construction of new work. The area within the site as shown on the Plans shall be cleared of all materials which will interfere with construction.

The Contractor shall strip the entire area within cut, fill and graded areas to remove all topsoil, vegetable matter, stumps, roots, and other objectionable materials. Topsoil and vegetable matter shall be carefully stockpiled and preserved for reuse. Roots and stumps shall be grubbed out and burned or removed from the property entirely. The base of all embankments and fills shall be scarified and rolled so that the base will be well bonded with the first layers of fill.

4. Excavation

a. <u>General</u>

The Contractor shall perform all excavating of every description, and of whatever substance encountered, to the dimensions and levels shown on the Plans, and/or specified. Excavation may be accomplished by any customary method, unless otherwise specified.

b. Rock

Rock excavation shall be defined as solid rock in the original bed or in well defined ledges, the removal of which in the opinion of the **Engineer requires drilling, blasting or the use of jack hammers and bull points**, and shall also include all boulders and detached pieces or rock containing twelve (12) cubic feet and more. All loose, weathered, or disintegrated rock unsuitable for foundations shall be excavated to solid rock. Special care shall be taken during blasting and excavating so as not to disturb any rock on which foundations are to be placed. Before placing concrete foundations on rock surfaces, the surface shall be thoroughly cleaned and inspected by the Engineer. The Contractor shall drill test holes at the locations shown on the Plans or designated by the Engineer, to prove the integrity of the rock foundations. Drilled test holes shall be filled with grout unless they are used as "hold down anchors".

c. Blasting

All blasting operations shall be conducted in accordance with existing ordinances and regulations, and shall be done **subject to the Engineer's approval** of the method and quantity of explosive to be used. The approval of the Engineer will be tacit and shall in no way relieve the Contractor of complete responsibility. The Contractor shall maintain a current log of his blasting operations including therein the amounts of the explosive used, the time of detonation and the location involved. Exposed structures shall be protected from the effects of blasts and blasts shall be covered with suitable mats and shall be restricted to the extent that no appreciable shock will be transmitted to existing structures, pipe lines, sewers or other public or private facilities. All blasting supplies shall be stored in accordance with existing ordinances and laws.

d. Limits

Excavations shall be made for a sufficient distance outside foundation walls to allow for inspection and to permit the various trades to install their work.

Excavations for walls shall be carried a minimum of two feet outside the wall. Excavation for piers shall be at least two feet greater than the dimensions of the piers. Excavation for footings shall be to the footing dimensions.

e. Depth

Care shall be taken that excavation does not extend below the exact lines of the sub-foundations, footings and floor slabs on earth or rock. Should the excavation, through carelessness or negligence on the part of the Contractor, be carried below such lines, the Contractor shall fill in the resulting excess excavation with Class "C" concrete and or compacted crushed stone as directed by the Engineer. This work shall be done at the Contractor's expense.

f. Removal of Water

The Contractor shall make use of well points, pumps, or other approved methods to prevent the accumulation of water in excavated areas. Should water accumulate, it shall be promptly removed. The Contractor shall also provide for dewatering areas adjacent to structures to prevent uplift during construction. The Contractor will be held responsible for any damage due to uplift of such structures during construction.

5. Embankments and Backfilling Around and Under Structures

a. General

All embankments and backfills around structures shall be selected materials properly placed in layers. The layers shall be thoroughly compacted to a solid homogeneous mass having at least 95% of maximum theoretical density as determined by method A ASTM D-698. The compacted thickness of each layer shall not exceed six (6) inches.

Compaction of yard fills shall be accomplished by rolling with a sheep's foot roller until the roller "walks-out".

Compaction around structures and pipe lines shall be by use of heavy power tamping equipment. Selected materials shall be used for backfill around pipe in pipe trenches.

The sheep's foot roller shall be of self-cleaning type with feet projecting seven (7) inches from the shell and/or such weight that the load on each tamper foot with the drum empty will not be less than 100 pounds per square inch of area in contact with a plane surface. Rolling shall be carried on until the feet will have no appreciable imprint when the shell is at a maximum weight.

Pneumatic tired rollers shall be suitable for ballast loading which will give a minimum compression under working conditions of 325 pounds per inch width of tire tread. Forward and rear tires shall make separate tracks. Compaction shall be equivalent to that required for the sheep's foot roller.

b. Structures on Earth

Where structures rest on earth, all loam, organic, or other undesirable material shall be removed as required by the Engineer. When filling is required to bring such excavated area to the levels required to receive structures, the fill shall be compacted by tamping and rolling to obtain 98% of maximum density as per ASTM D-698 Method A. Layers shall not be more than six (6) inches thick.

c. Crushed Stone (Furnas Curve)

Where shown on the Plans or otherwise required under structures, the Contractor shall place and compact crushed stone in six-inch or thinner layers. Materials shall meet the same requirements as those given for concrete except gradation. Gradation shall approximate a Furnas maximum density curve which is as follows and shall be approved by the Engineer:

<u>Screen</u>	Percent Passing	
1-1/2	100	
4	32-48	
16	15-25	
30	10-18	
100	2-8	

6. <u>Borrow Material</u>

If borrow material is required, it shall be the responsibility of the Contractor to arrange for a source of suitable backfill material.

7. <u>Disposition of Excavated or Waste Material</u>

All excavated material not needed for backfilling purposes shall be hauled away unless an area for disposal is indicated on the Plans. The Contractor is responsible for the disposal of all excess material regardless of quality.

All materials resulting from clearing operations shall be burned or otherwise disposed of in a satisfactory manner. Materials to be burned shall be neatly piled, and when in a suitable condition, shall be completely burned. Precautions shall be taken to avoid damage to remaining trees and/or adjacent property. Any burning must be conducted in accordance with all applicable statutes and codes.

8. Finish Grading and Topsoiling

Finish grading shall be performed in accordance with the finished elevations and grades shown on the Plans and shall be made to blend into conformation with remaining natural ground surfaces. All finished grading surfaces shall be left smooth and free to drain. Selected materials, which have been obtained from stripping the site, shall be spread upon the slopes of fills and other areas to a uniform depth and compacted suitable for planting. Excess materials shall be spread and compacted as directed. The top four to six inches of material in areas to be grassed shall be topsoil.

9. <u>Seeding</u>

The areas disturbed by construction which are not a part of pavements shall be seeded in accordance with the requirements below. Roadway shoulders which were crushed stone or receive crushed stone are considered as pavements.

All disturbed areas shall be left smooth and thickly sown with a mixture of Blue Grass, Italian Rye Grass, Kentucky Fescue #31 and/or such other grasses as are specified by the Engineer (in pastures etc., the property owner's preference of grasses shall be used). When the final grading has been completed, the entire area to be seeded shall be fertilized with ammonium nitrate at the rate of 5 lbs. per 1000 square feet and an approved commercial fertilizer at the rate of 10 lbs. per 1000 square feet. The analysis of the commercial fertilizer shall be determined by soil tests. After the fertilizer has been distributed, the Contractor shall rake or harrow the ground to thoroughly work the fertilizer into the soil. The seed shall then be sowed in two (2) operations broadcast either by hand or by approved sowing equipment. The application shall be 30 pounds per acre for each operation. If the Engineer determines to use "hulled" or "unhulled" Bermuda, the application rate shall be 7 lbs. per acre. After the seed has been distributed, the Contractor shall then lightly cover the seed by use of a drag or other approved device. All seed shall be certified not more than three (3%) percent weed. The seeded area shall then be covered with straw at the rate of 1-1/2 tons per acre.

Any necessary reseeding or repairing shall be accomplished by the Contractor prior to final acceptance. If the construction work is brought to completion when, in the opinion of the Engineer, the season is not favorable for the seeding of the grounds, then the Contractor shall delay this item of work until the proper season for such seeding as directed by the Engineer.

All planting and seeding shall be watered thoroughly as soon as completed and shall be watered twice daily or more often if necessary until all growth is thoroughly established.

Seeding is **not** a separate pay item.

10. Fencing

Fencing shall be placed as shown on the plans. The material for the fences and gates shall be noted in the following paragraphs.

a. Fabric

Galvanized after woven, chain link copper bearing steel, No. 6 or No. 9 wire (as shown), two (2) inch mesh with wire finish at top and bottom end of a normal fabric width of six (6) feet, eight (8) feet, or ten (10) feet as required.

b. <u>Post, Top Rail, Braces and Gate Frames</u>

All structural members shall be galvanized copper bearing steel pipe. Type SS-40. Sizes shall be shown on the Plans.

c. Tension Wire

Tension wire shall be No. 7 gauge, double galvanized copper bearing steel wire.

d. Post Setting

All posts shall be set three (3) feet in a concrete base of proper size and shape to furnish sufficient foundation.

e. Gate

Gate shall be of the size shown on the plans, with frame filled with fabric of the same specifications as used in line of fence. Gate to be equipped with off-set hinges and latch for padlock arrangement. Padlock furnished by Owner. Gate post to be same size as corner post for the height of fence.

11. Landscaping

A landscaping plan is shown in the Plans which shows all trees and shrubs to be planted upon completion of grading and seeding. All trees and shrubs shall be fertilized and watered and shall be guaranteed to live until one year after the date of the <u>final</u> inspection.

Landscaping is not a separate pay item.

SECTION 5

PIPING, FITTINGS, VALVES, GATES AND ACCESSORIES

1. Scope

The work to be performed under this Section consists of furnishing all materials and equipment and performing all labor for the construction of the various site piping systems as shown on the Plans and as required for proper operation of the equipment.

2. <u>Shop Drawings, Service & Tools</u>

Shop drawings, in accordance with the requirements of Section 1 of the Detailed Specifications, shall be furnished for each and every item specified in this Section. Layouts of all piping systems shall be furnished and approved prior to fabrication.

The Contractor's responsibility for properly installing materials and equipment specified in this Section of the Specifications includes providing the services of factory representatives to supervise the installation and/or start up of any items for which such service may be required.

Two valve wrenches, levers, etc., shall be supplied for each type and size valve, hydrant or other device specified herein requiring such a device for opening and closing.

3. Ductile Iron Pipe and Fittings

a. Inside Pipe and Fittings

1) <u>Ductile Iron Pipe</u>

Ductile iron pipe shall be designed in accordance with ANSI A-21.51 (AWWA C-151). The pipe shall contain an approved cement lining in accordance with ANSI A-21.4 (latest revision) on the inside and shall be shop primed on the outside with Koppers primer #621. All inside ductile iron pipe shall be flanged, centrifugally cast, Class 53, unless otherwise shown on the Plans, with flanges faced and drilled in accordance with ANSI A-21.10 (AWWA C-110), Class 125 and manufactured in accordance with ANSI A-21.51 (AWWA C-151).

Gaskets for flanged pipe and fittings shall be 1/16" thick ring gaskets of full face red sheet rubber, cloth inserted rubber, or asbestos composition. Machine bolts and bolt studs shall conform to ANSI B-16.1.

2) <u>Ductile Iron Fittings</u>

All ductile iron flanged fittings 3 inches and larger shall be manufactured in accordance with AWWA C-110 and C-111 and shall have Class 125 flanges faced and drilled in accordance with ANSI A-21.10. Fittings shall contain standard thickness cement lining in accordance with ANSI A-21.4 (latest revision) on the inside and shall be shop primed on the outside with Koppers primer #621 or equal.

b. <u>Outside Pipe and Fittings</u>

1) Ductile Iron Pipe

Ductile iron pipe shall be Class 50 (minimum) and made in accordance with American National Standards Institute (ANSI) Specification A-21.51 (AWWA C-151) latest revision. The pipe shall contain an approved cement lining in accordance with ANSI A-21.4 (latest revision).

2) <u>Ductile Iron Fittings</u>

Fittings shall be made in accordance with ANSI Specification A-21.10 (AWWA C-110) latest revision and furnished in gray iron or ductile iron as required to meet pressure requirements.

Joints: Unless otherwise noted on the Plans, all buried ductile iron pipe shall be furnished with mechanical joints as manufactured by American Cast Iron Pipe Company, U.S. Pipe and Foundry Company, or James B. Chow and Sons.

Fittings shall be furnished with Mechanical Joints. Mechanical joints shall meet requirement of ANSI Specification A-21.11 (AWWA C-111).

c. Marking

The Class designations for the various classes of pipe and fittings shall be cast into fittings in raised letters or numerals and painted on the outside of each joint of pipe. Weights shall be plainly and conspicuously painted in white on the outside of each fitting and each joint of pipe after bituminous coating has hardened.

d. Wall Sleeves or Wall Pipe

Where ductile iron piping connects with or passes through concrete walls, furnish and install cast iron wall sleeves suitable for caulking or wall pipe as shown on the Plans. Where wall sleeves are used, pipe shall run continuous through walls and a joint shall be provided within three feet (3') outside the wall. Formed openings in concrete walls for inserting ductile iron pipe will not be allowed unless specifically shown. Wall pipe shall be accurately located and securely fastened in place before concrete is poured. Wall sleeves shall be used in locations where small piping and electric wiring connects with or passes through concrete walls and shall be caulked watertight.

e. <u>Pipe Hangers, Supports and Bracing</u>

All piping systems shall be rigidly supported to prevent loosening under vibration. The Contractor shall be responsible for providing the necessary supports and bracing of piping systems to prevent damage to them during construction or normal operation. Pipe hangers shall be the adjustable split-ring type. Where shown on the Plans, special supports shall be provided.

f. Reaction Blocks

Pressure lines shall be secured by struts, bolts, or concrete reaction blocks at all bends to prevent slippage.

4. Soil Pipe

Cast iron soil pipe and fittings shall conform to Federal Specifications WW-P-4O1D, commercial extra heavy grade with bituminous coating. Joints shall be S.G.S.J. in accordance with best plumbing practice.

5. Polyvinyl Chloride (PVC) Pipe

Polyvinyl chloride (PVC) pipe, used for 2-inch and smaller, shall be manufactured from virgin NSF approved Type 1, Grade 1 or 2 Polyvinyl Chloride plastic as defined in ASTM D-1784 "Rigid Poly (Vinyl Chloride) Compounds". All pipe and fittings shall be designed for 200 psi working water pressure and meet ASTM Specification D-2241 with standard dimension ratio SDR21.

PVC pipe to be used in areas having water pressure of 135 psi or greater shall meet the requirements of AWWA C900 "Poly Vinyl Chloride (PVC) Pressure Pipe". All Class 200 pipe shall meet the requirements of DR 14.

Joints for pipe 1-1/2" and larger shall be push-on joints manufactured to meet the requirements of ASTM D-3139. Joints shall be sealed with a rubber ring gasket and non-toxic lubricant as provided by the pipe manufacturer. Gaskets shall meet all applicable requirements of ASTM F-477. The joints shall be contraction experienced with a total temperature change of at least 75 degrees in each joint.

Handling and storage of pipe shall be as recommended by the manufacturer and as approved by the Engineer. If pipe over 20 foot lengths is used, the pipe shall be supported at least every 10 feet of its length during all handling and special care shall be taken to avoid placing undue stress on the pipe. The Contractor shall submit along with the shop drawings the pipe manufacturer's printed instructions for handling and installation of the pipe.

6. <u>Installing Piping System</u>

a. Exterior

The trench shall be excavated to the required depth and width and bell holes and/or jointing holes shall be dug in advance of pipe having.

The bed for each piece of pipe shall be carefully prepared so that each individual piece of pipe shall have a uniform bearing. Pipes shall be laid in a straight line and grade without kinks or sags, and shall be laid in a workmanlike manner. Bell holes and/or jointing holes shall be large enough so that the bell or hub will clear the ground and leave ample room for making the joint and inspection.

Before each piece of pipe is lowered into the trench, it shall be thoroughly swabbed out to insure its being clean.

Each piece of pipe shall be lowered separately unless special permission is given otherwise by the Engineer.

Care shall be taken to prevent injury to the pipe coating both inside and out. No piece of pipe or fitting which is known to be defective shall be laid or placed in the lines. If any defective pipe or fittings are discovered after the pipe line is laid, they shall be removed and replaced with a satisfactory pipe or fitting without additional charge. Where a length of pipe is cut to fit in a line, it shall be so cut as to leave a smooth end at right angles to the longitudinal axis of the pipe.

All angles or bends in the pipe lines, either vertical or horizontal, shall be satisfactorily braced or anchored against the tendency of movement with joint harness or concrete anchors to the satisfaction of the Engineer or as shown on the Plans.

b. Interior

(1) General

Except as shown on the Plans, all pipe runs shall be parallel with or at right angles to walls, ceilings, equipment, etc., 45 degree fittings or angle runs shall be neatly arranged and installed, so that it both meets the service requirements and leaves the machine or equipment it is serving accessible. Insofar as possible, all valves

shall be accessible for operation by a man standing on the floor. <u>All valves more than 6-feet above floors shall be provided with operators which are accessible from the floor.</u>

(2) Pipe Drainage

All piping whose service requires draining or moisture shall be installed with the required slope in the proper direction for gravity drainage.

(3) Parallel Runs

All parallel runs of piping shall be installed with equidistant spaces between the piping and shall be neatly grouped. Grouping shall be such that crossovers, except at branches, are avoided.

(4) Hangers and Supports

Piping systems shall be supported as shown on the Plans or specified herein so as to prevent loosening under vibration and so as to prevent excessive or eccentric loads.

The maximum distance between hangers or specially detailed supports shall not exceed:

1/4" and 3/8" diameter	4 feet
1/2" diameter	6 feet
3/4" to 1" diameter	8 feet
1-1/4" to 2" diameter	10 feet
2-1/2" diameter & larger	12 feet

Piping 1-1/4" and smaller shall not be hung from rod hangers. Rod hangers, where used for pipe 1-1/2" and larger, shall not be clamped directly to masonry surfaces. Steel brackets shall be used so that there will be a space (3/4" minimum) between the pipe and any masonry. Piping 1-1/4" and smaller shall be clamped to brackets or other steel members with clamps which will allow no axial movement. Clamps and clamping arrangements shall be of the "Unistrut" type, properly supported for the required arrangement. Specially detailed supports shall be in accordance with the details shown on the Plans.

c. <u>Testing</u>

When a section of pipe is ready for testing, the line shall be thoroughly blown free with air and a leakage test made for a period of two hours at a pressure of not less than 50 psi above the working pressure. The Contractor shall furnish all labor, materials, and equipment for carrying out these tests. Joints of pipe which leak shall be repaired or replaced and retested under the same conditions and for the same period of operation

until the line passes the required test. Whenever possible, testing will be done before the trench is backfilled. All exterior ductile iron pressure pipe shall be tested as stated herein.

7. Gate Valves

a. General

Gate valves of the sizes, classes, and types required shall be furnished with flanged, mechanical joint or hub ends as shown on the Plans conforming with AWWA C500-Latest Revision as extended and modified herein. Gate valves shall be tested at double their working pressure. Gate valves shall be open by turning to the left (counter clockwise).

Buried valves 16-inches and larger shall be installed horizontal and shall be complete with bypass, roller, tracks and scrapers and bevel gears enclosed in a watertight case; valves 14-inches and smaller shall be installed in a vertical position.

If for inside service, the exterior surface of the valve, except finished flanges, shall be painted with one coat of Interol #621 primer only. Exterior or buried valves shall be coated with black asphaltum varnish.

b. Non-Rising Stein Valves (NRS)

The valves shall be iron body, bronze mounted in accordance with standard practice. As a minimum, the disc seat rings, body seal rings, stem nut, stem and wedge shall be of bronze.

The body shall be of cast iron having an unobstructed waterway with the valve open, the diameter of which shall be not less than the full nominal diameter of the pipe. The threads shall be machined in the body to receive the screwed-in bronze seal rings, and the surface under the back of the seat rings shall be machined. The body shall have end flanges dimensioned and machined to ANSI 25# Standard for 25# and 50# valves and dimensioned and machined to ANSI 25# Standard for 74# through 200# valves. Where noted as "Class 2501" valves shall be so rated and flanges shall be drilled and (raised) faced ANSI B16b-25O# accordingly.

The body flange which connects to the bonnet shall be machined and drilled.

The bonnet of the valve shall be of cast iron. The stem, collar bearing recess, the stem opening, the top of the bonnet, and the flange that bolts to the body flange shall all be machined.

The discs shall be of cast iron. Dovetail grooves shall be machined in the discs to receive the bronze seat rings which shall be rolled or peened into the grooves.

The stem shall be of bronze and shall be rolled stock with electrically upset collar. The stem shall have machined threads of the ACME Standard, two threads per inch for stems 2-inches and larger, and a modified ACME Standard, three threads per inch for smaller sizes. Step packing on valves 12-inches and smaller may be of "0" ring type unless otherwise specified.

The stem nut shall be cast of solid bronze and shall have threads machined to fit the stem.

Body seat rings shall be of cast bronze threaded and screwed into the body, after which they shall be machined on the face. The rings shall have sufficient width to withstand a bearing stress between the body and the disc ring of up to 1,000 psi at the working pressure when the valve is closed.

Disc seat rings shall be of cast bronze of such composition that can be rolled or peened into dovetailed grooves machined in the disc, after which they shall be machined on the face. They shall be wider than the body seat rings. The valves shall be equipped with an internal wedging device of the wedge or spreader type which, in closing the valve, will operate when the discs reach a position opposite the posts, to spread the disc apart and force them against the seat rings in the body. In the wedge type, the wedges shall be of solid bronze and the hooks which actuate the wedges shall be of cast iron. In the spreader type, at least one wedging surface shall be bronze faced.

The stuffing box shall be of cast iron and shall be machined on the bottom to fit the top of the bonnet and to provide the upper thrust surface for the stem collar. The stem opening through the stuffing box shall be machined to close clearance with stem to provide the lateral bearing for the stem.

The gland assembly, where used, shall be cast iron. The gland bolts shall be low carbon steel with steel nuts. The bolts connecting the body and bonnet flanges shall be commercial steel with square heads and hexagon nuts.

The gaskets between the body and bonnet and the stuffing box flanges shall be 1/32-inch thick paper equivalent to Endena.

There shall be cast on the body or bonnet of the valve the manufacturer's name, monogram or initials, pressure rating, size of the valve, and year of manufacture.

The stuffing box of all valves shall be properly backed with standard highgrade flax packing.

The valves shall be carefully inspected for any defects and shall be operated through the full travel to insure free and perfect functioning of all operating parts.

Each valve shall be subjected to a hydrostatic test; the shell to the rated test pressure and the seals to the rated working pressure.

The Contractor shall furnish a manufacturer's certificate indicating that required tests have been made and the results of all tests conform to the requirements of these specifications.

c. Rising Stem Valves (0 S & Y)

The specifications for rising stem valves are the same as the non-rising valves, except as described below. The bonnet may have the yoke cast integral for small size valves, but where the yoke is a separate piece, the bonnet shall have yoke pads cast on it and they shall be machined and drilled to fit the yoke. The stuffing box shall be cast integral with the bonnet.

The yoke may be cast integral with the bonnet or may be a separate casting with the bottom pads machined and drilled to fit the bonnet pads. The yoke shall be machined at the top to provide surface for the yoke nut and to fit the yoke.

The yoke nut shall be of bronze with a machined collar to take the thrust of operation. It shall be machined to fit the yoke cap and threaded to engage with the stem.

The stem shall be rolled bronze threaded at the bottom to fit the stem nut of the double disc valve and shall be pinned or keyed to prevent turning.

The valves shall be built with a repacking device which will allow the stuffing box to be repacked under pressure. "0" ring type packing shall not be used.

d. Resilient Wedge Gate Valves

Resilient wedge valves shall be NRS or OS & Y similar to paragraph b or c above except the discs shall be replaced by a cast iron wedge with rubber seating faces.

8. Check Valves

General

Check valves shall be of the non-slam type or the swing check type as shown on the Plans. A removable cover shall be provided for the removal of internal parts without necessitating the removal of the valve from the line. The high point of the valve shall be tapped and equipped with a plug or, where shown on the Plans, a valve or curb cock for the removal of air. Unless otherwise shown, all check valves shall be flanged with flanges dimensioned and drilled ANSI 125#.

b. Non-Slam Type

Non-slam type check valves shall be iron body, bronze mounted, with a non-corrosive shaft for attachment of a weight and lever, and a complete non-corrosive cushion chamber or "dashpot".

The cushion chamber shall be attached externally to the valve body and be constructed with a piston operating in a chamber that will effectively permit the valve to be operated without any hammering action. The cushioning shall be with liquid, and the cushion chamber shall be so arranged that the closing speed will be adjustable to meet the service requirements.

The non-slam check valves shall be Golden-Anderson Figure Number 25-D, or Ludlow-Rennsselaer List 340, or Mueller, modified to meet the liquid cushioning requirements, or equal.

c. <u>Swing Check Type</u>

Swing check type valves shall be iron body, bronze mounted with seat rings, faces and hinge pins suitable for operation in horizontal or vertical lines. Unless otherwise shown, operation shall be by means of an outside lever and adjustable weight. Swing check valves shall be as manufactured by Chapman, Mueller, M&H, American or equal.

9. Air Release Valves

Air release valves of the sizes and types shown on the Plans shall be a A.P.C.O., Crispin, Golden-Anderson, or equal, installed at the point shown on the Plans in accordance with the manufacturer's instruction.

10. Small Valves

Gate valves 2-inch and smaller unless otherwise shown shall be solid wedge, all bronze, non-rising stem, Crane 438 for screwed ends and 1320 for solder-joint or equal. Check valves shall be bronze composition disc Crane No. 34-1/2 or equal.

11. Lists of Valves and Accessories

All of the valves, operators, and other accessories are shown in the List of Valves on the Plans. The list shown on the Plans generally shows only valves larger than 2-inch and is furnished for convenience being subject to verification by use of the actual Plans.

12. <u>Yard Hydrants</u>

Yard hydrants shall be genuine "Murdock" compression type, Clow Number F-4710 or equal for 2.5 feet of bury with 1-inch inlet and threaded outlet for hose connection. All yard hydrants shall have a hose rack with fifty feet of 1-inch hose located conveniently.

SECTION 6

SAND FILTERS

1. Scope

The work to be performed under this Section consists of furnishing all materials and equipment and performing all labor for the construction of the two sand filters as shown on the Plans and as required for proper operation of the equipment.

2. Shop Drawings, Service & Tools

Shop drawings, in accordance with the requirements of Section 1 of the Detailed Specifications, shall be furnished for each and every item specified in this Section. Layouts of all piping systems shall be furnished and approved prior to fabrication.

The Contractor's responsibility for properly installing materials and equipment specified in this Section of the Specifications includes providing the services of factory representatives to supervise the installation and/or start up of any items for which such service may be required.

Shop Drawings for each individual component of the sand filters and their appurtenances shall be supplied for each device specified herein.

3. RSF Liner and Media

a. Description of PVC Materials, PVC plastic lining shall consist of widths of calendered PVC sheeting fabricated into large sections by the manufacturer by means of PVC-solution-bonded factory seams into a single piece or into the minimum number of large pieces required to fit the facility.

b. Minimum Manufacturing Specifications

(1) The PVC material shall conform to the following minimum manufacturing specifications:

<u>PROPERTY</u>	<u>SPECIFICATIONS</u>	TEST METHOD	
Thickness	30 mil		
Specific gravity	1.24 - 1.30		
Tensile strength, psi, min.	2300	ASTM D882-B	
Elongation, % min.	300	ASTM D882-B	
100% modulus, psi	1000 - 1600	ASTM D882-B	
Graves tear, Ibs.lin.,min.	300	ASTM D1004	
Water extraction, % max.	0.35	ASTM D1239	
Volatility, % max.	0.7	ASTM D1203	
Impact cold crack, F.	-20	ASTM 1790	
Dimensional Stability, % max.			
(100 C - 15 minutes)	5		
Solvent-bonded seam strength	1,		
% of tensile, min.	80		
Resistance to burial	Form	nulation shall have passed	
	USE	BR test (specially	
	form	ulated for resistance to	
		obiological attack)	
Alkali resistances		ses Corps of Engineers 0-57 2-61	
Color Cray (Std.) (Block or other colors on appoint order)			

Color - Gray (Std.) (Black or other colors on special order) Factory seals - 3/4" solution-bonded

(2) PVC polyvinyl chloride materials shall be manufactured from domestic virgin polyvinyl chloride resin and specifically compounded for use in hydraulic facilities. Reprocessed material shall not be used. It shall be dark gray in color and produced in a standard minimum width of 61 inches or greater. Thickness shall be as shown on the Plans.

c. <u>Factory Fabrication</u>

Individual widths of PVC materials shall be fabricated into large sections by PVC-solution bonding by the manufacturers into a single piece or into the minimum number of pieces as are required to fit the facility. Lap joints with a minimum joint width of 3/4-inch shall be used. After fabrication, the lining shall be accordion-folded in both directions into heavy cardboard boxes or wooden boxes for shipping purposes.

d. General

The PVC lining shall be placed over the prepared surfaces to be lined in such a manner as to assure minimum handling. It shall be sealed to all concrete structures and other openings through the lining in accordance with details shown on drawings submitted by the Contractor and approved by the engineer. The lining shall be closely fitted and sealed around inlets, outlets, and other projections through the lining. Any portion of lining damaged during installation by any cause shall be removed or repaired by using an additional piece of lining, specified hereinafter.

e. Field Joints

Lap joints of the same kind as used in the factory shall be used to seal factory fabricated pieces of PVC together in the field. Lap joints shall be formed by lapping the edges of pieces a minimum of 2 inches. The contact surfaces of the pieces shall be wiped clean to remove all dirt, dust, moisture, or other foreign materials. Sufficient vinyl-to-vinyl bonding solution shall be applied to both contact surfaces in the joint area and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

f. Repairs to PVC

Any necessary repairs to the PVC shall be patched with the lining material itself and vinyl-to-vinyl bonding solution. The bonding solution shall be applied to the contact surfaces of both the patch and lining to be repaired and the two surfaces pressed together immediately. Any wrinkles shall be smoothed out.

g. Quality of workmanship

All joints, on completion of the work, shall be tightly bonded. Any lining surface showing injury due to scuffing, penetration by foreign objects, or distress from rough subgrade shall, as directed by the Engineer, be replaced or covered and sealed with an additional layer of PVC of the proper size.

4. Sand and Other Media

a. Sand quality and specification is very important to the success of the filter. The graded sand for the filter shall conform to the following specifications:

Uniformity Coefficient Less than 3.5 Effective Size 1.0 to 3.0 mm.

The sand must be chemically non-reactive, washed and graded. The Contractor must supply the Engineer with a sample of the sand intended to be used, the name of the supplier and a laboratory sieve analysis and gradation plot verifying the sand specification. As the sand is placed on the filter or delivered to the site, samples will be taken as each 50 tons are placed or delivered. Sieve analysis will be performed on these samples and results of that analysis, gradation plot and calculated uniformity coefficient and effective size supplied to the Engineer for approval before the media layer is covered.

If sand is stored on the site before placement, care must be taken to preclude any contamination with soil materials. Such contamination can plug the filter.

Sand shall be as supplied by Newport Sand and Gravel, Newport, Tennessee or Tinker Sand and Gravel, Parsons, Tennessee or approved equal.

- b. ½-inch to 3/4-inch rounded river gravel shall be clean and washed or approved equal.
- c. Pea gravel shall be clean washed river gravel 1/4-inch to ½-inch or approved equal.

SECTION 7

EQUIPMENT AND APPURTENANCES

1. Scope

The work to be performed under this Section consists of furnishing all materials and equipment and performing all labor for the construction of the various pumps, fiberglass tanks, risers, distributions valves and filters as shown on the Plans and as required for proper operation of the equipment.

2. <u>Shop Drawings, Service & Tools</u>

Shop drawings, in accordance with the requirements of Section 1 of the Detailed Specifications, shall be furnished for each and every item specified in this Section. Layouts of all piping systems shall be furnished and approved prior to fabrication.

The Contractor's responsibility for properly installing materials and equipment specified in this Section of the Specifications includes providing the services of factory representatives to supervise the installation and/or start up of any items for which such service may be required.

Shop drawings for each element of this section shall be supplied for the review and approval of the engineer.

3. Risers and Lids (For Fiberglass Tanks Only)

a. Risers

Inlet Risers, Outlet Risers and those required over the pump assemblies for the dosing station shall be ribbed PVC as manufactured by ORENCO SYSTEMS, INC. (OSI) Risers shall extend to the ground surface and shall have a minimum nominal diameter/height as shown on the drawings.

All Risers shall be at least 12" high, and have a minimum nominal diameter of 24" when used with 12" or 15" diameter pump vaults/gravity Bio-Tube systems, or 30" when in a duplex application and shall be factory-equipped with the following:

(1) Rubber Grommets. One for each splice box and pump discharge and shall be installed as shown on the drawing.

(2) Adhesive shall be two-part epoxy, one pint per riser, for bonding riser to tank. One quart for 30-inch diameter.

b. Lids

One shall be furnished with each riser. Lids shall be OSI Model FL-21g, FL-24g, or FL30g, as appropriate, fiberglass with green non skid finish, and provided with urethane gasket, stainless steel bolts, and wrench. The riser and lid combination shall be able to support a 2500 lb. wheel load. (NOTE: This is not to imply that PVC risers are intended for traffic areas. Please refer to section on traffic protection.)

c. <u>Insulation</u> (If required)

Rigid closed-cell foam insulation of 2" or 4" thickness shall be bonded to the underside of the FRP lid. The R value shall be no less than 10 per 2" increment.

d. Installation

All systems shall be installed in accordance with the manufacturer's recommendations and the standard plans.

4. Pumping Assemblies

- a. All pumping systems shall be ORENCO SYSTEMS (OSI) High-Head Pumping Assembly or engineer approved equal, and shall be composed of:
 - (1) Risers & Lids. Same as paragraph 3 above.
 - (2) Discharge hose and valve assembly shall be OSI Model HV200BCX, 2.00" diameter, 150 psi PVC ball valve, PVC flex hose with working pressure rating of 100 psi, Schedule 40 PVC pipe, and a 12" length of PVC flex hose with fittings to be installed outside the riser.
 - (3) Mercury switch float assembly shall be OSI Model MF4A, with four mercury switch floats mounted on a PVC stem attached to the effluent screen. The floats must be adjustable without removing screened pump vault. The high/low alarm functions shall be preset as shown on the drawing. Each mercury switch float shall be secured with a nylon strain relief bushing.

- (4) High-Head effluent pump shall be OSI Model P501012-20, 3/4 Hp, 208 V, single phase, 60 Hz, 2-wire motor, with a 20 foot long extra heavy duty (SO) electrical cord with ground to motor plug. Pump shall be UL and/or CSA listed as an effluent pump. Pump shall be provided with a non-prorated five (5) year warranty. The Model 50 OSI requires a minimum liquid level of 24" be maintained within the tank at all times.
- (5) Electrical splice box shall be OSI Model SB series, UL approved for wet locations, equipped with electrical cord grips and a 3/4-inch outlet fitting. Also included shall be UL-listed butt splice connectors.
- (6) Controls and alarms shall be custom OSI Model Custom QA2 and be listed per UL 508. Panels shall be field repairable without use of soldering irons or substantial disassembly. Control panels shall meet the following at a minimum:
 - (1) Interior Door.
 - (2) Audible Alarm: Panel mount with a minimum of 80 db sound pressure at 24 inches as a warble tone.
 - (3) Visual Alarm: NEMA 4, 7/8-inch diameter, oil tight, with push-to-silence feature.
 - (4) Audio-Alarm Reset Relay: 115 V, automatic, with DIN rail mount socket base.
 - (5) Toggle Switch: 15 amp motor rated, single-pole, double-throw with three positions: Manual (MAN), (OFF) and Automatic (AUTO) (per pump).
 - (6) Circuit breaker Disconnect: Rated for 20 amps, OFF/ON switch, DIN rail mounting with thermal magnetic tripping characteristics.
 - (7) Current-Limiting Circuit Breaker: Rated for 20 amps, OFF/ON switch, DIN rail mounting with thermal magnetic tripping characteristics.
 - (8) Enclosure: NEMA 4X, fiberglass with stainless steel or non-metallic hinges, stainless steel screws and padlockable latch.
 - (9) Alarm Circuit: Wired separately from the pump circuit so that, if the pump internal overload switch or current-limiting circuit breaker is tripped, the alarm system remains functional.
 - (10) Motor Start Contactor: rated for 24 FLA, single-phase, 60 Hz.
 - (11) Elapsed Time Meter: 115VAC, 7-digit, nonresettable for each pump.
 - (12) Siemens Logo PLC Controller.
 - (13) Pump run lights (per pump).
 - (14) Lead-Lag-Alternate Control Settings.

b. Installation

All pumping systems shall be installed in accordance with the manufacturer's recommendations and the standard plan.

c. <u>Location</u>

The pump control panel shall be post mounted on the side of the recirculation tank nearest the tank and pump. NEC requires that the control panel be located within 50 feet of and within sight of the pump.

5. <u>Pump Operating Characteristics</u>

a. Filter Feed Pumps

TDH = 21.90 ft

Flow = 50 gpm

b. Return Pumps

TDH = 11.52 ft

Flow = 50 gpm

c. <u>Distribution Pumps</u>

TDH = 57.70 ft

Flow = 25 gpm

6. RSF Piping

- a. RSF Distribution laterals shall be 1.25" PVC with 1/8" orifices spaced 24" on center and factory drilled by Orenco Systems.
- b. RSF Underdrains shall be 4" PVC with slotted cuts.

7. Distribution Valves

a. General

The Contractor shall furnish and install Two OSI Model 6404 Automatic Distributing Valve Assemblies and all necessary appurtenances as specified herein and shown in the plans for a complete and operational

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system as manufactured by Orenco Systems, Inc. or approved equal. The manufacturer of the distributing valves shall furnish and warrant the equipment and accessories. The Automatic Distributing Valve Assemblies shall be pre-assembled by the manufacturer. The following items shall be included in the pre-assembled unit:

Hydrotek Distributing Valve
Section of clear pipe (for each lateral)
Ball Valve
Elbows
Unions
Couplings

b. Operation

The flow of the incoming effluent forces a rubber flap disc to seat against the valve bottom. The opening in the rubber flap disc aligns with the opening in the valve bottom to allow flow to only one valve outlet. The stem will house a stainless steel spring which pushes the rubber flap disc away from the valve bottom after the flow of effluent stops. The stem acts as a cam follower and rotates the rubber flap disc as the stem is raised and lowered through the cam.

c. <u>Construction</u>

All Fittings: SCH. 40 PVC per ASTM specification Unions: SCH. 80 PVC per ASTM Specification Ball Valve: SCH. 40 PVC per ASTM Specification SCH. 40 PVC per ASTM Specification Clear Pipe: V4XXX Distributing Valves High strength non-corrosive ABS polymer and stainless steel High Strength non-corrosive ABS V5XXX Distributing Valves polymer, stainless steel, & die cast metal Strength non-corrosive ABS V6XXX Distributing Valves polymer, stainless steel, & die cast metal

d. Submittals

Before ordering equipment, the Contractor shall submit to the Engineer for approval five (5) sets of equipment "Submittals" prior to fabrication or shipment.

8. <u>Dosing Station Structure</u>

The dosing station structure shall be a precast concrete <u>watertight</u> 1500 gallon septic tank. The tank shall have factory cut openings for the pumping units and appurtenances.

9. Ultraviolet Disinfection Equipment

The ultraviolet disinfection system shall consists of three UV modules, power/control modules, control box support frame and water level controller. Average flow for this unit is 35 gpm with a peak flow of 50 gpm.

a. UV Modules

Each UV module shall be completely assembled and contain two lamps, each installed inside a quartz sleeve and mounted in a stainless steel frame. The lamps shall be electrically wired to a single environmentally sealed plug.

The UV module and support frame material are 304 stainless steel as well as all brackets and threaded rods. The UV modules are to be designed so they can be completely submerged and can be used indoors or outdoors under all weather conditions. The UV modules are to be designed for installation in a concrete channel with dimensions as shown on the drawings. They are to set on a stainless steel frame designed for the width of the channel. The support frame is to be adjusted in height. Each module shall be capable of being removed for maintenance without system shutdown by simply switching off the related Power/Control module, disconnecting its nine wire control connector and lifting it from its support frame. No tools or special equipment is required. The quartz sleeves are to be protected by a special "Trojan 5" compound which deters coating of the sleeves. The modules are to be located so that flow is lengthways of the sleeves so that masses of algae or other debris do not get trapped inside the system.

b. Power/Control Modules

There shall be furnished one Power/Control module for each UV module described above. Each Power/Control module shall have light emitting diodes indicating the status of each individual lamp and one diode indicating if the power is on or off. Each Power/Control module is completely wired and is connected to the UV module by means of a single receptacle outlet. All metal parts are 304 stainless steel.

c. Control Box

The Power/Control modules shall be housed in NEMA 4 weatherproof control box with pedestal and wireway support. All Power/Control modules and UV modules are protected by ground fault detectors inside the control box. Lamp status indicators shall be visible through a window in the front of the control box. A main on-off switch is located on the outside of the control box. The control box shall be fabricated from mild steel and shall be coated with a paint suitable for permanent outdoor location. Electrical power supply to the box shall be 120 volt 60 Hz, single phase.

d. Level Controller

An automatic level controller shall be furnished for installation in the channel downstream from the UV modules. The level controller shall maintain the water level in the channel at the ideal height when the channel is operational. The level controller shall be made of 304 stainless steel.

The equipment shall be as manufactured by Trojan Technologies, Inc., or approved equal.

10. <u>Pressure Dripper Tubing</u>

The pressure dripper tubing shall be ½ inch NETAFIN blank and dripper bioline schedule 40 PVC or equal. Dripper emitters shall be spaced at 24 inch intervals.

SECTION 8

ELECTRICAL WORK

1. GENERAL PROVISIONS

GENERAL

WORK INCLUDED

 Provide all labor, material, tools and services for a complete installation of equipment and systems specified herein and indicated on drawings.
 Principal features of work included are:

Secondary power wiring and distribution system equipment connections.

Motor control centers.

Lighting equipment.

Electrical control systems and interlock wiring.

Electric unit heaters.

Mount telemetry equipment.

Exhaust fans.

Meter poles and underground services to elevated storage tanks. Underground services to pump stations.

RELATED WORK

- a. Foundations and pads required for equipment furnished under this division of the specifications.
- b. Field painting, except such painting as is required to maintain shop coat painting and factory finish painting.
- c. Electrical control systems and interlock wiring furnished integral or furnished with equipment.
- d. Flashing of conduits into roofing and outside walls.
- e. Plumbing equipment.
- f. Process Equipment.

QUALITY ASSURANCE

- Comply with all applicable codes and authorities.
- b. Employ only qualified journeymen for this work. Employ a competent qualified mechanic to supervise the work.
- c. Should any work be construed as being contrary to or not conforming to applicable codes, such alleged confliction to be brought to the attention of Engineer in writing (10) days prior to bid date for review so that such point in question may be resolved. All work to be installed in strict conformity with applicable codes without additional cost to Owner.
- d. Contractor to submit and/or file with proper authorities all necessary specification and drawings as required by governing authorities.

SUBMITTALS

- a. Within thirty (30) days after contract has been awarded, Contractor to submit to Engineer for approval brochures and shop drawings, as requested, of all materials, fixtures, and equipment that he proposes to use giving the names of manufacturers, trade name and specific catalog numbers.
- b. Brochures and shop drawings to be submitted in time to allow 30 days from date of receipt in Engineer's office before final approval or disapproval is required to meet construction schedule. Submittals to bear Contractor's stamp of approval evidencing he has examined and checked same and information contained therein is in accordance with contract requirements, and any deviations to be clearly marked. Approval of shop drawings not to be construed as permitting departure from the contractural documents.
- c. Above mentioned brochures to be submitted and approved before any materials are installed.
- d. In the event that within time stated above contractor fails to submit complete list of materials, equipment and accessories in proper form, the Engineer reserves the right to select a full line of materials, fixtures, and equipment, which shall be binding upon Contractor for these materials, fixtures, and equipment as the case may be and which shall be used in his work.
- e. Brochures: Submit complete descriptions, illustrations, specification data, etc. of all materials, fittings, devices, fixtures, special systems, etc., including the following.

Panelboards.

Wiring devices and plates.

Motor starters and contactors.

Disconnect switches.

Exhaust fans.

Transformers.

Light fixtures, including lamps.

Obstruction light controls.

Electric unit heaters.

- f. Proposed items to be clearly indicated when other items are shown on same sheet. When proposing items other than those specified, brochures to contain both specified item sheets and proposed item sheets for ease of comparison. On request from Engineer samples shall be submitted and/or set up, as directed, for inspection and approval. Samples will be returned to Contractor.
- g. Shop drawings: Submit specific shop drawings for the following:

Obstruction light, mounting, and control.

Motor Control Centers including schematic wiring diagrams.

Exhaust fans and installation.

OPERATING AND MAINTENANCE MANUALS

- a. Prior to final acceptance of the project, furnish to the Owner two complete bound sets of operation and maintenance manuals of instructions for operation and maintenance of all pieces of equipment and systems provided under this division of specifications, and one set to the Engineer.
- b. Manuals to also include all submittal data on all materials and equipment. Clearly indicate items provided on this project. A list giving name and address of nearest supply house carrying spare parts and name of Installation Subcontractor to be given to Owner.
- c. Verbally instruct Owner's Representatives. Contractor to obtain letter signed by the Owner's Representative indicating that the in—service training has been completed.
- d. Three sets of the following data are required: (one set in each manual)

Operating and maintenance instructions.

Spare parts lists.

Copies of approved submittal data.

e. Arrange each set of data in an orderly way, and bind each operation and maintenance manual in a separate 3—ring, hard—cover binder.

DELIVERY AND STORAGE

- a. Insofar as possible, deliver items in manufacturer's original unopened packaging. Where this is not practical, cover items with protective materials, to keep them from being damaged. Use care in loading, transporting, unloading, and storage to keep items from being damaged.
- b. Store items in a clean dry place and protect from damage.
- c. All damaged painted surfaces of equipment to be touched up to match original paint.

RECORD DRAWINGS

- a. Keep a set of blueline prints for each job location exclusively for recording deviations from the drawings which are necessary because of job conditions.
- b. Mark deviations in colored pencils so that work of various systems can be easily identified.
- c. When work is completed, record all deviations on clean sepia copies of drawings.
- d. Contractor to turn corrected sepias over to the engineer as record copies within six weeks of acceptance of the project.

PRODUCTS

MATERIALS AND EQUIPMENT

a. All materials and equipment used in carrying out these specifications to be American made unless approved otherwise by the Engineer and to be new and have UL listing, or listing by other recognized testing laboratory when such listings are available. Specifications and drawings indicate name, type, and catalog numbers of materials and equipment to be used as "standards" shall not be construed as limiting competition. Contractor may at his option, use materials and equipment properly submitted and approved by the Engineer.

EXECUTION

COORDINATION

a. Intent:

These sections of specifications and drawings form a complete set of documents for the electrical work of this project. Neither is complete without the other. Any item mentioned in one shall be as binding as though mentioned in both.

The intent of these specifications and drawings is to form a guide for a complete electrical installation. Where an item is reasonably necessary but not specifically mentioned, such as pull boxes, fittings, expansion fittings, fixture hangers, etc., for a complete system, provide same without additional cost to Owner.

Electrical layouts indicated on drawings are diagrammatical only. Exact location of outlets to be governed by architectural drawings or drawings of the specific related trades. The Engineer reserves the right to make any reasonable changes (up to 6') in location of outlets for fixtures, switches, receptacles, or equipment prior to roughing in of such without additional cost to Owner.

b. Deviations:

No deviations from specifications and drawings to be made without full knowledge and consent of Engineer.

Should Contractor find during progress of work that existing conditions make desirable a modification of the requirements of any particular item, report such item promptly to Engineer for his decision and instructions.

- c. Insofar as it is possible to determine in advance, advise masonry tradesman to leave proper chases and openings. Place all outlets, anchors, sleeves, and supports prior to pouring concrete or installation of masonry work. Should Contractor neglect doing this, any cutting and/or patching required to be done is at this Contractor's expense.
- d. Visit site and be informed of conditions under which work must be performed. No subsequent allowance will be made because of error or failure to obtain necessary information to completely estimate and perform work involved.
- e. Engineer or his representative to be mediating authority in all deviations and disputes arising on the project.
- f. Coordinate with local utility company to assure that proper points of service, transformer locations, voltage characteristics and ampacity of service are in accordance with contract drawings.

CUTTING AND PATCHING

- Repair or replace routine damage caused by cutting in performance of this contract.
- b Correct unnecessary damage caused due to installation of electrical work, brought about through carelessness or lack of coordination.
- c. Repairs to be performed with materials which match existing materials and to be installed in accordance with appropriate sections of these specifications.

TRENCHING, EXCAVATION, BACKFILLING, AND REPAIRS

- a. Provide trenching, excavation, and backfilling necessary for performance of electrical work.
- b. Trenching and excavation to be unclassified. No extra will be paid in event that rock is encountered.
- c. Backfilling to be carefully done using only clean earth thoroughly tamped and compacted below and above embedded items.

FOUNDATIONS AND PADS

General Contractor to furnish and install all foundations and pads required for equipment provided under this division of specifications. Electrical tradesman to be responsible for proper size and location of foundations, pads, anchor bolts and other items to be built into structure by Contractor.

TELEMETRY EQUIPMENT

a. Telemetry equipment will be furnished, calibrated, and adjusted under another section of the specifications. This contractor shall securely install items at the buildings and at the tanks as directed by the manufacturer, provide power, and make proper connections for station operation.

CATHODIC PROTECTION

 Cathodic protection will be furnished and installed under another section of the specifications. This Contractor shall provide power as Indicated on the drawings.

TESTS

a. On completion of work, installation to be entirely free from grounds, short circuits, and open circuits. Perform a thorough operational test in presence of Owner or his representative. Furnish all labor, materials, and instruments for above tests.

b. Prior to final observation and acceptance, test and leave in satisfactory operating condition all electrical systems and equipment.

INSPECTION OF EQUIPMENT

a. Obtain and pay for all necessary permits and inspection fees required for electrical installation.

IDENTIFICATION OF EQUIPMENT

a. Properly identify all starters, contactors, relays, safety switches and panels with permanently attached black phenolic plates with 1/4 inch white engraved lettering on the face of each, attached with two sheet metal screws. Starters and relays connected by the electrical tradesman to be identified by him whether furnished by him or others.

TEMPORARY LIGHTS AND POWER

- a. Provide a temporary electrical lighting and power distribution system of adequate size to properly serve the construction requirements, including adequate feeder sizes to prevent excessive voltage drop. Temporary work to be installed in a neat and safe manner in accordance with the National Electrical Code, Article 305, and as required by OSHA or applicable local safety codes.
- b. Provide one pigtail socket with 150-watt lamp in every building.
- c. Provide one power outlet in each building and at each elevated storage site. Power outlets to be 30-amp, single-phase, fused disconnect switches for 120/240-volt service, located as directed by the General Contractor.
- d. Check with General Contractor prior to installation to determine if any lighting or power outlets over the maximum quantity noted above are required.
- e. Provide service and panelboards required for above lighting and power outlets.
- f. Power consumption will be paid for by the Contractor.
- g. Check with the General Contractor prior to installation to determine whether single-phase or three-phase service is desired.

OBSERVATIONS

 Engineer's office will provide periodic observation of the progress of work specified herein. Purpose of the observation is to insure compliance of Contractor's work with specifications and drawings.

- b. Specifications and drawings represent work to be done in view of total project requirements. Final location of conduits, fixtures, panels, control centers, etc., to eliminate possible conflict with other trades is responsibility of Contractor. Contractor to provide all supervision required for his personnel to insure that installation is made In accordance with specifications and drawings and all safety rules and regulations are observed. In event of conflicts of work on project with other trades, Contractor to make every reasonable effort to resolve conflict through meetings and discussions with other parties involved, by preparation of drawings or other appropriate action. Only after this has been done shall the Engineer's assistance be requested.
- c. When Engineer is requested to visit project to aid in resolution of conflicts or for witnessing tests, he shall be given a minimum of 48 hours notice prior to time his presence is required at job site.
- d. If the Contractor requests the Engineer to make a trip that is unnecessary due to contractor's carelessness, bad planning, or lack of supervision, Contractor will be billed for Engineer's time for making unnecessary visit at the rate of \$400 per day plus mileage and living expenses.

ELECTRICAL SERVICES

a. The Contractor shall consult with the local electrical utility company for each location prior to submitting bid and obtain electrical services as shown. He shall assist and make any provisions necessary for complete and satisfactory services. The Contractor shall pay any charges associated with the services.

WARRANTY-GUARANTEE

- a. Engineer reserves right to accept or reject any part of installation which does not successfully meet requirements as set out in these specifications.
- b. Contractor shall and hereby does guarantee all work installed under this division shall be free from defects in workmanship and materials for a period of one year from date of final acceptance, whichever is earliest. The above parties further agree that they will repair and replace any defective material or workmanship which becomes defective within the terms of this warranty—quarantee.

2. RACEWAYS - RIGID GALVANIZED STEEL AND INTERMEDIATE METAL GENERAL

Provide a complete conduit system with associated couplings, connectors, and fittings.

PRODUCTS

Conduits to be 3/4" minimum size except that drops to wall outlets and switch legs may be 1/2".

Conduits shall be rigid galvanized steel or IMC unless otherwise indicated.

EXECUTION

Cap all conduits during construction to prevent foreign elements from entering conduit.

Concealed conduits in slabs to have a minimum of 1-1/2" concrete coverage. Run concealed conduits in as direct line as possible.

Exposed conduits shall be installed parallel to building lines.

Secure conduits to cabinets and enclosures with double locknuts and bushings.

Conduit in the ground shall have PVC coating, 40 mil thick.

Conduits on tanks to be securely fastened with welded on straps.

Complete all conduit systems before installing conductors.

3. RACEWAYS - FLEXIBLE METALLIC CONDUIT

<u>GENERAL</u>

Provide a flexible metallic conduit system for the termination points at equipment that may possibly vibrate, such as motors.

PRODUCTS

Conduit to be 1/2 inch minimum size.

In damp or wet locations, flexible conduit will be the Sealtite type.

EXECUTION

Install a copper ground wire inside of the flexible conduit to achieve continuity of ground.

Allow sufficient slack conduit to reduce the effect of vibration.

4. CONDUCTORS

GENERAL

Provide a complete system of conductors for lighting, power, fire alarm systems, and communication systems throughout the project.

PRODUCTS

All conductors to be 98 percent conductivity copper with 600-volt minimum insulation.

All conductors No. 10 and smaller to have type TW or THHN insulation.

All conductors No. 8 and larger to have type THWN or THW insulation and to be stranded.

Conductors underground beyond building lines to have cross-linked polyethylene insulation, type XHHW, if #8 or larger, and type THW for #10 or smaller.

EXECUTION

Install pull boxes in circuits or feeders over 100' long.

Make all splices or connections only at outlet or junction boxes.

5. OUTLET BOXES

GENERAL

Provide each fixture, switch receptacle, and other device with a galvanized steel outlet box of appropriate size and depth for its particular location and use.

PRODUCTS PRODUCTS

Ceiling outlet boxes to be 4" octagon and wall boxes to be 4" square with raised plaster rings or device rings.

Boxes on exposed conduits shall be standard FS or FD.

EXECUTION

Use boxes of sufficient cubic capacity to accommodate the number of conductors to be installed in accordance with the National Electrical Code.

Install boxes so that covers will be accessible at all times.

Provide extension rings on concealed boxes where needed.

6. PANELBOARDS

GENERAL

Provide all panelboards of the circuit breaker type as indicated on drawings for a complete lighting and power distribution system.

PRODUCTS

Panelboards to be of the circuit breaker type equal to Square D type NQOD or equal by ITE, Westinghouse, or Cutler Hammer.

Panelboards to be rated for <u>I20/480</u>-volt, 3-phase, 4-wire.

Loadcenters shall be equal to Cutler Hammer type CH, rainproof enclosure, lockable door, rated <u>120/480</u> volts, 1 phase, 3 wire approved for service entrance with surge arrester equal to Square D type J9200-10.

All panelboards to have isolated neutral bus.

All panels to have separate ground bus connected with a green grounding conductor back to the source of its particular feed.

All panelboards to have typed directory cards except that power panels shall have engraved phenolic nameplates attached to the individual breakers indicating the panelboard or device being served.

EXECUTION

Panelboards to be installed in motor control centers.

Loadcenters to be mounted on service poles, all conduit connections to be watertight. Provide a lock on each suitable for outdoor use, keyed alike, and furnish four keys to Owner.

7. WIRING DEVICES

GENERAL

Provide switches, receptacles, and other wiring devices as indicated on drawings.

PRODUCTS

All devices to be Bryant, Hubbell, or approved equivalent, equal to Hubbell numbers listed. Switches to be 15 amp, 120/277 volt; No. 1201.

Interior receptacles to be 15 amp, 125 volt, duplex; No. 5252.

Weatherproof receptacles to be 20 amp, 125 volt duplex, with GFI; No. GF5352 with No. RCV1-DR cover.

EXECUTION

Mount all switches 50" to center above finished floor unless noted otherwise.

Mount all receptacles up 18" unless noted otherwise.

Check Architectural drawings for special mounting conditions in special areas. Install green ground wire from panel to all receptacles.

8. DEVICE PLATES

GENERAL

Provide device plates on all wall switches, receptacles, etc.

PRODUCTS

Provide device plates of .030 satin finish stainless steel on flush boxes and industrial steel or exposed boxes.

Plates to be Bryant, Hubbell, Sierra, or approved equivalent.

EXECUTION

Install device plates in full contact with wall surfaces on concealed boxes.

Install device plates in full contact with surface-mounted boxes. Plates shall not project out from the edge of the box.

9. <u>INDIVIDUAL STARTERS AND CONTROLS</u>

GENERAL

Install and connect in complete working order all starters and controls being provided under the mechanical section of these specifications.

Furnish and install all starters listed in motor control centers and all manual starters unless integral with equipment.

PRODUCTS

See mechanical section of these specifications for starters being provided by the Mechanical Contractor. Manual starters to be 1, 2 or 3 pole, as needed, equal to Square D type 2510 with overload protection.

EXECUTION

Install starters where indicated on the drawings and connect to accomplish the purpose intended. Refer to the mechanical drawings for wiring diagrams and requirements.

10. SAFETY SWITCHES

GENERAL

Electrical Contractor to provide all disconnect switches indicated on the drawings.

PRODUCTS

Safety switches to be as manufactured by Square D, Westinghouse, ITE, or Cutler Hammer.

Safety switches to be of the heavy-duty type with arc shields and rated for the voltage of the system to which it is being used.

EXECUTION

Firmly attach each safety switch to the surface on which it is being mounted.

Safety switches Installed in moist or damp locations shall be in NEMA 3R enclosures.

11. <u>SUPPORTING DEVICES AND HANGERS</u>

GENERAL

Provide all hangers, straps, and supports needed to support electrical installations.

PRODUCTS

Supports as manufactured by Caddy, Erico, and Steel City or approved equal.

EXECUTION

Secure conduits to within 3' of each outlet box and at intervals not to exceed 5'.

Use of chains, perforated iron, baling wire, or tie wire for supporting conduit runs will not be permitted.

12. GROUNDING

GENERAL

All installations shall be grounded in conformance with the National Electrical Code, Article 250.

All current consuming devices to have a green ground wire installed in the same conduit as the phase conductors from the panel to the device. This applies to receptacles, motors, etc.

PRODUCTS

All ground wire to be copper with a green insulation or if a green insulation is not available, then green identifying tape will be installed at both termination and all accessible points. Minimum size ground wire shall not be less than required by NEC.

EXECUTION

Provide ground wires throughout distribution system and to all utilization equipment, such as receptacles, motors, and other equipment.

Provide a grounding grid at each pump station consisting of three 3/4" x 10' copperweld vertical ground rods spaced in a triangle, each 8' apart and loop connected with #2 stranded bare copper ground wire, 18" below grade. Provide an additional #2 ground wire from this grid to building steel. Each service shall be grounded to its grid and a metal water main.

All connections shall be with approved grounding terminals, fittings, or Cadweld.

13. LIGHTING

GENERAL

Provide labor and materials, equipment, and services necessary to provide all lighting fixtures and lamps.

Obstruction lights shall be in accordance with FAA requirements.

PRODUCTS

Provide lighting fixtures as indicated on lighting fixture schedule on drawings. Provide obstruction lights as noted.

Fluorescent ballasts to be high-power factor and bear ETL and CMB labels for Class "P" protection.

Fluorescent lamps to be standard <u>40-watt cool white</u>, or <u>F32T8 lamps</u>, unless noted otherwise.

Incandescent lamps to be rated at 130-volt inside frosted.

Lamps to be as manufactured by General Electric, Sylvania, Philips, or approved equivalent.

EXECUTION

Joints and fixture wiring to be made using wire nuts, preinsulated Scotch locks or other approved mechanical means of connection.

All fixtures to be firmly supported from building structure.

Outdoor bracket lights to be fastened firmly on outlet box in a weatherproof mounting. Coordinate fixture locations to clear diffusers, ductwork, piping, etc., and be readily accessible for relamping.

Securely mount obstruction lights to tank with welded straps and supports.

14. ELECTRIC SPACE HEATERS AND EXHAUST FANS

GENERAL

WORK INCLUDED

a. All work specified in this section shall comply with the provisions of Section9. Subsection 1.

b. Provide all electric space heaters and exhaust fans as shown on drawings with controls and all items needed for proper installation.

PRODUCTS

MANUFACTURERS

- a. Catalog numbers on drawings are for guidance only as to quality and performance. Heaters or fans of equal quality will be considered.
- b. Provide sheet metal box for each exhaust fan with backdraft damper, birdscreen, self-flashing roof curb, and ceiling grille.
- c. Provide controlling thermostats, equal to Honeywell #2E5 17.
- d. Provide motor-operated dampers as noted on the drawings.

EXECUTION

INSTALLATION

- a. All heaters and exhaust fans to be installed as per manufacturer's recommendations.
- All unit heaters to be wall mounted on brackets.
- c. Wiring of heaters and fans to be in conformance with the applicable sections of these specifications.

15. MOTOR CONTROL CENTERS

GENERAL

WORK INCLUDED

- a. All work specified in this section shall comply with the provisions of Section9, Subsection 1.
- b. Motor control centers shall be Class II, Type B construction with NEMA 1A (gasketed) enclosure.

- c. Power shall be supplied to motor control centers at 3-phase, 4-wire, 120/480-volt, delta connection.
- d. Motor control centers shall be equipped with a neutral landing lug for 3-phase, 4-wire requirements.
- e. Motor control centers shall be equipped with separate ground bus with lugs or connectors on bus. Bus shall be grounded to enclosure and to main ground bus in service entrance equipment with properly sized grounding conductor in same conduit as phase and neutral conductors. See grounding section of these specifications.
- f. Motor control centers shall consist of vertical sections approximately 90 inches high and not to exceed 20 inches in depth. All sections shall be joined together to form a rigid freestanding, completely dead front, NEMA 1 enclosed control assembly. Channel iron sills and lifting angles shall be provided to facilitate installation. Sections shall be fabricated of sheet steel shaped and reinforced to form a rigid freestanding structure. Sections shall have flange—formed doors with concealed hinges for each unit in front. Motor control center shall be front accessible only.
- g. Each starter or unit of control shall be provided with adequate barriers between sections. Ventilation shall be such that AEI standard requirements as to current parts will be maintained.
- h. Power shall be distributed to all sections by main horizontal bus of adequate capacity for entire lineup of units. Distribution in vertical section to be by means of vertical bus of adequate capacity for loads indicated.

SUBMITTALS

a. Shop Drawings:

Contractor to submit detailed shop drawings for approval and to obtain such approval before manufacture is commenced.

Composite schematic diagrams to be furnished. Standard wiring diagrams of starters will not be accepted as sufficient information without showing a schematic diagram of control along with wiring diagram.

Shop drawings to be specific showing bussing, breaker dimensions, starter dimensions, spare space dimensions, number, size, trip, and interrupting capacity of all circuits. Shop drawings to also show composite drawing of entire motor control center on same sheet to indicate appearance of entire unit.

Provide as-built drawings for unit after delivery of panel for distribution as required by Section 16010. Standard factory work sheets will not be acceptable as shop drawings.

PRODUCTS

ACCEPTABLE MANUFACTURERS

- a. Motor control centers to be Westinghouse, ITE, Square D, General Electric, or Cutler Hammer.
- b. Main circuit breakers to be molded case type.
- c. Main disconnect devices shall be equipped with a voltage sensing anti-single phase relay, equal to Taylor Model PNDR 480, to trip main when power is lost on any phase. Relays that trip on total loss of 3-phase power are not acceptable. Tripping power is to be made available from a Square D type ST-200 stored energy capacitor bank or equal. Each main disconnect shall also have a surge arrester, properly grounded, equal to Square D type J9200-9A.
- d. Metering: Metering shall be provided at each motor control center in unit compartment consisting of following:
 - Provide a fused voltmeter with seven position selector switch.
 - Provide an ammeter with a four position selector switch. Provide fused current transformers for ammeter.
- e. Circuit Breakers: Starter and/or feeder breakers shall be of the molded case type. Breakers shall have minimum interrupting capacity as shown on the motor control center schedule. Breakers shall have a provision to retract the line-side connections from the bus without removing the starter saddle.
- f. Starters: Starters shall be circuit breaker combination, nonreversing type starters, sizes required for the particular motors. All starters shall have 3-phase; melting alloy overloads and low-voltage protection. Reset buttons, ON and OFF push-button selector switches or HOA switches, and pilot lights where required, as shown on drawings, shall be mounted in covers. Extra relays and timers, shall be furnished in motor control center. All necessary auxiliary interlocks as required and shown on elementary diagrams shall be furnished; and in addition, one spare auxiliary interlock to be furnished with each starter.
- g. Controls: All control circuits shall have an individual 480/120-volt control transformer, unless indicated otherwise on the drawings and, shall be individually fused from load side of starter breaker using two cartridge type fuses--one for each line. Transformers shall be sized to carry holding coil circuits and any miscellaneous devices shown. All control circuits that are not fed from secondary side of starter circuit breaker shall have a disconnect type interlock.

h. Branch Panel:

Motor control centers shall have, built as an integral part, branch circuit panelboards.

Panelboard characteristics such as voltage, amps, phase, number of wires, and connection shall be as shown on schedule on drawings.

- i. Branch Panel Transformer: Branch panel transformer shall be dry type. K.V.A., primary and secondary voltages, phase, number of wires, and connection shall be as shown on drawings. Branch panel transformer shall have its primary side protected by molded case circuit breaker, size as indicated on schedule on drawings.
- j. All units shall be identified with permanent type engraved Bakelite nameplates on face of units showing motor or equipment being served. Bakelite nameplates shall be fastened with two round head screws. All terminal blocks, relays, starters, timers, etc., to be identified internally with designation as shown on drawings. See Section 9 for identification requirements.
- k. Layout as indicated on drawings has been arranged to reflect arrangement available from a particular manufacturer. If additional sections are required by other manufacturers to accommodate units scheduled and indicated, they are to furnish these additional sections provided, of course, that space is available to install additional sections.

EXECUTION

INSTALLATION

a. Each entire unit shall be sanded, cleaned, and bonderized, given a primer surface coat; then entire unit, both inside and out, shall be painted with two coats of gray enamel or quick drying lacquer. Paint shall not flake or scale within normal period of service. Surfaces damaged or scratched during erection shall be refinished and whole unit rubbed down with an approved polish.

SECTION 9

BASIS OF PAYMENT

General

The Contractor shall furnish all necessary tools, labor, machinery, apparatus, materials, equipment, service and other necessary supplies and do all work including all excavation and backfilling (without additional compensation, except where specifically set out in the Specifications) at the unit or lump sum price for the items listed in this Section.

These items refer to and are the same items listed in the PROPOSAL, and constitute all of the pay items on the project. Any other items of work listed in the Specifications or shown on the Plans shall be considered incidental and shall not be separate pay items.

The total bid price listed in the PROPOSAL for the contract and any deductive alternates which the Owner wishes to consider will be used to determine the low bid; but this does not impair the prerogative of the Owner to award to other than the low bidder.

Contract I

a. <u>Waste Water Treatment System</u>

The Contractor for Contract I, Waste Water Treatment System, shall furnish all necessary labor, machinery, tools, apparatus, materials, equipment, service, and other necessary supplies and do and perform all work including all excavation and backfilling (without additional compensation except where specifically set out in these Specifications) at the lump sum price listed in the PROPOSAL. The TOTAL BID shall be the Base Bid plus the Additive Alternate.

Space is provided in the PROPOSAL for the Contractor to list the names of the manufacturers and prices of equipment used in preparing his bid. If the contractor fails to list a manufacturer for any item of equipment listed in the PROPOSAL, the Owner reserves the right to select the manufacturer from among those listed in the PROPOSAL or Specifications.

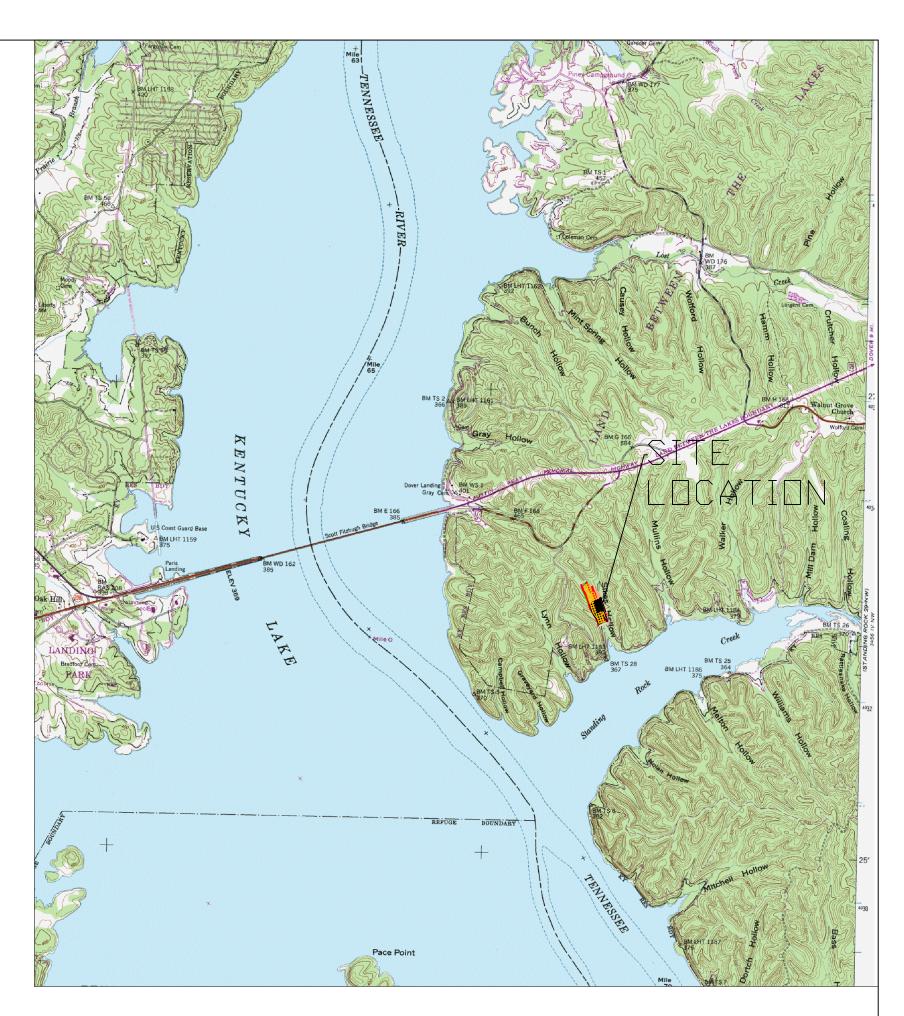
Any other alternate listed must be deductive in nature and the Owner reserves the right to award the Contract on the Base Bid, or on the adjusted bid considering any or all alternates.

Detailed Specifications D-202/01AUG13

Any alternate listed will be additive or deductive in nature as shown in the PROPOSAL. The Contractor must bid each alternate as shown. The low bid will be considered the base bid plus the one additive alternate. The Owner reserves the right to consider and award the Contract including any or all deductive alternates.

WASTE WATER TREATMENT SYSTEM FOR TO A CIE II

RIVER TRACE II STEWART COUNTY, TENNESSEE



NOTE: PROPOSED FACILITY TO BE CONSTRUCTED, OWNED AND OPERATED BY HAMMERLAND, INC.

JOB NUMBER D-202

AUGUST 01, 2013

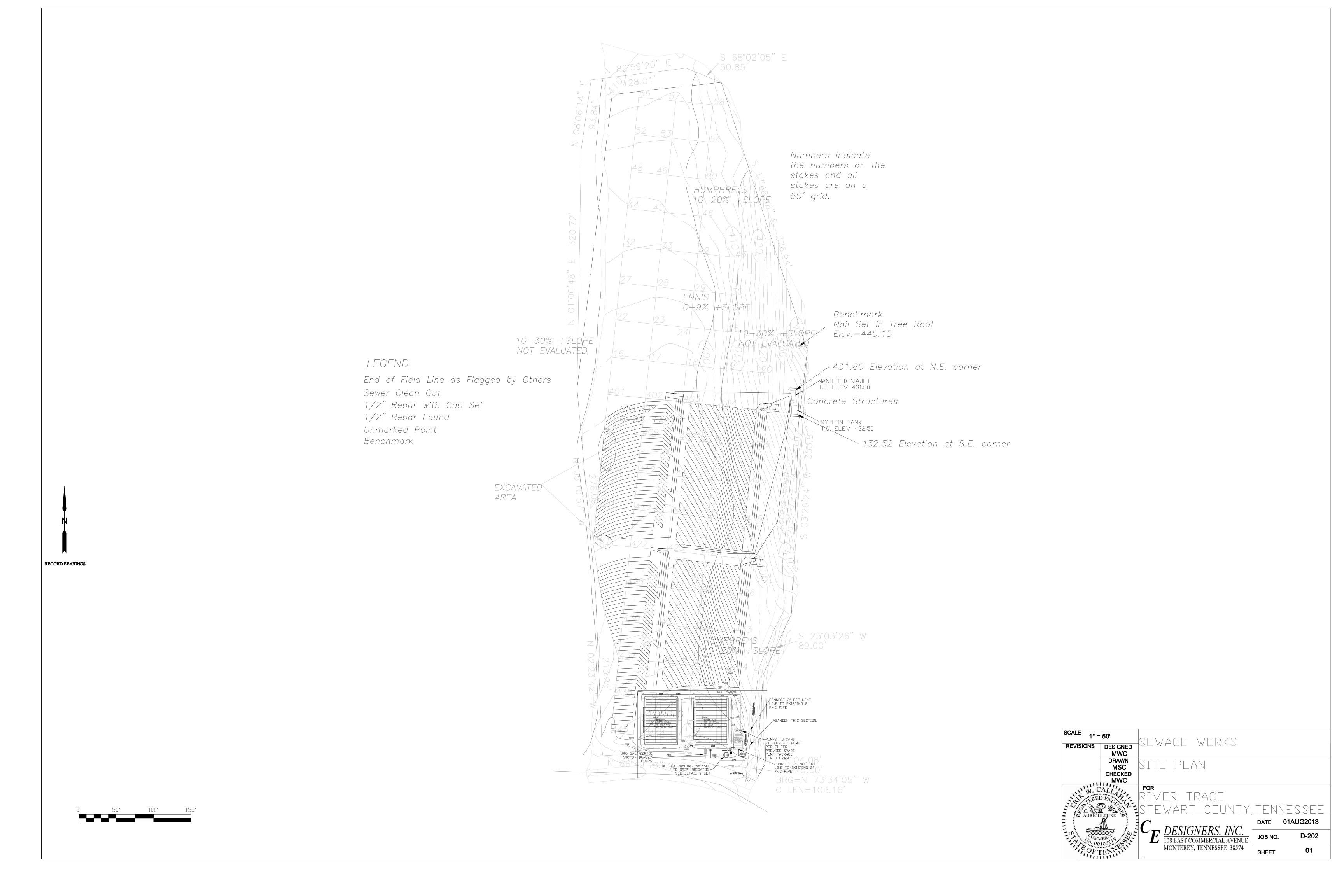


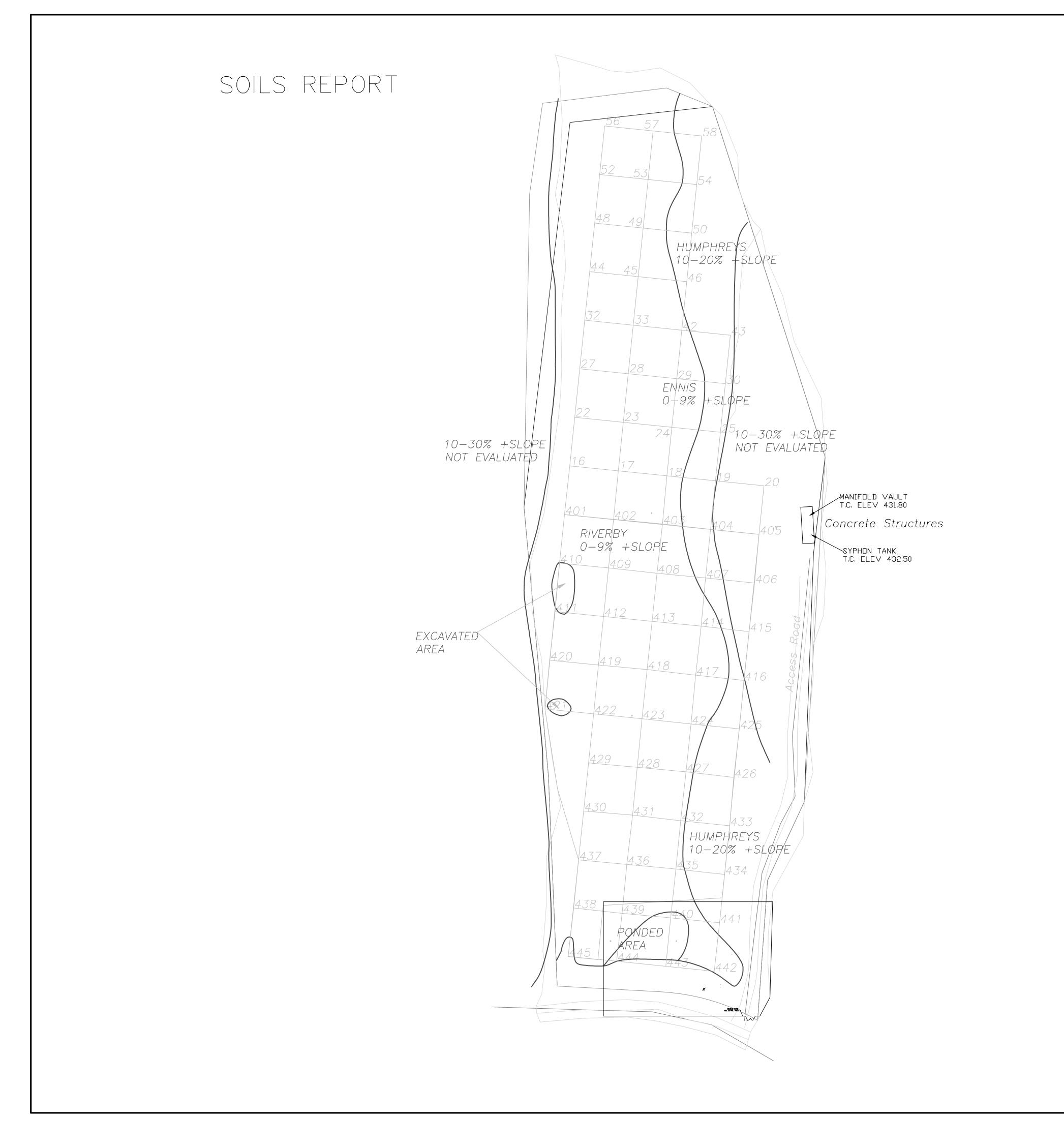


INDEX:

SHEET NO.	DESCRIPTION
	TITLE SHEET
1.	LOCATION MAP & SITE PLAN
2.	EXTRA HIGH INTENSITY SOILS MAP
3.	TREATMENT UNITS SITE PLAN & DRIP IRRIGATION PLAN
4.	PIPING PLAN & GRADING PLAN
5.	BASINS
6.	SECTION AND DETAILS
7.	SECTION AND DETAILS
8.	ELECTRICAL
9.	HYDRAULIC PLAN

SET NO.





EXTRA-HIGH INTENSITY SOIL MAP SOIL NOTES **ESTIMATED SOIL ABSORPTION RATE** > 0 to 30 inches the rate is 30 minutes per inch. Humphreys soil has properties that indicate ground water saturation at depths below 30 inches. > Below 30 inches to 48 inches the rate is greater > A soil improvement practice is not required. than 75 minutes per inch. Riverby soil is positioned in a flood plain and is subject to frequent flooding for a very brief (4 to < 48 hours) duration.</p> > The apparent seasonal high water table 24 hours after flooding was observed at depths ranging from 24 to 36 inches below the soil > 0 to 30 inches the rate is 15 minutes per inch. surface. The water table at 48+ hours was 60 to 72 inches. > Below 30 inches to 48 inches the rate is greater > Areas protected from flooding are suitable for subsurface sewage than 75 minutes per inch. > Disposal system depth is restricted due to seasonal high water > Ennis soil is positioned in a flood plain and is subject to extremely brief flooding (< 4 hours) duration. > Seasonal high water table was not observed in the upper 48 inches > 0 to 30 inches the rate is 30 minutes per inch. of the soil profile 24 hours after high rainfall. > Below 30 inches to 48 inches the rate is greater Areas protected from flooding are suitable for subsurface sewage Green than 75 minutes per inch. Disposal system depth is restricted due to the potential for seasonal high water table. PONDED AREA > Ponded area was not evaluated due to standing water. > Graded /Filled area was not evaluated. GRADED > Excavated area has a depth range of 36 to 48 inches. > These areas were not evaluated.

HIGH INTENSITY SOIL MAP COMPLETED BY:

LATENDRESSE SOIL CONSULTING

JEFF LATENDRESSE, SOIL CONSULTANT

MARCH 19, 2013

SOIL MAP LEGEND:

SOIL DELINEATION
DRAINAGE WAY -
PIT OBSERVATION +

CULVERT

CULVERT

CALCULATION OF DRIP AREA

MAXIMUM (PEAK) DAILY FLOW - 15,000 GPD
ASSUME DOSING 18 TIMES DAILY (6 TIMES / AREA)
COMMON ABSORPTION RATE OF SOIL IS 20.0 INCHES PER HOUR
15,000 GPD = 2005.22 FT ³/ DAY
EACH DOSE = 111.41 FT³ = 833.33 GAL EACH AREA IS DOSED EVERY 4 HOURS
WHICH IS 2.0 INCHES DEPTH = 1/6 FT DEPTH
735.07 FT³ X 12 IN. / FT X 1/2.0 IN. = 4410.44 FT² DOSING AREA
THE DRAINFIELD CROSS-SECTION IS 5 FT
THEREFORE THE LENGTH REQUIRED IS 882.09 FT BASED ON ABSORPTION RATE.

FROM THE NITRATE CONCENTRATIONS

MAXIMUM (PEAK) DAILY FLOW - 15,000 GPD X 1/0.208 GPD/SF = 72,115.39 SF

72,115.39 SF / 43560 SF/ACRE = 1.656 ACRE

REVISIONS DESIGNED EWC

DRAWN EWC
CHECKED MWC

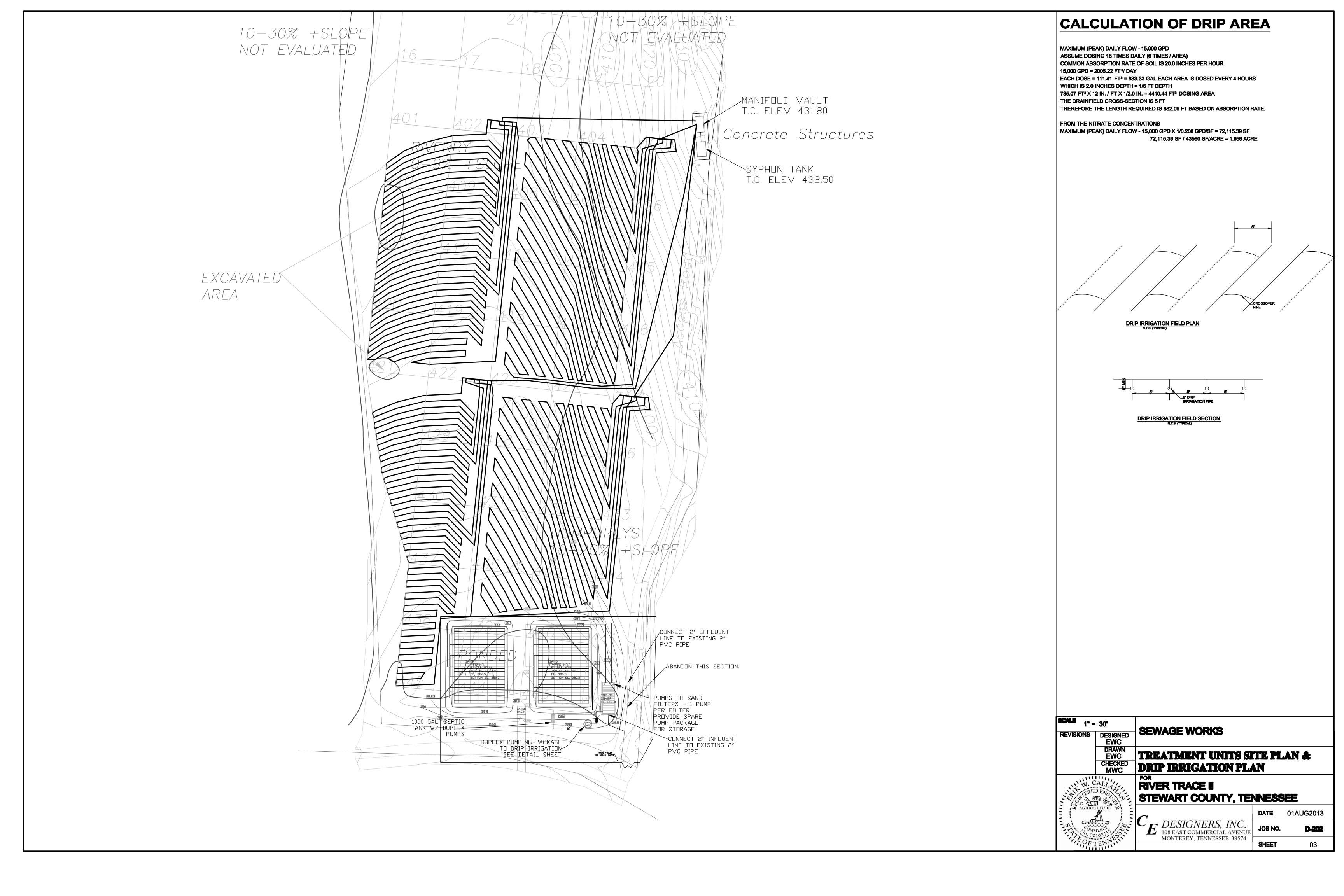
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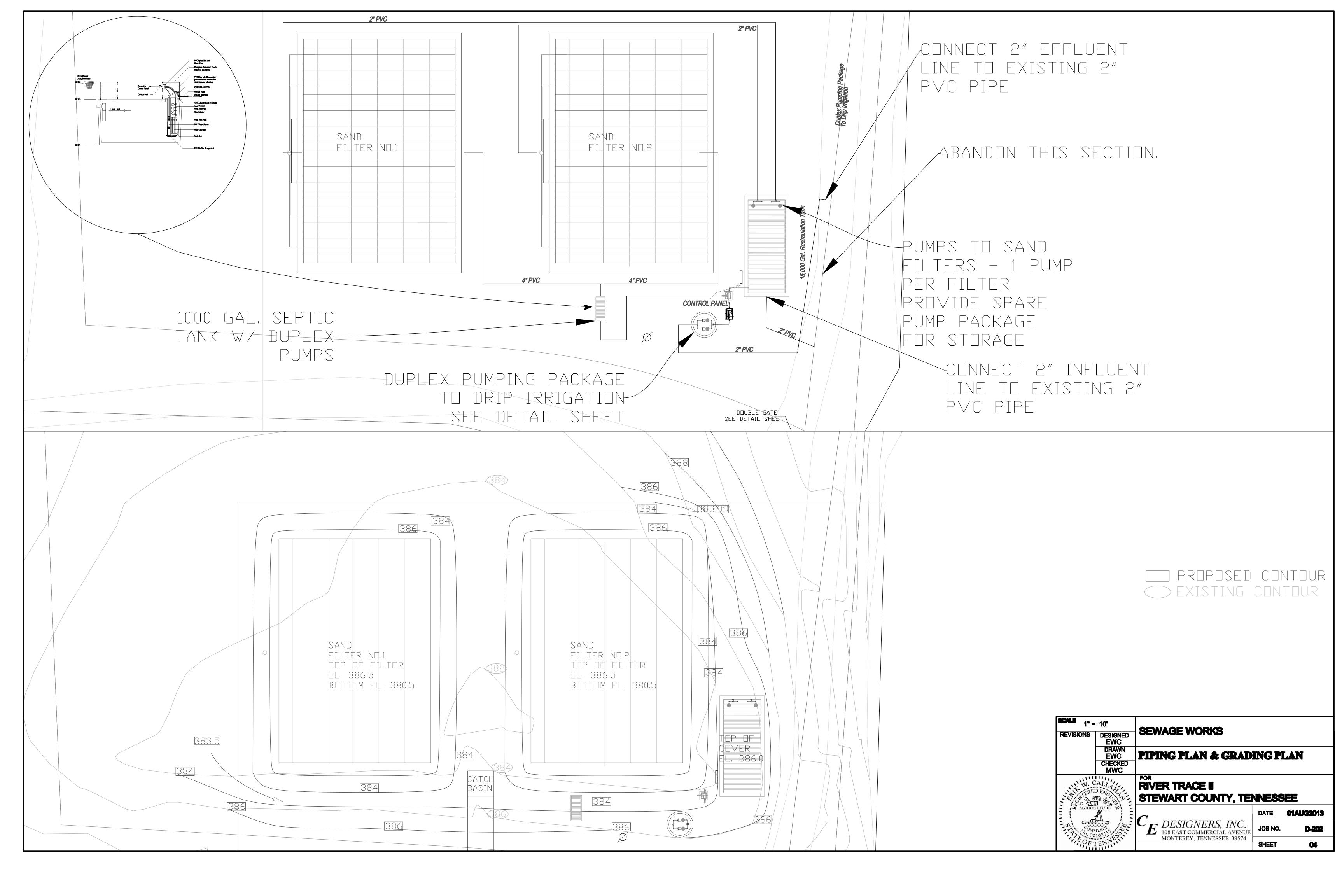


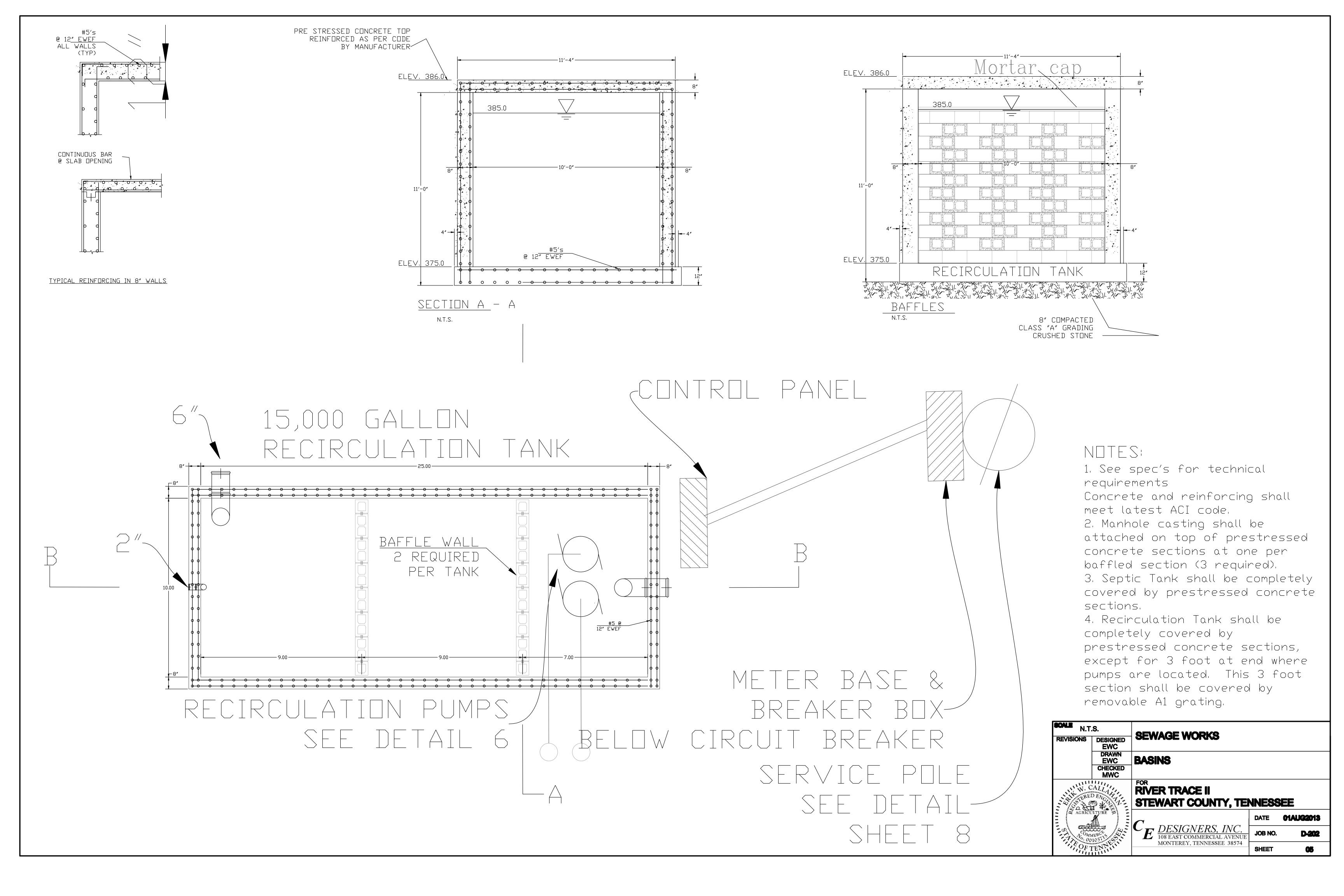
FOR RIVER TRACE II
STEWART COUNTY, TENNESSEE

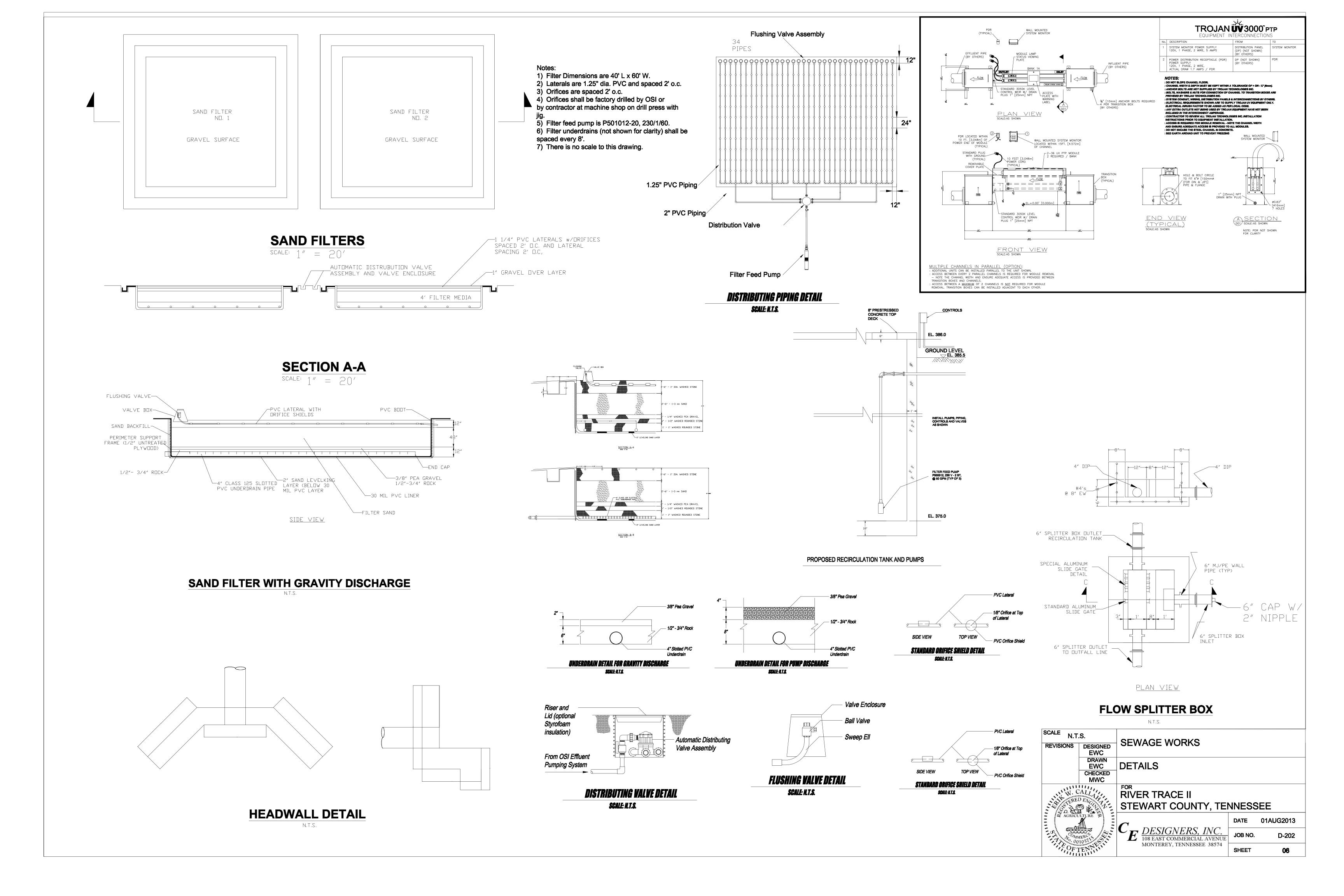
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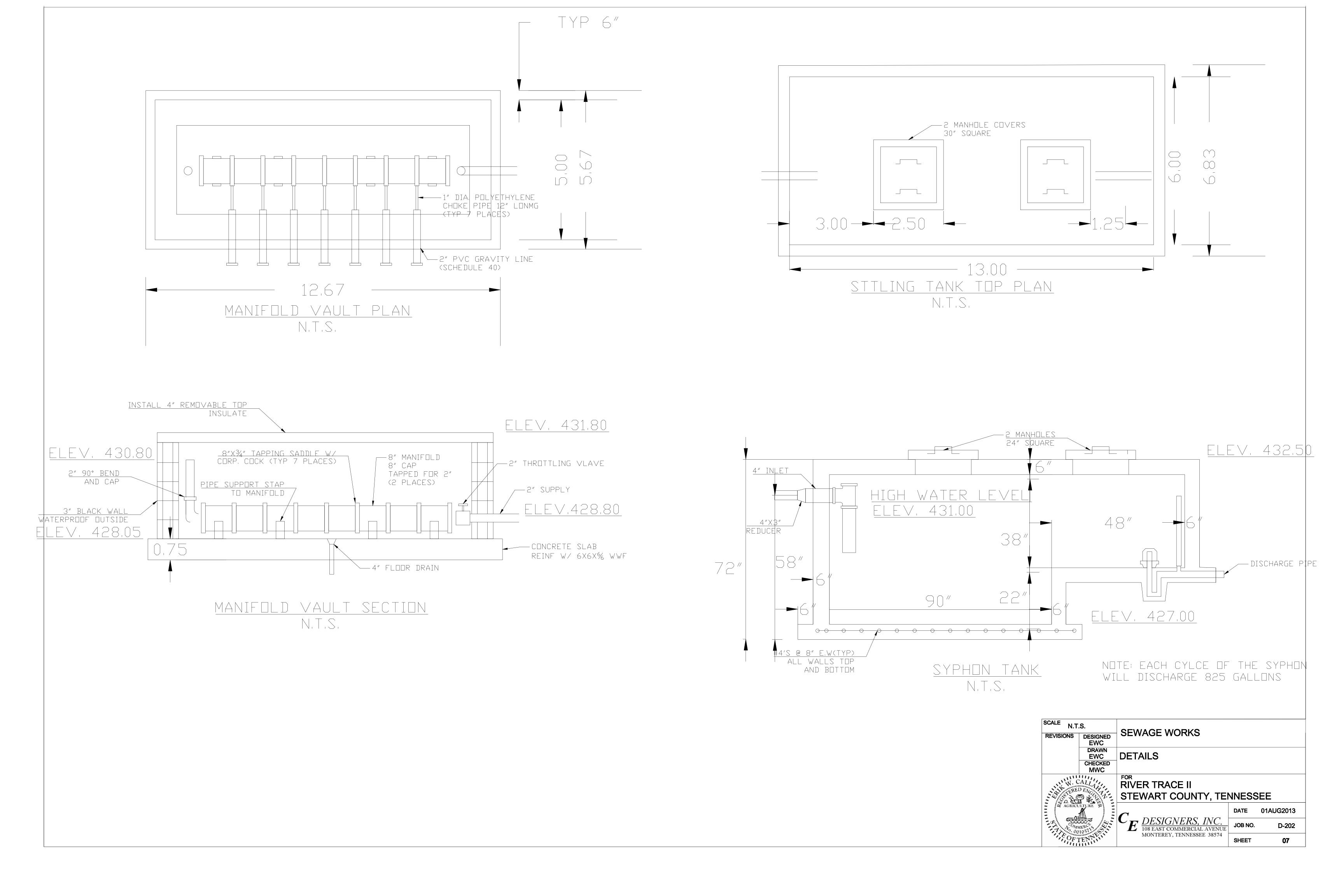
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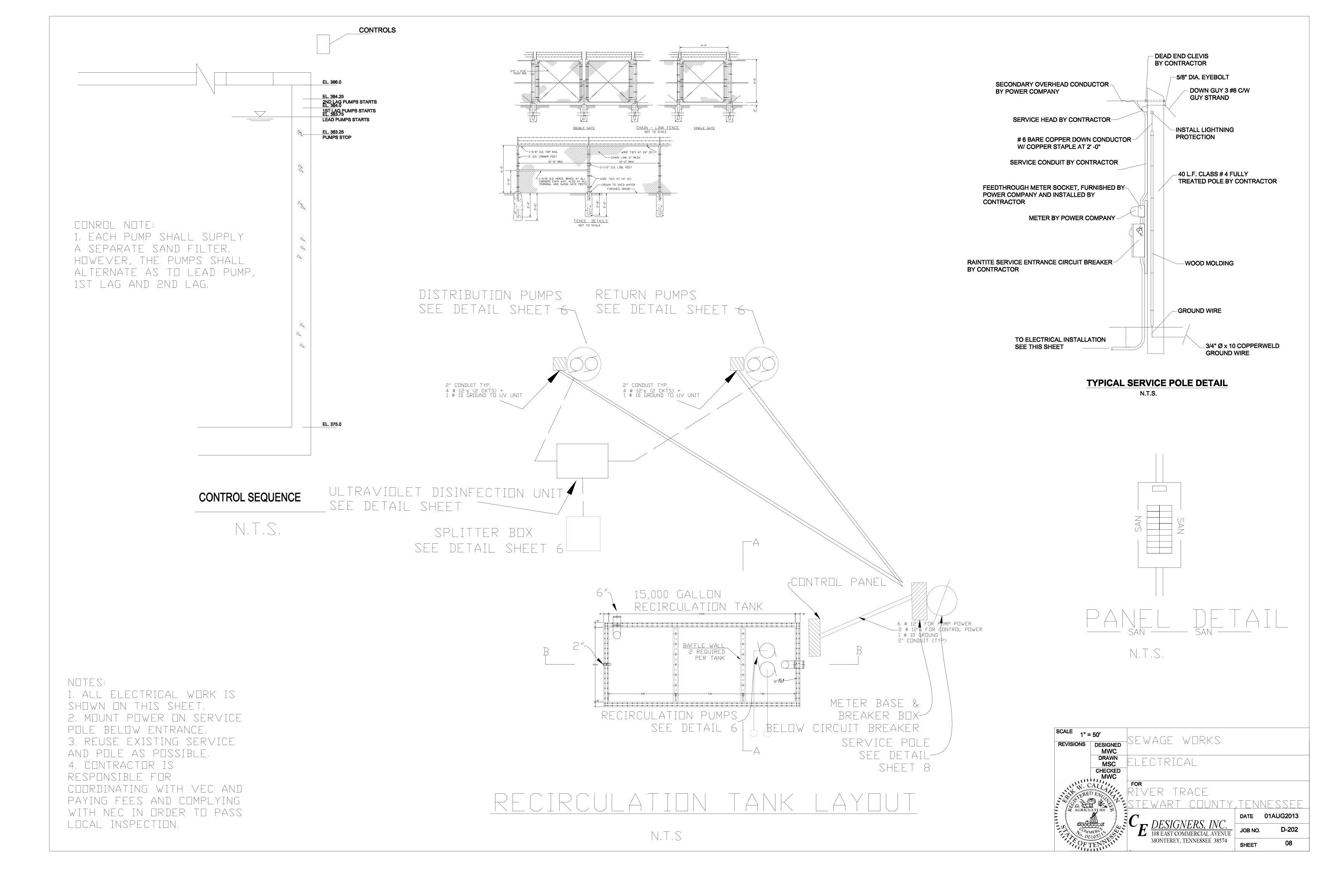


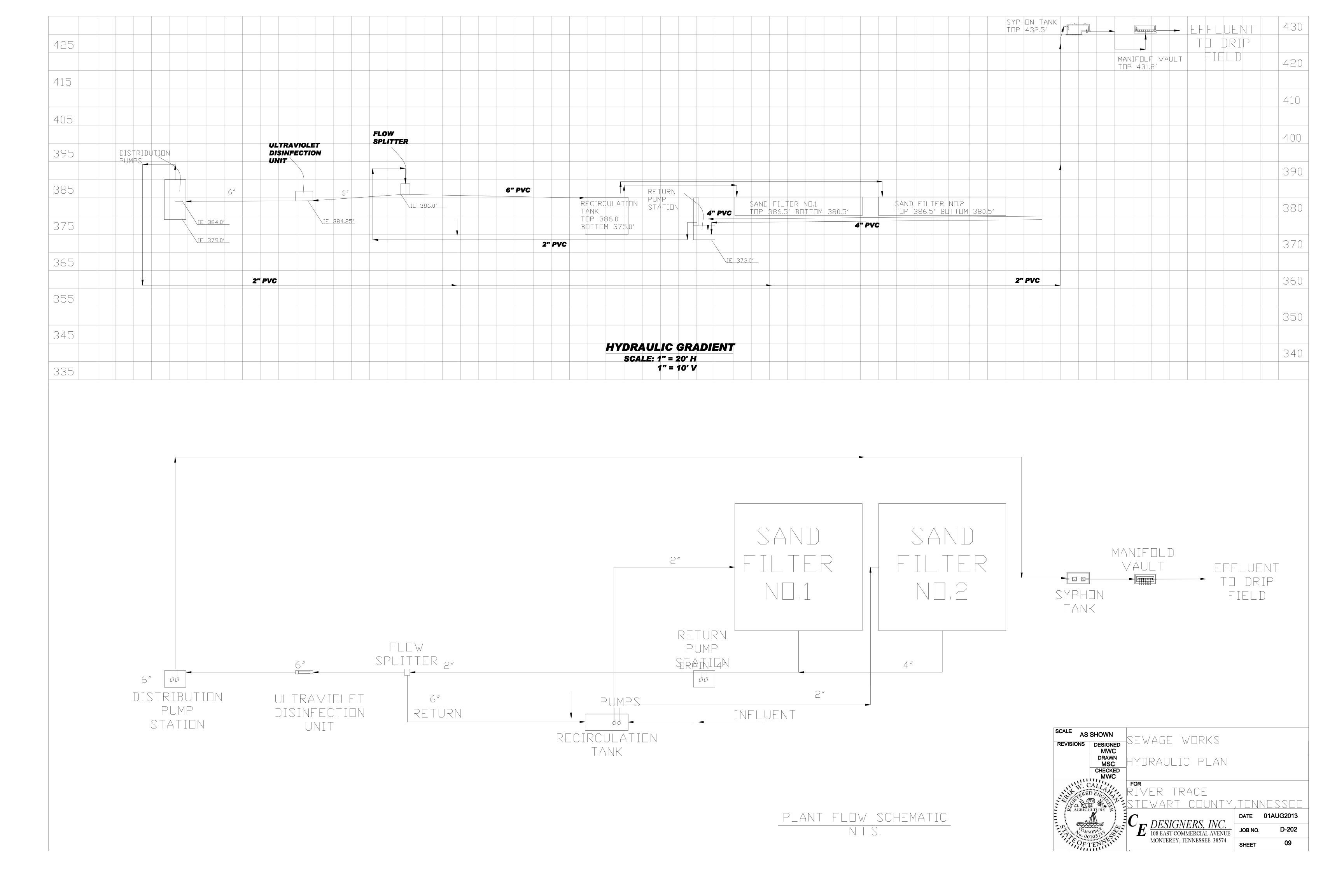












20h. Financial Statement.

ITEM	Exisitng	Initial	Initial	151	End of 1st Year	2	2nd Year		3rd Year		4th Year	88-5	5+h Vear
									5				
Users	7		7		6		11		13		15		17
Sold Lots	27		27		27		27		27		27		27
Access Fee	\$120.00/yr	\$	270.00	\$	3,240.00	↔	3,240.00	\$	3,240.00	s	3,240.00	Ş	\$ 3,240.00
Residential Service	\$50.00/mo.	\$	350.00	S	5,400.00 \$		6,600.00	÷	7,800.00	Ś	9,000.00 \$ 10,200.00	S	10,200.00
Misc. Income (est)				\$	160.00	\$	160.00	S	260.00	\$	260.00	Ş	260.00
Sales Fax (10%)		\$	62.00	S	864.00	\$	924.00	\$	1,104.00	\$	1,224.00	\$	1,344.00
Subtotal-Income				Ş	9,664.00	\$ 1	0,924.00	5	\$ 10,924.00 \$ 12,404.00	\$	13,724.00	₹	\$ 15,044.00
Expenses		\$ 1,	\$ 1,185.00	Ś	\$ 15,144.00	\$ 1.	\$ 15,144.00 \$ 15,144.00	\$		\$	15,144.00	\$	\$ 15,144.00
Loss				\$	5,400.00	Ş	\$ 4,220.00	S	\$ 2,740.00	Ş	1,420.00	Ş	100.00
Tap Fee	\$5,500.00/ea.			5)	(\$11,000.00) (\$11,000.00)	(\$1	11,000.00)	÷	(\$11,000.00)		(\$11,000.00)		(\$11,000.00)

Expenses

and

Income

Annua

Operating Loan of \$ 20,000.00 Loss Over First 5 years is \$13,880.00

20i. <u>Contact Letters</u>.

Mill Doorth

March 24, 2014

Rick Joiner, Stewart County Mayor P. O. Box 487 Dover, Tennessee 37058

Dear Mr. Joiner:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours

Pam Bygden

Secretary

PB:jc

	GET VICE TO DEMAIL TO REC MY NO INSURANCE (MON VISIT OUT WEDSITE	
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ASSA	Joiner, S Boy 487 1ev, TN	ewartco, Mayor 37058



Rick Joiner, County Mayor

P.O. Box 487

Dover, TN 37058

Phone: 931-232-3100 Fax: 931-232-3111

March 31, 2014

Pam Bygden, Secretary Hammerland, Inc 6471 E. Antioch rd. Buchanan, Tenn. 38222

Dear Mrs. Bygden,

I am in receipt of your letter of March 24 regarding improvements slated for the sewer system at River Trace II.

Please accept our letter as one supporting those efforts and to advise that Stewart County government does not have any plans to extend sewer services into that area at this time.

We appreciate the opportunity to respond to your request.

The state of the s

Rick Joiner

Stewart County Mayor

March 24, 2014

Town of Cumberland City P. O. Box 40 Cumberland City, Tennessee 37050

Gentlemen:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours,

Pam Bygden Secretary

PB:jc

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TOWN OF CUMBERLAND CITY

121 MAIN STREET PO BOX 40

CUMBERLAND CITY, TENNESSEE 37050 (931)-827-2000 PHONE (931)-827-2395 FAX

Gary Vaughn, Mayor

Cheryl Milliken, Recorder

April 25, 2014

Pam Bygden, Secretary Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222

Ms. Bygden,

I am in receipt of your letter of March 24 regarding improvements slated for the sewer system at River Trace II.

Please accept our letter as one supporting those efforts and to advise that the Town of Cumberland City does not have any plans to extend sewer services into that area.

We appreciate the opportunity to respond to your request.

Sincerely,

Gary Vaughn

Mayor

[&]quot;This institution is an equal opportunity provider and employer."

March 24, 2014

Town of Dover P. O. Box 447 Dover, Tennessee 37058

Gentlemen:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

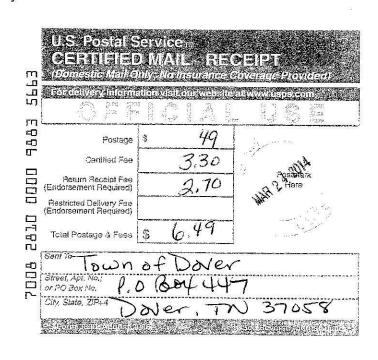
If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours,

Pam Bygden

Secretary

PB:jc





P.O. Box 447 Dover, Tennessee 37058

Phone 931-232-5907 Fax 931-232-9528

April 30, 2014

Hammerland Inc.

6471 E. Antioch Road

Buchanan, TN. 38222

To Whom It May Concern:

1 Wall

The Town of Dover has no conflicts with your new treatment works due to the fact River Trace is not in our area. If you have any questions, please contact me.

Respectfully,

Kim Wallace

City Administrator

March 24, 2014

North Stewart Utility District 2361 Highway 79 Dover, Tennessee 37058

Gentlemen:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours,

Pam Bygden Secretary

PB:jc



North Stewart Utility District 2361 Highway 79 Dover, TN 37058 931-232-5525 931-232-7757(Fax)

March 31, 2014

Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222

Dear Pam:

North Stewart Utility District received your letter concerning upgrading your sewage service for the River Trace area. This will not have any conflict with the North Stewart Utility District. We have no plans of sewer service in this area.

If you have any questions or concerns please contact me.

Sincerely,

Office Manager

"This institution is an equal opportunity provider, and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D. C. 20250-9410, or call (800) 795-3272 (voice) or (202) 720-6382 (TDD)."

March 24, 2014

West Stewart Utility District %Jim Butkiewiez 107 Raccoon Circle Dover, Tennessee 37058

Dear Mr. Butkiewiez:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours,

Anula Holder
Pam Bygden

Secretary

PB:jc

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May 5, 2014

Pamela Bygden Hammerland, Inc. 6471 E. Antioch Road Buchanan, TN 38222

RE: River Trace Sewer Treatment Upgrade

Dear Mrs. Bygden:

The West Stewart Utility District Board met on Thursday, May 1st and they asked that we respond to the registered letter you sent on March 24th, 2014 regarding the planned upgrade of the River Trace community sewage collection and treatment system.

The West Stewart Utility District currently has no interest in providing sewer to this community. However, the Utility District does have exclusive rights to provide water for the River Trace community. What are your plans to provide water to this community?

If you have any questions or concerns, please contact Michael Wheeler with Rye Engineering at (931) 289-2300.

Sincerely,

Rye Engineering PLC

Michael Wheeler MPM

March 24, 2014

Pickney Bros., Inc. 7638 River Road Pike Nashville, Tennessee 37209-5733

Gentlemen:

Hammerland, Inc. has provided a community sewage collection and treatment service for the area near River Trace II since 1994. We are in the process of upgrading our facilities to provide continued sewer service on into the future.

This letter is to inform you of our work which includes new treatment works and to seek your comments as to whether this conflicts with any of your future plans.

If you have any questions, you may contact me at (731) 642-1399.

Sincerely yours,

Pam Bygden Secretary

PB:jc

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CENTRAL CONTRACTOR	inc	See Revelse for Institutions

NOTICE

No written response from Pickney Bros., Inc. was received. This company has no facilities within 12 miles of our existing sewage treatment works.

Thank you for us a Return Receipt Service.	
I also wish to receive the following services (for an extra fee): 1.	COMPLETE THIS SECTION ON DELIVERY A. Signature B. Received by (Printed Name) C. Date of Delivery C. Date of Delivery ARR 26 2. MAR 26 2. MAR 26 2. Bervice Type C. Certified Mail C. Date of Delivery ARR 26 2. MAR 26 2. Bervice Type C. Date of Delivery ARR 26 2. MAR 26 2. Bervice Type C. Date of Delivery C
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102595-02-M-1540

Domestic Return Receipt

PS Form 3811, February 2004

2. Article Number (Transfer from service label) 100% 28 10 000 PS Form 3811, February 2004 Domestic Return Receipt		SENDER: COMPLETE THIS SECTION Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired. Item 4 if Restricted Delivery is desired. Item 4 if Restricted Delivery is desired. Print your name and address on the reverse so that we can return the card to you. So that we can return the back of the malipiece, or on the front if space permits. 1. Article Addressed to: 2. Article Addressed to: 3. Also complete the reverse to the reverse to your serverse to	2. Article Member. (Trans) of them espires area) (00) PS IV TIMBO 11 Jenus 100	Jover, TN 37058	1. Article Addressed to: 10 who of Dover 100 1604 447	 Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailplece, or on the front if space permits. 	SENDER: COMPLETE THIS SECTION
0 780	0 2 4 - 61	A. Signature A. Signature B. Received by (Printed Name) D. Is delivery address different from item 1? D. Is delivery address below:	102595-02-M-1540	3. Service Type Certified Mail	If YES, enter delivery address below: □No MAR 26 2		COMPLETE THIS SECTION ON DELIVERY

20j. Pre-Filed Direct Testimony

BEFORE THE TENNESSEE REGULATORY AUTHORITY NASHVILLE, TENNESSEE

March 24, 2014

Docket No	
	W 10

IN RE:

PETITION OF HAMMERLAND UTILITIES, INC, TO OBTAIN A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY FOR SEWER SERVICE TO A PART OF STEWART COUNTY, TENNESSEE KNOWN AS RIVER TRACE II

PRE-FILED DIRECT TESTIMONY OF PAM BYGDEN

- Q. State your name for the record and your position with the Petitioner, Hammerland Utilities, Inc.
- A. Pam Bygden. I am secretary of Hammerland Utilities, Inc.
- Q. What is the business of Hammerland Utilities, Inc.?
- A. To develop and manage resort residential developments and to provide economic sewer service to those developments where sewer service is not otherwise available.
- Q. Is there a need for waste water service in the proposed development?
- A. Yes. Hemmerland Utilities, Inc. has been operating a sewage collection and treatment system to serve River Trace II since 1994. Plans for this system were approved by TDEC and a permit was issued. In 2013, TDEC Groundwater Division decided that this system was no longer adequate. At a meeting, TDEC offered two options. The first option was to continue to use the existing system but restrict it to only 18 homes. This is not satisfactory because 7 users are connected to the system; 27 other lots have been sold with the promise of sewer service being available; a condo site has been sold which has a capacity of 8 units; and 10 more lots are available. This is a total of 52 potential customers. The second option was

to construct a decentralized sewage treatment system which would serve all 52 potential customers. A copy of this order giving these two options included in the docket. I have contacted other utilities and governments in the area and they have no plans to service this area. Additionally, most of the soils in this development are not suitable for septic systems.

Q. What services will Hammerland Utilities, Inc. provide to the River Trace II community?

A. Hammerland Utilities, Inc. will provide waste water service: Including pumping and maintenance of the step systems at individual homes. Maintaining the community main lines. Maintaining and operating the treatment plant and drip field. All operation and maintenance will be done in a manor as to meet all requirements of the state operating permit.

Q. Does Hammerland Utilities, Inc. have the technical, managerial, and financial capability to provide waste water service to River Trace II?

A. Yes. Hammerland Utilities, Inc. staff and associates have all the necessary technical, managerial, and financial capability to provide waste water service to River Trace II and the nearby area. I am currently Secretary of Hammerland Utilities, Inc. I have been involved in the management of small businesses since 1984 in both Florida and Tennessee. I shall be responsible for all administrative and financial operations of the proposed sewer system. Randy Stamps has a 30 year history of solving technical and maintenance problems in different industries. He shall be responsible for Outside Operations and Maintenance which includes supervision of new service installation, maintenance and sewage plant operation, all of which will be provided on a contract basis. Terry Wimberley is presently Director of Water and Waste Water Operations for the Paris Board of Public Utilities. He has agreed to provide operator services on a contract basis for the proposed sewer plant. C E DESIGNERS, INC. has designed our sewage facilities and will supervise the construction of the proposed sewage treatment plant.

Q. Will Hammerland Utilities, Inc. abide by all applicable tennessee statues and TRA rules governing waste water utilities?

A. Yes, Hammerland Utilities, Inc. will abide by all applicable Tennessee statues and TRA rules governing waste water utilities. Including but not limited to TRA Rule Chapters 1220-1-1, 1220-4-1 and 1220-4-13.

Q. How many customers will be served in this development?

 Hammerland Utilities, Inc. will service 52 residential waste water customers once the potential residential service area is built out.

Q.	Identify any complaints filed with any state regulatory agency involving Hammerland, Inc.
A.	A citizen complaint to TDEC about overflowing sewage caused a response from the state. Approval of this petition and the construction of the proposed sewage treatment plant will resolve this complaint.
Q.	Does this conclude your pre-filed testimony?
A.	Yes.
Pam I	ar that the foregoing testimony is true and correct to the best of my knowledge and by the bes
Notar	pribed and sworn to me this 24th day of March, 2014 by Public Lances L Log ty of Henry commission Expires 1/24/15 CERTIFICATE OF SERVICE
The u	ndersigned hereby certifies that the above and foregoing Pre-filed Direct Testimony
of Par	n Bygden has been served upon the Tennessee Regulatory Authority, 460 James
	tson Parkway, Nashville, Tennessee 37243. By the method of hand delivered.
On thi	s day of

CONTRACT

THIS AGREEMENT made and entered into this the	day of	, 2014,
by and between <u>CAT Construction / AUI, LLC</u>	hereinafter called the 0	Contractor,
and Hammerland Utilities, Inc., hereinafter called the Own	ner, for the work located a	at River
Trace II, Stewart County, Tennessee.		
WITNESSETH:		

That the Contractor, for the consideration hereinafter fully set out, hereby agrees with the Owner as follows:

Scope of the Work

That the Contractor shall furnish all labor, materials, tools, machinery, and service, to complete the construction of a Waste Water Treatment System for River Trace II in Stewart County, Tennessee, for the Owner, in the manner and form as provided by the Plans, Specifications and Documents attached hereto:

All identified as a Waste Water Treatment System for River Trace II in Stewart County, Tennessee, CED Job Number D-202, August 1, 2013, as prepared by **C E DESIGNERS, INC.**, Monterey, Tennessee, and shall do everything required by this Agreement, Advertisement for Bids, General Conditions, Detailed Specifications, Proposal, Payment Bond, Performance Bond and Addenda.

2. <u>Time for Commencement and Completion</u>

The Contractor shall commence the work to be performed under this Agreement on written order of the Engineer, and shall fully complete all work hereunder within the following number of consecutive calendar days from and including said date.

Contract I - One hundred fifty (150) calendar days for completion of all work.

3. <u>Payments</u>

The Owner hereby agrees to pay to the Contractor for the faithful performance of this Agreement, subject to additions and deductions as provided in the Specifications and Contract Documents, in lawful money of the United States, as follows:

the full sum of <u>Two Hundred Ninety-Seven Thousand Five Hundred Dollars</u>
and No/100

(\$297,500.00)

4. Final Estimates

Upon submission by the Contractor of evidence satisfactory to the Owner that all payrolls, material bills, and other cost incurred by the Contractor in connection with the construction of the work have been paid in full, final payment on account of this Agreement shall be made within (60) days after the completion by the Contractor of all work covered by this Agreement, and the acceptance of such work by the Owner.

5. <u>Liquidated Damages</u>

It is mutually agreed between the parties hereto that time is the essence of this Contract, and in the event the construction of the work is not completed within the time herein specified, it is agreed that from the compensation otherwise to be paid to the Contractor, the Owner may retain the sum of One Hundred (\$100.00) Dollars per day for Contract I for each day thereafter, Sundays and Holidays included, that the work remains uncompleted, which sum shall represent the actual damages which the Owner will have sustained per day by failure of the Contractor to complete the work within the time stipulated, and this sum is not a penalty, being the stipulated damage the Owner will have sustained in event of such default by the Contractor.

6. Additional Bond

It is further mutually agreed between the parties hereto that, at any time after the execution of this Agreement and the Surety Bond hereto attached for its faithful performance, the Owner shall deem the surety or sureties upon such bond to be unsatisfactory, or if for any reason such bond ceases to be adequate to cover the performance of the work, the Contractor shall, at his expense, within five days after the receipt of notice from the Owner so to do, furnish an additional bond or bonds in such form and amount, and with such surety or sureties as shall be satisfactory to the Owner. In such event, no further payment to the Contractor shall be deemed to be due under this Agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Owner.

CONTRACT D-202/01AUG14

IN WITNESS WHEREOF the parties hereto have executed this Agreement on the day and date first above written in six (6) counterparts, each of which shall, without proof or accounting for the other counterparts, be deemed an original Contract.

	Contractor: CAT Construction / AUI, LLC By: Jeffery Callahan
WITNESSES:	Title: President
Aly fruly	
	HAMMERLAND UTILITIES, INC.
	By: Janula Hyden
	Title: Secretary
WITNESSES:	
Black	
Danny Ham	