Administrative Package Cover Page

This file contains the following documents:

1. Summary of application (in plain language)
   - English
   - Alternative Language (Spanish)
2. First Notice (NORI-Notice of Receipt of Application and Intent to Obtain a Permit)
   - English
   - Alternative Language (Spanish)
3. Application materials

Portada de Paquete Administrativo

Este archivo contiene los siguientes documentos:

1. Resumen de la solicitud (en lenguaje sencillo)
   - Inglés
   - Idioma alternativo (español)
2. Primer aviso (NORI- Aviso de Recepción de Solicitud e Intención de Obtener un Permiso)
   - Inglés
   - Idioma alternativo (español)
3. Materiales de la solicitud

Undine Texas Environmental, LLC. (CN604519330) operates the Bayridge wastewater treatment plant (RN 102342268), an activated sludge process plant operated in the complete mix mode. Located approximately 1.5 miles southeast of the intersection of Farm-to-Market Road 1405 and Farm-to-Market Road 2354, on the south side of Farm-to-Market Road 2354, in Chambers County, Texas 77523

This application is for a renewal to discharge at an annual average flow of 100,000 gallons per day of treated domestic wastewater via Outfall 001.

Discharges from the facility are expected to contain five-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), ammonia nitrogen (NH_3-N), and *Escherichia coli*. Additional potential pollutants are included in the Domestic Technical Report 1.0, Section 7. Pollutant Analysis of Treated Effluent and Domestic Worksheet 4.0 in the permit application package. Domestic wastewater is treated by an activated sludge process plant and the treatment units include a bar screen, aeration basins, final clarifiers, sludge digesters and chlorine contact chambers

Undine Texas Environmental, LLC. (CN604519330) opera la planta de tratamiento de aguas residuales de Bayridge (RN 102342268), una planta de proceso de lodos activados operada en modo de mezcla completa. aproximadamente 1,5 millas al sureste de la intersección de Farm-to-Market Road 1405 y Farm-to-Market Road 2354, en el lado sur de Farm-to-Market Road 2354, en el condado de Chambers, Texas 77523

Esta solicitud es para una renovación para descargar a un flujo promedio anual de 100,000 galones por día de aguas residuales domésticas tratadas a través del Emisario 001.

Se espera que las descargas de la instalación contengan demanda bioquímica de oxígeno carbonoso ($CBOD_5$), sólidos suspendidos totales (TSS), nitrógeno amoniacal (NH_3-N) y *Escherichia coli durante cinco días* . Se incluyen contaminantes potenciales adicionales en el Informe Técnico Nacional 1.0, Sección 7. Análisis de Contaminantes del Efluente Tratado y Hoja de Trabajo Doméstico 4.0 en el paquete de solicitud de permiso. Las aguas residuales domésticas son tratadas mediante una planta de proceso de lodos activados y las unidades de tratamiento incluyen criba de barras, balsas de aireación, clarificadores finales, digestores de lodos y cámaras de contacto de cloro.

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This application is for a renewal to discharge at an annual average flow of 100,000 gallons per day of treated domestic wastewater via Outfall 001.

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Esta solicitud es para una renovación para descargar a un flujo promedio anual de 100,000 galones por día de aguas residuales domésticas tratadas a través del Emisario 001.

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

NOTICE OF RECEIPT OF APPLICATION AND INTENT TO OBTAIN WATER QUALITY PERMIT RENEWAL

PERMIT NO. WQ0013643001

APPLICATION. Undine Texas Environmental, LLC, 17681 Telge Road, Cypress, Texas 77429, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0013643001 (EPA I.D. No. TX0042081) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 100,000 gallons per day. The domestic wastewater treatment facility is located approximately 1.5 miles southeast of the intersection of Farm-to-Market Road 1405 and Farm-to-Market Road 2354, on the south side of Farm-to-Market Road 2354, in Chambers County, Texas 77523. The discharge route is from the plant site to directly to Upper Galveston Bay. TCEQ received this application on October 11, 2023. The permit application will be available for viewing and copying at Sterling Municipal Library, 1 Mary Elizabeth Wilbanks Avenue, Baytown, in Chambers County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.896944,29.661944&level=18

The application is subject to the goals and policies of the Texas Coastal Management Program and must be consistent with the applicable Coastal Management Program goals and policies.

ALTERNATIVE LANGUAGE NOTICE. Alternative language notice in Spanish is available at: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. El aviso de idioma alternativo en español está disponible en https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications.

ADDITIONAL NOTICE. TCEQ's Executive Director has determined the application is administratively complete and will conduct a technical review of the application. After technical review of the application is complete, the Executive Director may prepare a draft permit and will issue a preliminary decision on the application. **Notice of the Application and Preliminary Decision will be published and mailed to those who are on the county-wide mailing list and to those who are on the mailing list for this application. That notice will contain the deadline for submitting public comments.**

PUBLIC COMMENT / PUBLIC MEETING. You may submit public comments or request a public meeting on this application. The purpose of a public meeting is to provide the

opportunity to submit comments or to ask questions about the application. TCEQ will hold a public meeting if the Executive Director determines that there is a significant degree of public interest in the application or if requested by a local legislator. A public meeting is not a contested case hearing.

OPPORTUNITY FOR A CONTESTED CASE HEARING. After the deadline for submitting public comments, the Executive Director will consider all timely comments and prepare a response to all relevant and material, or significant public comments. **Unless the application is directly referred for a contested case hearing, the response to comments, and the Executive Director's decision on the application, will be mailed to everyone who submitted public comments and to those persons who are on the mailing list for this application. If comments are received, the mailing will also provide instructions for requesting reconsideration of the Executive Director's decision and for requesting a contested case hearing.** A contested case hearing is a legal proceeding similar to a civil trial in state district court.

TO REQUEST A CONTESTED CASE HEARING, YOU MUST INCLUDE THE FOLLOWING ITEMS IN YOUR REQUEST: your name, address, phone number; applicant's name and proposed permit number; the location and distance of your property/activities relative to the proposed facility; a specific description of how you would be adversely affected by the facility in a way not common to the general public; a list of all disputed issues of fact that you submit during the comment period and, the statement "[I/we] request a contested case hearing." If the request for contested case hearing is filed on behalf of a group or association, the request must designate the group's representative for receiving future correspondence; identify by name and physical address an individual member of the group who would be adversely affected by the proposed facility or activity; provide the information discussed above regarding the affected member's location and distance from the facility or activity; explain how and why the member would be affected; and explain how the interests the group seeks to protect are relevant to the group's purpose.

Following the close of all applicable comment and request periods, the Executive Director will forward the application and any requests for reconsideration or for a contested case hearing to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

The Commission may only grant a request for a contested case hearing on issues the requestor submitted in their timely comments that were not subsequently withdrawn. **If a hearing is granted, the subject of a hearing will be limited to disputed issues of fact or mixed questions of fact and law relating to relevant and material water quality concerns submitted during the comment period.**

TCEQ may act on an application to renew a permit for discharge of wastewater without providing an opportunity for a contested case hearing if certain criteria are met.

MAILING LIST. If you submit public comments, a request for a contested case hearing or a reconsideration of the Executive Director's decision, you will be added to the mailing list for this specific application to receive future public notices mailed by the Office of the Chief Clerk. In addition, you may request to be placed on: (1) the permanent mailing list for a specific applicant name and permit number; and/or (2) the mailing list for a specific county. If you wish to be placed on the permanent and/or the county mailing list, clearly specify which list(s) and send your request to TCEQ Office of the Chief Clerk at the address below.

INFORMATION AVAILABLE ONLINE. For details about the status of the application, visit the Commissioners' Integrated Database at www.tceq.texas.gov/goto/cid. Search the database using the permit number for this application, which is provided at the top of this notice.

AGENCY CONTACTS AND INFORMATION. All public comments and requests must be submitted either electronically at **https://www14.tceq.texas.gov/epic/eComment/**, or in writing to the Texas Commission on Environmental Quality, Office of the Chief Clerk, MC-105, P.O. Box 13087, Austin, Texas 78711-3087. Please be aware that any contact information you provide, including your name, phone number, email address and physical address will become part of the agency's public record. For more information about this permit application or the permitting process, please call the TCEQ Public Education Program, Toll Free, at 1-800-687-4040 or visit their website at www.tceq.texas.gov/goto/pep. Si desea información en Español, puede llamar al 1-800-687-4040.

Further information may also be obtained from Undine Texas Environmental, LLC at the address stated above or by calling Mr. Jeff Goebel, at 713-574-5953, Extension 3005.

Issuance Date: July 3, 2024

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA
RENOVACION

PERMISO NO. WQ0013643001

SOLICITUD. Undine Texas Environmental, LLC, 17681 Telge Road, Cypress, Texas 77429, ha solicitado a la Comisión de Calidad Ambiental de Texas (TCEQ) renovar el permiso del Sistema de Eliminación de Descargas Contaminantes de Texas (TPDES) No. WQ0013643001 (ID de EPA No. TX0042081) para autorizar la descarga de aguas residuales tratadas en un volumen que no exceda un flujo promedio diario de 100,000 galones por día. La instalación de tratamiento de aguas residuales domésticas. está ubicado aproximadamente a 1.5 millas al sureste de la intersección de Farm-to-Market Road 1405 y Farm-to-Market Road 2354, en el lado sur de Farm-to-Market Road 2354, en el condado de Chambers, Texas 77523. La ruta de descarga es desde el sitio de la planta directamente a Upper Galveston Bay. La TCEQ recibió esta solicitud el 11 de octubre de 2023. La solicitud de permiso estará disponible para ver y copiar en la Biblioteca Municipal Sterling, 1 Mary Elizabeth Wilbanks Avenue, Baytown, en el condado de Chambers, Texas, antes de la fecha de publicación de este aviso en el periódico. La solicitud (cualquier actualización y aviso inclusive) está disponible electrónicamente en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications . Este enlace a un mapa electrónico de la ubicación general del sitio o instalación se proporciona como cortesía pública y no forma parte de la solicitud o aviso. Para conocer la ubicación exacta, consulte la aplicación.
https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.896944,29.661944&level=18

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.**

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión. La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios. Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo, la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Ademas, puede pedir que la TCEQ ponga su nombre en una or mas de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos de el solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas

designe cual lista(s) y envia por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

CONTACTOS E INFORMACIÓN DE LA TCEQ. Todos los comentarios escritos del público y los para pedidos una reunión deben ser presentados a la Oficina del Secretario Principal, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 o por el internet at www.tceq.texas.gov/about/comments.html. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Si necesita más información en Español sobre esta solicitud para un permiso o el proceso del permiso, por favor llame a El Programa de Educación Pública de la TCEQ, sin cobro, al 1-800-687-4040. La información general sobre la TCEQ puede ser encontrada en nuestro sitio de la red: www.tceq.texas.gov.

También se puede obtener información adicional del Undine Texas Environmental, LLC a la dirección indicada arriba o llamando a Jeff Goebel al 713-574-5953, extension 3005

Fecha de emission: 3 de julio de 2024

Erwin Madrid

From: Jeff Goebel <jgoebel@undinellc.com>
Sent: Tuesday, July 2, 2024 12:23 PM
To: Erwin Madrid
Subject: RE: Application for Permit No. WQ0013643001 - Notice of Deficiency Letter
Attachments: Admin page.pdf; dom-tpdes-renew-nori-murechno.docx; Municipal TPDES and TLAP PLS english and spanish.docx

1. The application indicates that the individual responsible for signing the application is Mr. Vance Tillman, CFO. However, the application was signed by Carey Thomas, Vice President. Please confirm who is responsible for signing the application. If you want to have Mr. Tillman, be the authorized signatory, a new notarized signature page will be required.
    a. See revised page

2. Plain Language Summaries: Please complete the attached plain language summary templates (English & Spanish).
    a. See attached for English and spanish

3. The Notice of Receipt and Intent is provided below, please review carefully and let me know if there are any error or omissions. Additionally, please use the attached Spanish NORI template to translate the notice portion into Spanish:
    a. See attached

Please let me know if you need anything else.

Thank you

Jeff Goebel

From: Erwin Madrid <Erwin.Madrid@tceq.texas.gov>
Sent: Tuesday, June 25, 2024 4:47 PM
To: Jeff Goebel <jgoebel@undinellc.com>
Subject: RE: Application for Permit No. WQ0013643001 - Notice of Deficiency Letter
Importance: High

Hi Mr. Goebel,

I am following up on this permit application; I reviewed the response you provided; however, I am still missing a few items to declare the application administratively complete. Please the items below and submit the complete response as soon as possible:

1. The application indicates that the individual responsible for signing the application is Mr. Vance Tillman, CFO. However, the application was signed by Carey Thomas, Vice President. Please confirm who is responsible for signing the application. If you want to have Mr. Tillman, be the authorized signatory, a new notarized signature page will be required.

2. Plain Language Summaries: Please complete the attached plain language summary templates (English & Spanish).

3. The Notice of Receipt and Intent is provided below, please review carefully and let me know if there are any error or omissions. Additionally, please use the attached Spanish NORI template to translate the notice portion into Spanish:

   APPLICATION. Undine Texas Environmental, LLC, 17681 Telge Road, Cypress, Texas 77429, has applied to the Texas Commission on Environmental Quality (TCEQ) to renew Texas Pollutant Discharge Elimination System (TPDES) Permit No. WQ0013643001 (EPA I.D. No. TX0042081) to authorize the discharge of treated wastewater at a volume not to exceed a daily average flow of 100,000 gallons per day. The domestic wastewater treatment facility is located approximately 1.5 miles southeast of the intersection of Farm-to-Market Road 1405 and Farm-to-Market Road 2354, on the south side of Farm-to-Market Road 2354, in Chambers County, Texas 77523. The discharge route is from the plant site to directly to Upper Galveston Bay. TCEQ received this application on October 11, 2023. The permit application will be available for viewing and copying at Sterling Municipal Library, 1 Mary Elizabeth Wilbanks Avenue, Baytown, in Chambers County, Texas prior to the date this notice is published in the newspaper. The application, including any updates, and associated notices are available electronically at the following webpage: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications. This link to an electronic map of the site or facility's general location is provided as a public courtesy and not part of the application or notice. For the exact location, refer to the application. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.896944,29.661944&level=18

   Further information may also be obtained from Undine Texas Environmental, LLC at the address stated above or by calling Mr. Jeff Goebel, Undine Texas Environmental, LLC, at 713-574-5953.

If you have any questions/concerns, please let me know. Please provide your response as soon as possible.

Regards,

Erwin Madrid
Team Lead
ARP Team | Water Quality Division
512-239-2191
Texas Commission on Environmental Quality

From: Jeff Goebel <jgoebel@undinellc.com>
Sent: Tuesday, May 28, 2024 12:07 PM

To: Erwin Madrid <Erwin.Madrid@tceq.texas.gov>
Subject: RE: Application for Permit No. WQ0013643001 - Notice of Deficiency Letter

Erwin,

Please see response that will be overnighted to you today.
I am still lacking the effluent results and a letter from the sludge hauler, but both should be done in the next week or two.

. Please let me know if you need anything else.

Thank you

Jeff Goebel

From: Erwin Madrid <Erwin.Madrid@tceq.texas.gov>
Sent: Friday, May 24, 2024 2:46 PM
To: texaswater@sbcglobal.net
Cc: Jeff Goebel <jgoebel@undinellc.com>
Subject: Application for Permit No. WQ0013643001 - Notice of Deficiency Letter
Importance: High

Dear applicant,

The attached Notice of Deficiency letter sent on **May 24, 2024**, requests additional information needed to declare the application administratively complete. Please send the complete response to my attention by **June 7, 2024**.

NEW Public Involvement Plan (PIP) Forms Required for Certain Individual Wastewater and Stormwater Permit Applications
All new and major amendment wastewater and stormwater individual permit applications received on or after **November 1, 2022**, must now include a completed Public Involvement Plan (PIP) form. Individual permit applications are being updated to explicitly include this new requirement.

- **PIP Form (TCEQ Form-20960)**
- **PIP Form Instructions (TCEQ Form-20960-inst)**

Regards,

Erwin Madrid
Team Lead
ARP Team | Water Quality Division
512-239-2191
Texas Commission on Environmental Quality

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 29)

A. The owner of the facility must apply for the permit.

What is the Legal Name of the entity (applicant) applying for this permit?

Undine Texas Environmental, LLC

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 604519330

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix (Mr., Ms., Miss): Ms

First and Last Name: Carey Thomas

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: VP

B. Co-applicant information. Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

None

(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN: Click here to enter text.

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44*.

Prefix (Mr., Ms., Miss): Click here to enter text.

First and Last Name: Click here to enter text.

Credential (P.E, P.G., Ph.D., etc.): Click here to enter text.

Title: Click here to enter text.

Provide a brief description of the need for a co-permittee: Click here to enter text.

Comisión de Calidad Ambiental del Estado de Texas

AVISO DE RECIBO DE LA SOLICITUD Y
EL INTENTO DE OBTENER PERMISO PARA LA CALIDAD DEL AGUA
RENOVACION

PERMISO NO. WQ0013643001

SOLICITUD. Undine Texas Environmental, LLC, 17681 Telge Road, Cypress, Texas 77429, ha solicitado a la Comisión de Calidad Ambiental de Texas (TCEQ) renovar el permiso del Sistema de Eliminación de Descargas Contaminantes de Texas (TPDES) No. WQ0013643001 (ID de EPA No. TX0042081) para autorizar la descarga de aguas residuales tratadas en un volumen que no exceda un flujo promedio diario de 100,000 galones por día. La instalación de tratamiento de aguas residuales domésticas. está ubicado aproximadamente a 1.5 millas al sureste de la intersección de Farm-to-Market Road 1405 y Farm-to-Market Road 2354, en el lado sur de Farm-to-Market Road 2354, en el condado de Chambers, Texas 77523. La ruta de descarga es desde el sitio de la planta directamente a Upper Galveston Bay. La TCEQ recibió esta solicitud el 11 de octubre de 2023. La solicitud de permiso estará disponible para ver y copiar en la Biblioteca Municipal Sterling, 1 Mary Elizabeth Wilbanks Avenue, Baytown, en el condado de Chambers, Texas, antes de la fecha de publicación de este aviso en el periódico. La solicitud, incluidas las actualizaciones y los avisos asociados, están disponibles electrónicamente en la siguiente página web: https://www.tceq.texas.gov/permitting/wastewater/pending-permits/tpdes-applications . Este enlace a un mapa electrónico de la ubicación general del sitio o instalación se proporciona como cortesía pública y no forma parte de la solicitud o aviso. Para conocer la ubicación exacta, consulte la aplicación. https://gisweb.tceq.texas.gov/LocationMapper/?marker=-94.896944,29.661944&level=18

AVISO ADICIONAL. El Director Ejecutivo de la TCEQ ha determinado que la solicitud es administrativamente completa y conducirá una revisión técnica de la solicitud. Después de completar la revisión técnica, el Director Ejecutivo puede preparar un borrador del permiso y emitirá una Decisión Preliminar sobre la solicitud. **El aviso de la solicitud y la decisión preliminar serán publicados y enviado a los que**

están en la lista de correo de las personas a lo largo del condado que desean recibir los avisos y los que están en la lista de correo que desean recibir avisos de esta solicitud. El aviso dará la fecha límite para someter comentarios públicos.

COMENTARIO PUBLICO / REUNION PUBLICA. Usted puede presentar comentarios públicos o pedir una reunión pública sobre esta solicitud. El propósito de una reunión pública es dar la oportunidad de presentar comentarios o hacer preguntas acerca de la solicitud. La TCEQ realiza una reunión pública si el Director Ejecutivo determina que hay un grado de interés público suficiente en la solicitud o si un legislador local lo pide. Una reunión pública no es una audiencia administrativa de lo contencioso.

OPORTUNIDAD DE UNA AUDIENCIA ADMINISTRATIVA DE LO CONTENCIOSO. Después del plazo para presentar comentarios públicos, el Director Ejecutivo considerará todos los comentarios apropiados y preparará una respuesta a todo los comentarios públicos esenciales, pertinentes, o significativos. **A menos que la solicitud haya sido referida directamente a una audiencia administrativa de lo contencioso, la respuesta a los comentarios y la decisión del Director Ejecutivo sobre la solicitud serán enviados por correo a todos los que presentaron un comentario público y a las personas que están en la lista para recibir avisos sobre esta solicitud. Si se reciben comentarios, el aviso también proveerá instrucciones para pedir una reconsideración de la decisión del Director Ejecutivo y para pedir una audiencia administrativa de lo contencioso.** Una audiencia administrativa de lo contencioso es un procedimiento legal similar a un procedimiento legal civil en un tribunal de distrito del estado.

PARA SOLICITAR UNA AUDIENCIA DE CASO IMPUGNADO, USTED DEBE INCLUIR EN SU SOLICITUD LOS SIGUIENTES DATOS: su nombre, dirección, y número de teléfono; el nombre del solicitante y número del permiso; la ubicación y distancia de su propiedad/actividad con respecto a la instalación; una descripción específica de la forma cómo usted sería afectado adversamente por el sitio de una manera no común al público en general; una lista de todas las cuestiones de hecho en disputa que usted presente durante el período de comentarios; y la declaración "[Yo/nosotros] solicito/solicitamos una audiencia de caso impugnado". Si presenta la petición para una audiencia de caso impugnado de parte de un grupo o asociación, debe identificar una persona que representa al grupo para recibir correspondencia en el futuro; identificar el nombre y la dirección de un miembro del grupo que sería afectado adversamente por la planta o la actividad propuesta; proveer la información indicada anteriormente con respecto a la ubicación del miembro afectado y su distancia de la planta o actividad propuesta; explicar cómo y porqué el miembro sería afectado; y explicar cómo los intereses que el grupo desea proteger son pertinentes al propósito del grupo.

Después del cierre de todos los períodos de comentarios y de petición que aplican, el Director Ejecutivo enviará la solicitud y cualquier petición para reconsideración o para una audiencia de caso impugnado a los Comisionados de la TCEQ para su consideración durante una reunión programada de la Comisión. La Comisión sólo puede conceder una solicitud de una audiencia de caso impugnado sobre los temas que el solicitante haya presentado en sus comentarios oportunos que no fueron retirados posteriormente. Si se concede una audiencia, el tema de la audiencia estará limitado a cuestiones de hecho en disputa o cuestiones mixtas de hecho y de derecho relacionadas a intereses pertinentes y materiales de calidad del agua que se hayan presentado durante el período de comentarios. *[For renewal applications that **do not** include a major amendment, include the following sentence:]* **Si ciertos criterios se cumplen, la TCEQ puede actuar sobre una solicitud para renovar un permiso sin proveer una oportunidad de una audiencia administrativa de lo contencioso.**

LISTA DE CORREO. Si somete comentarios públicos, un pedido para una audiencia administrativa de lo contencioso o una reconsideración de la decisión del Director Ejecutivo, la Oficina del Secretario Principal enviará por correo los avisos públicos en relación con la solicitud. Ademas, puede pedir que la TCEQ ponga su nombre en una or mas de las listas correos siguientes (1) la lista de correo permanente para recibir los avisos de el solicitante indicado por nombre y número del permiso específico y/o (2) la lista de correo de todas las solicitudes en un condado especifico. Si desea que se agrega su nombre en una de las listas designe cual lista(s) y envia por correo su pedido a la Oficina del Secretario Principal de la TCEQ.

CONTACTOS E INFORMACIÓN DE LA TCEQ. Todos los comentarios escritos del público y los para pedidos una reunión deben ser presentados a la Oficina del Secretario Principal, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087 o por el internet at www.tceq.texas.gov/about/comments.html. Tenga en cuenta que cualquier información personal que usted proporcione, incluyendo su nombre, número de teléfono, dirección de correo electrónico y dirección física pasarán a formar parte del registro público de la Agencia. Si necesita más información en Español sobre esta solicitud para un permiso o el proceso del permiso, por favor llame a El Programa de Educación Pública de la TCEQ, sin cobro, al 1-800-687-4040. La información general sobre la TCEQ puede ser encontrada en nuestro sitio de la red: www.tceq.texas.gov.

También se puede obtener información adicional del **.** Undine Texas Environmental, LLC a la dirección indicada arriba o llamando a Jeff Goebel al 713-574-5953

Fecha de emisión _____ *[Date notice issued]*

Undine Texas Environmental, LLC. (CN604519330) operates the Bayridge wastewater treatment plant (RN 102342268), an activated sludge process plant operated in the complete mix mode. Located approximately 1.5 miles southeast of the intersection of Farm-to-Market Road 1405 and Farm-to-Market Road 2354, on the south side of Farm-to-Market Road 2354, in Chambers County, Texas 77523

This application is for a renewal to discharge at an annual average flow of 100,000 gallons per day of treated domestic wastewater via Outfall 001.

Discharges from the facility are expected to contain five-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), ammonia nitrogen (NH_3-N), and *Escherichia coli*. Additional potential pollutants are included in the Domestic Technical Report 1.0, Section 7. Pollutant Analysis of Treated Effluent and Domestic Worksheet 4.0 in the permit application package. Domestic wastewater is treated by an activated sludge process plant and the treatment units include a bar screen, aeration basins, final clarifiers, sludge digesters and chlorine contact chambers

Undine Texas Environmental, LLC. (CN604519330) opera la planta de tratamiento de aguas residuales de Bayridge (RN 102342268), una planta de proceso de lodos activados operada en modo de mezcla completa. aproximadamente 1,5 millas al sureste de la intersección de Farm-to-Market Road 1405 y Farm-to-Market Road 2354, en el lado sur de Farm-to-Market Road 2354, en el condado de Chambers, Texas 77523

Esta solicitud es para una renovación para descargar a un flujo promedio anual de 100,000 galones por día de aguas residuales domésticas tratadas a través del Emisario 001.

Se espera que las descargas de la instalación contengan demanda bioquímica de oxígeno carbonoso ($CBOD_5$), sólidos suspendidos totales (TSS), nitrógeno amoniacal (NH_3-N) y *Escherichia coli durante cinco días* . Se incluyen contaminantes potenciales adicionales en el Informe Técnico Nacional 1.0, Sección 7. Análisis de Contaminantes del Efluente Tratado y Hoja de Trabajo Doméstico 4.0 en el paquete de solicitud de permiso. Las aguas residuales domésticas son tratadas mediante una planta de proceso de lodos activados y las unidades de tratamiento incluyen criba de barras, balsas de aireación, clarificadores finales, digestores de lodos y cámaras de contacto de cloro.

May 28, 2024

Erwin Madrid
Applications Review and Processing Team (MC148)
Water Quality Division
Texas Commission of Environmental Quality
Building F, Room 2101
12100 Park 35 Circle
Austin, Texas 78753

Re: Application to Amend Permit No.: WQ0013643001 (EPA I.D. No. TX0042081)
Applicant Name: Undine Texas Environmental, LLC (CN604519330)
Site Name: Bayridge WWTP (RN102342268)

Mr. Madrid,
In response to your letter dated May 24, 2024, please see my responses below:

1. The application type is listed as a Major Amendment with Renewal, however, the required fee for a Major Amendment could not be located. Please submit the required fee or provide proof of payment made to our office.
    a. Please see revised page 2 of the application. This application is for a renewal without changes. In addition please see attached check in the amount of $815.00.

2. The Major Amendment request listed on the application is insufficient. Please clarify and provide a detailed explanation of the amendment request being sought in the permit application.
    a. This application is for a renewal without changes.

3. The application submitted to amend the Water Quality permit for Undine Texas Environmental, LLC cannot be reviewed as submitted. The permit application that was submitted was incomplete and missing the Core Data Form, Administrative Report 1.1, required USGS maps, technical worksheets, and Title VI components of the application process.
    a. Please see attachments that should satisfy this NOD.

4. Not able to comment on this item until NORI is completed.
5. Not able to comment on this item until NORI is completed.\

Please renew the attached info and comment with any additional items needed.

Thank you,

Jeff Goebel

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION CHECKLIST

Complete and submit this checklist with the application.

APPLICANT: Undine Texas Environmental, LLC

PERMIT NUMBER: WQ0013643001

Indicate if each of the following items is included in your application.

	Y	N		Y	N
Administrative Report 1.0	☒	☐	Original USGS Map	☒	☐
Administrative Report 1.1	☐	☒	Affected Landowners Map	☐	☒
SPIF	☒	☐	Landowner Disk or Labels	☐	☒
Core Data Form	☒	☐	Buffer Zone Map	☒	☐
Public Involvement Plan Form	☐	☒	Flow Diagram	☒	☐
Technical Report 1.0	☒	☐	Site Drawing	☒	☒
Technical Report 1.1	☐	☒	Original Photographs	☐	☒
Worksheet 2.0	☒	☐	Design Calculations	☐	☒
Worksheet 2.1	☐	☒	Solids Management Plan	☐	☒
Worksheet 3.0	☐	☒	Water Balance	☐	☒
Worksheet 3.1	☐	☐			
Worksheet 3.2	☐	☒			
Worksheet 3.3	☐	☒			
Worksheet 4.0	☐	☒			
Worksheet 5.0	☐	☒			
Worksheet 6.0	☐	☒			
Worksheet 7.0	☐	☒			

For TCEQ Use Only

Segment Number _____ County _____

Expiration Date _____ Region _____

Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION FOR A DOMESTIC WASTEWATER PERMIT ADMINISTRATIVE REPORT 1.0

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

Section 1. Application Fees (Instructions Page 29)

Indicate the amount submitted for the application fee (check only one).

Flow	New/Major Amendment	Renewal
<0.05 MGD	$350.00 ☐	$315.00 ☐
≥0.05 but <0.10 MGD	$550.00 ☐	$515.00 ☐
≥0.10 but <0.25 MGD	$850.00 ☐	$815.00 ☒
≥0.25 but <0.50 MGD	$1,250.00 ☐	$1,215.00 ☐
≥0.50 but <1.0 MGD	$1,650.00 ☐	$1,615.00 ☐
≥1.0 MGD	$2,050.00 ☐	$2,015.00 ☐

Minor Amendment (for any flow) $150.00 ☐

Payment Information:

Mailed Check/Money Order Number: 7532

Check/Money Order Amount: $815.00

Name Printed on Check: Undine Texas Environmental, LLC

EPAY Voucher Number: [redacted]

Copy of Payment Voucher enclosed? Yes ☐

Section 2. Type of Application (Instructions Page 29)

☐ New TPDES

☐ Major Amendment *with* Renewal

☐ Major Amendment *without* Renewal

☒ Renewal without changes

☐ New TLAP

☐ Minor Amendment *with* Renewal

☐ Minor Amendment *without* Renewal

☐ Minor Modification of permit

For amendments or modifications, describe the proposed changes: [redacted]

For existing permits:

Permit Number: QWQ0013643001

EPA I.D. (TPDES only): TX0042081

Expiration Date: 10/12/23

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided.)*

☐ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application.)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☒ Other **Permit Transfer**

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 603827353		RN 102342268

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☐ Update to Customer Information ☒ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*	*If new Customer, enter previous Customer below:*
Undine Texas Environmental, LLC	Nerro Supply, LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
801768069	N/A	46-3168815	N/A

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☐ Limited

Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☒ Other: LLC

12. Number of Employees ☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated? ☒ Yes ☐ No

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following:*

☐ Owner ☐ Operator ☒ Owner & Operator

15. Mailing Address:							
	17681 Telge Rd						
	City	Cypress	State	TX	ZIP	77429	ZIP + 4

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*
	cthomas@undinellc.com

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(713) 554-7820		(713) 647-0277

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC.)

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Bayridge Wastewater Treatment Facility

23. Street Address of the Regulated Entity: *(No PO Boxes)*								
	City		State		ZIP		ZIP + 4	
24. County	Chambers							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	1.5 miles southeast of the intersection of FM 1405 and FM 2354, on the south side of FM 2354

26. Nearest City	State	Nearest ZIP Code
Baytown	TX	77523

27. Latitude (N) In Decimal:	29.661819		28. Longitude (W) In Decimal:	94.896892	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)	31. Primary NAICS Code (5 or 6 digits)	32. Secondary NAICS Code (5 or 6 digits)
4952			

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Wastewater Treatment

34. Mailing Address:	17681 Telge Rd							
	City	Cypress	State	TX	ZIP	77429	ZIP + 4	

35. E-Mail Address:	cthomas@undinellc.com

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
(713) 554-7820		(713) 647-0277

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

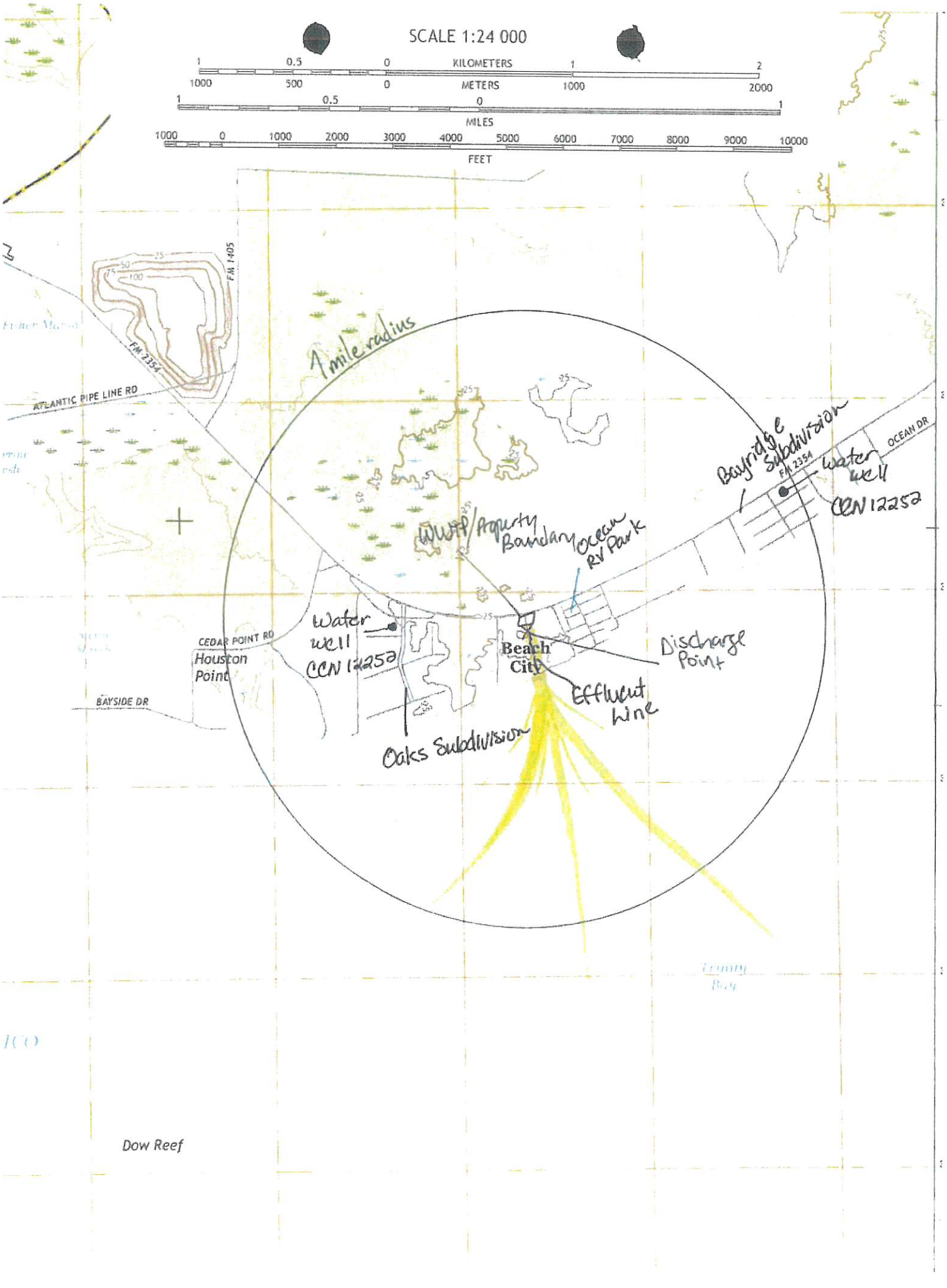
40. Name:	Jeff Goebel	41. Title:	Manager of Business Development

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(713) 574-7758		(713) 647-0277	jgoebel@undinellc.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Undine Texas Environmental, LLC	Job Title:	CFO
Name *(In Print)* :	Vance Tillman	Phone:	(713) 554-7820
Signature:		Date:	05/28/24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1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET
FM 1405
FM 2354
ATLANTIC PIPE LINE RD
1 mile radius
WWTP/Property Boundary
Ocean RV Park
Bayridge Subdivision
FM 2354
Water well CCN 12252
OCEAN DR
CEDAR POINT RD
Houston Point
Water well CCN 12252
Beach City
Discharge Point
Effluent line
BAYSIDE DR
Oaks Subdivision
Dow Reef

Nerro Supply, LLC
WQ0013643001
December 2017

Gulf Coast Environmental
Health & Safety llc

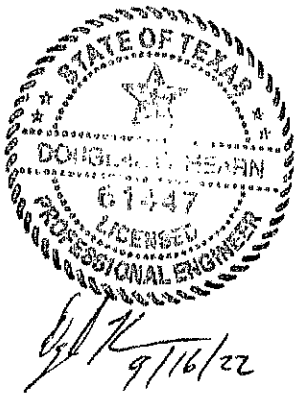
UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
CHAMBERS COUNTY, TEXAS
TPDES NO. WQ0013643001

SEPTEMBER, 2022

PREPARED BY:

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PHONE 512-310-0176
FIRM # F-1234



BAYRIDGE WWTP DESIGN REPORT
CHAMBERS COUNTY, TEXAS
UNDINE

ENGINEER: Douglas Hearn, P.E., R.P.L.S.
Hearn Engineering, Inc.
P.O. Box 1104
Cameron, Texas 76520

DATE: 09/16/22

DESIGN PARAMETERS:

Permitted Flows:

Average Daily Flow =	0.100 mgd =	69	gpm (Qavg)
2-hour Peak Flow =	0.30 mgd =	208	gpm (Qpk)
Peak Factor =	3.0		

Influent Strength:

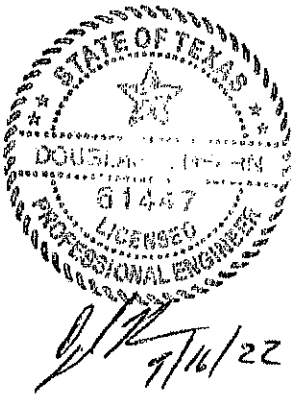
CBOD5 =	250 mg/l =	209	ppd
TSS =	250 mg/l =	209	ppd
NH3-N =	40 mg/l =	33	ppd

Effluent Limits:

$CBOD_5$ =	10 mg/l
TSS =	15 mg/l
NH_3-N =	3 mg/l
D.O. =	4 mg/l

Process Design: The existing treatment plant utilizes the extended aeration process. The proposed modifications are intended to replace the existing plant with similar process which will produce effluent that will meet the permit requirements of BOD5 = 10 mg/l, TSS = 15 mg/l, D.O. - 4 mg/l, pH between 6.0 and 9.0 standard units, and Chlorine Residual = 1 mg/l after 20 minute detention time at an average daily flow of 100,000 gpd. The anticipated operating range for MLSS is 3,000 mg/l.

Design Features: The two existing gravity collection systems flow to the lift stations which pump to the plant. Flows into the plant will enter thru a bar screen. After passing thru the aeration basin, flows automatically transfer aerated sludge into the clarifier. Clear water will overflow the perimeter weirs and travel to a new chlorine contact chamber where it is dosed with liquid chlorine by a chemical feed pump. The chamber is sized to allow 20 minute detention time prior to beind discharged into the pipe to the bay. Settled sludge from the clarifiers will either be returned to the aeration basin where it will be mixed with the influent (RAS) or wasted to the sludge holding basin (WAS) where it can be thickened before being liquid hauled to a TCEQ approved facility by a TCEQ licensed hauler. Three regenerative blowers will provide air for the aeration basin, sludge holding, chlorine contact, and the air lift pumps while reducing noise. The plant design includes a manual transfer switch for a generator. An alarm dialer has been installed on the plant to alert personnel in the event of power outages and high levels.



BAYRIDGE WWTP DESIGN REPORT

AERATION BASIN:

Criteria:

Organic Loading =	30	lbs BOD_5/1,000 cf
Oxygen Requirement =	2.2	lbs/lb BOD_5
	4.6	lbs/lb NH_3 - N

Volume Required:

Influent BOD_5 =	209	ppd
Minimum Volume =	6,950	cf

Basin Dimensions:

Number of Basins =	1.00	
Sidewater Depth =	10.0	ft
Basin Dimensions =	12.0	ft Wide x 58.0 ft Long
Actual Basin Area =	696	sf
Actual Basin Volume =	6,960	cf

Actual Loading:

Organic Loading =	30.0	lbs BOD_5/1,000 cf

Oxygen Requirement:

$$O_2R = (1.2(BOD_5)+4.3(NH_3\text{-}N))/BOD_5)$$

O_2R = 1.89 lbs O_2 / lbs BOD_5

Airflow Requirement:

$$RAF = \frac{(PPD\ BOD_5 * O_2R)}{(WOTE*0.23*0.075*1440)}$$

Diffuser Eff. = 4%

RAF = 396 scfm

TCEQ Minumum Air Requirement = 3,200 * lbs BOD_5/1440

= 463 cfm

Aeration System:

Number of Diffusers =	19	
Airflow per Diffuser =	25	scfm/diffuser
Diffuser Submergence =	8.00	ft

BAYRIDGE WWTP DESIGN REPORT

CLARIFIER:

Criteria:

Surface Loading =	600	gpd/sf @ average flow
	1,200	gpd/sf @ peak flow
Detention Time =	3.0	hrs @ average flow
	1.8	hrs @ peak flow
R.A.S. Rate =	150%	

Basin Requirements:

@ Average Flow =	167	sf
	1,671	cf
@ Peak Flow =	250	sf
	3,008	cf
Number of Basins =	1	
Minimum Diameter =	17.8	ft

Basin Dimensions:

Number of Basins =	1	
Basin Diameter =	18.0	ft
Sidewater Depth =	10.0	ft
Actual Surface Area =	254	sf
Actual Volume =	2,545	cf

Actual Surface Loading:

@ Average Flow =	393	gpd/sf
@ Peak Flow =	1,179	gpd/sf

Actual Detention Time:

@ Average Flow =	4.6	hrs
@ Peak Flow =	1.5	hrs

Weir Loading Rate =	20,000	gpd/lf @ peak flow
Min. Required Weir Length =	15.0	lf

CHLORINE CONTACT CHAMBER:

Criteria:

Detention Time =	20	min @ peak flow
Airflow =	20	scfm/1,000 cf

Volume Required:

Peak Flow =	208	gpm
Minimum Volume =	557	cf

Basin Dimensions:

Number of Basins =	1			
Sidewater Depth =	7.0	ft @ peak flow		
Basin O.D. =	12.0	ft x	8.0	ft
Actual Basin Area =	96.0	sf		
Actual Basin Volume =	672	cf		

Aeration System:

Airflow =	13	scfm
Number of Diffusers =	1	
Airflow per Diffuser =	20	scfm/diffuser
Diffuser Submergence =	6.0	ft

BAYRIDGE WWTP DESIGN REPORT

SOLIDS HANDLING:

Criteria:

TCEQ Basin Design Volume =	10	cf/lb BOD_5/day		
TCEQ Min. Required Airflow =	30	scfm/1000 cf		
Min. Sludge Retention =	15	days		
Influent BOD_5 =	250	mg/l =	209	ppd
Effluent BOD_5 =	10	mg/l =	8	ppd
Removed BOD_5 =	240	mg/l =	200	ppd
Required Volume =	2,002	cf		

Basin Dimensions:

Number of Basins =	1			
Sidewater Depth =	10.5	ft		
Basin Dim. =	12.0	ft x	16.0	ft
Actual Basin Area =	192	sf		
Actual Basin Volume =	2,016	cf		

Aeration System:

Required Airflow =	60	scfm
Number of Diffusers =	3	
Airflow per Diffuser =	20	
Diffuser Submergence =	8.5	ft

BLOWERS REQUIRED:

Aeration Basin		463 scfm
Chlorine Contact Basin		13 scfm
Digester		60 scfm
Air Lift @ 10 scfm/ea	4	40 scfm
Total Aeration Required		577 scfm

UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM

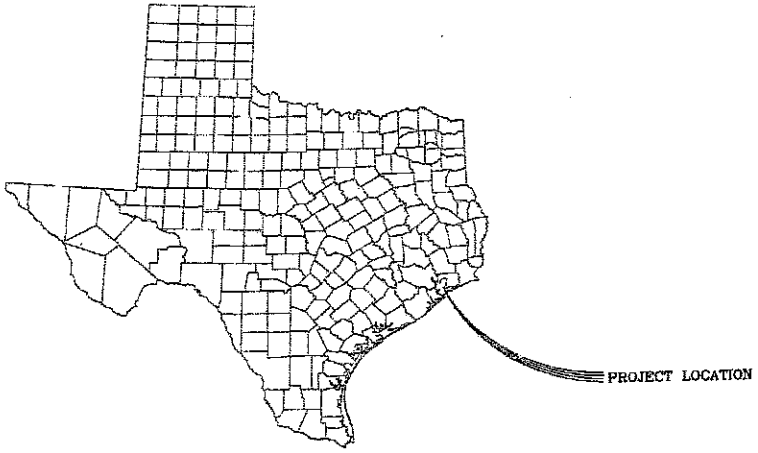
WASTEWATER PLANT IMPROVEMENTS

CHAMBERS CO., TEXAS

TPDES NO. WQ0013643001

GENERAL NOTES:

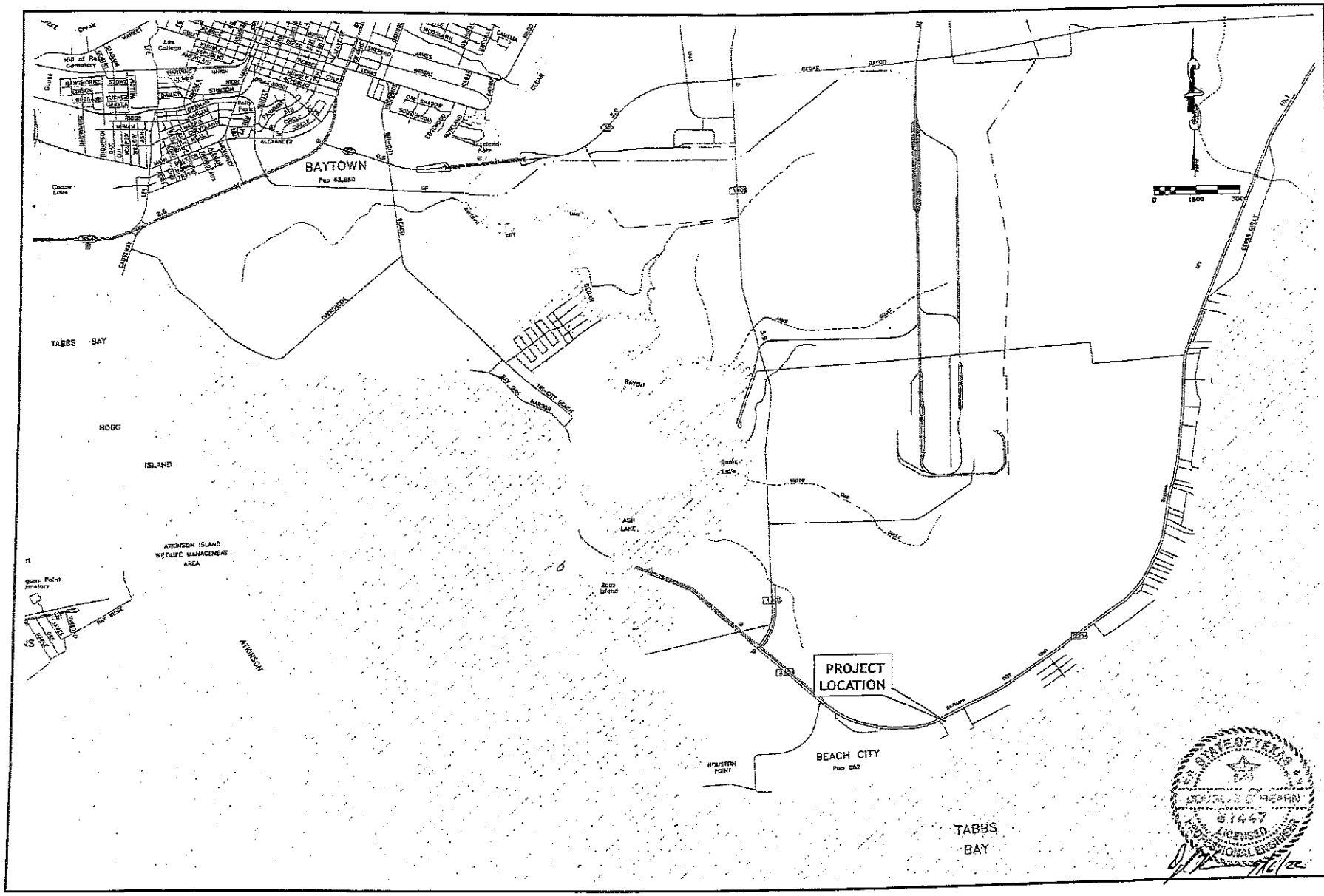
1. The contractor shall be liable for damage to improvements and utilities along the access route and at or near the worksite. Utilities may exist and not be shown on the construction drawings. The site shall be carefully scrutinized for evidence of utilities. As a minimum, prior to any ground disturbance, the number 811 shall be called to ascertain if underground utilities exist in the general work area. Calling the number will only confirm the existence of underground utilities owned by companies that subscribe to one of these organizations. There may be other underground utilities in the work area. The contractor shall notify the owners of all utilities a minimum of (10) days in advance of the intent to perform work in the affected area. The notice shall be in writing and a copy shall be furnished to the contracting officer.
2. All work shall be in accordance with TCEQ rules and regulations (chapter 290). All newly installed pipes and related products must conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI as required by 290.44(a)(1) of the rules. All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less as required in 290.44(a)(2) of the rules. Disinfection shall be in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service.
3. The contractor shall not attempt to determine locations by scaling from the plans. While every attempt has been made to prepare these plans to scale, the Engineer shall be consulted if clarifications are needed.
4. The contractor shall verify the location and elevations of all existing utilities prior to beginning constructed.
5. Conflicts with the proposed work shall be brought to the attention of the Engineer immediately.
6. The contractor shall notify the Engineer twenty-four (24) hours prior to beginning construction.
7. All underground fittings shall be mechanical joint restrained with Mega Lugs or other system approved by the Engineer. All above ground piping shall be flanged or threaded.
8. Proposed piping above ground shall be threaded schedule 40 G.I.P. up to 4" and schedule 40 fabricated steel or flanged D.I. for larger. All in ground piping shall be either schedule 40 G.I.P. or schedule 80 PVC.
9. Final grading shall insure proper drainage & be accomplished with top soil, once grading is completed, the area shall be revegetated with hydromulch which shall be maintained until there is a min. coverage of 90% with no area larger than ten square feet. All areas exposed construction shall be revegetated.
10. It is the intent of these plans and specifications that the contractor shall provide an installation that is complete. All items necessary, reasonably incidental or customarily included, shall be provided.



SHEET INDEX

HEARN ENGINEERING INC.
P.O. Box 1164 - Cameron, Texas 76520 - (512) 310-0176 - FIRM # F-1234

STATE OF TEXAS
HEARN
91447
LICENSED
PROFESSIONAL ENGINEER
7/12/22



NO.	REVISIONS	DATE

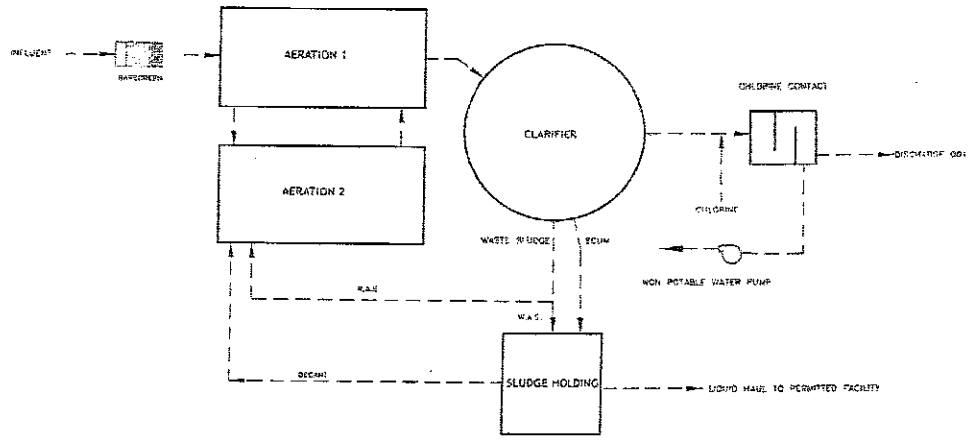
DESIGNED BY: DCH
DRAWN BY: DCH
CHECKED BY: DCH
SCALE: 1" = 3,000'
DATE: 6/2022

UNDINE LLC
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
VICINITY MAP
CHAMBERS COUNTY, TEXAS

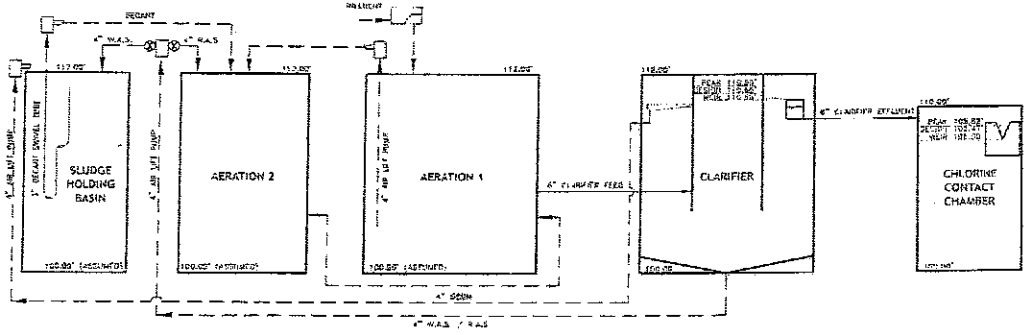
HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

STATE OF TEXAS
JACKSON C. HEARN
81447
LICENSED
PROFESSIONAL ENGINEER

SHEET
2



FLOW DIAGRAM



HYDRAULIC PROFILE

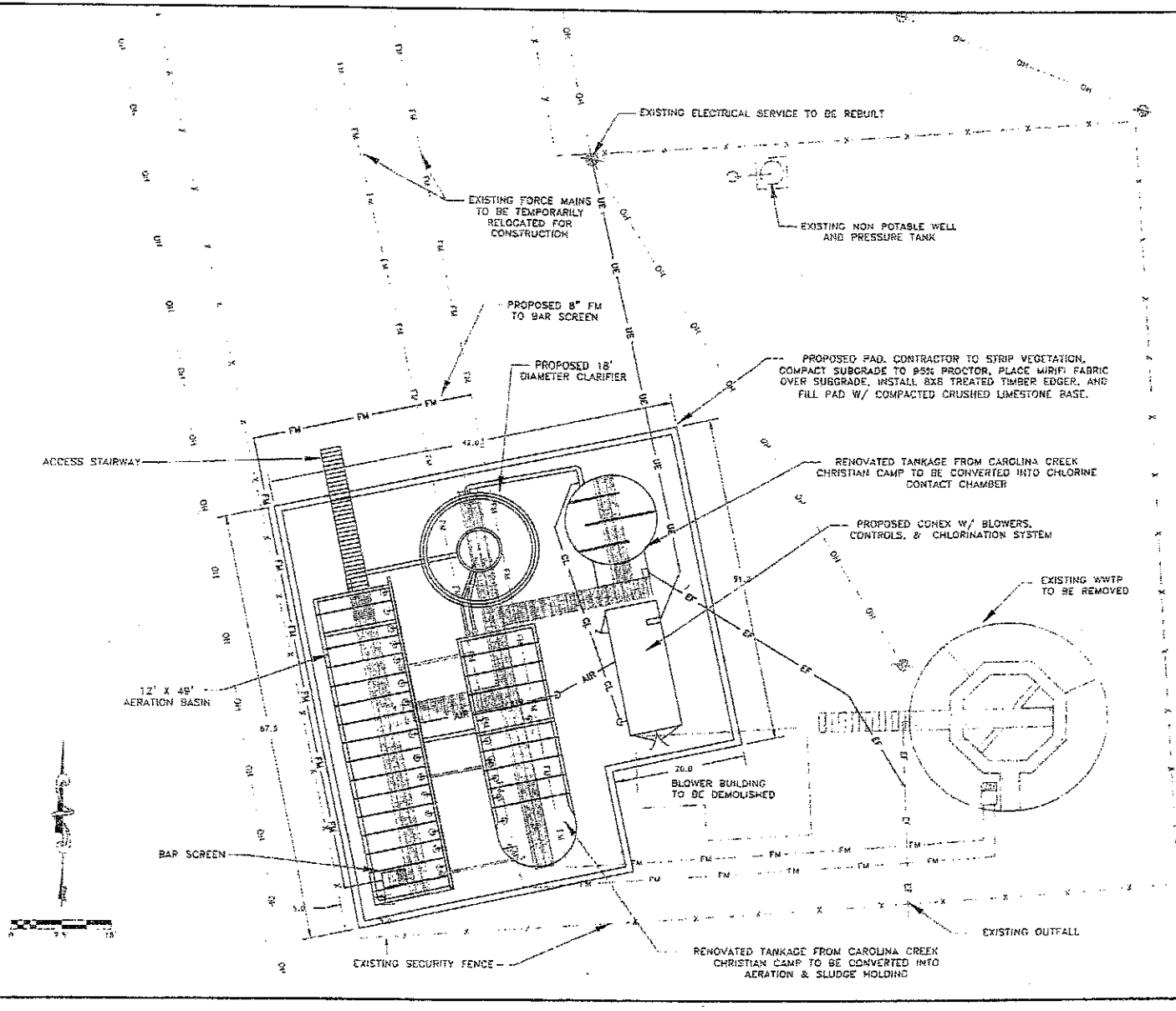
STATE OF TEXAS
LICENSED
PROFESSIONAL ENGINEER
9/16/12

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH: (512) 316-0176
FIRM REGISTRATION NO. F-1234

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
FLOW SCHEMATIC AND HYDRAULIC PROFILE
CHAMBERS COUNTY, TEXAS

DESIGNED BY: ...
DRAWN BY: ...
CHECKED BY: ...
SCALE: ...
DATE: ...

SHEET 3



STATE OF TEXAS
HEARN
LICENSED
PROFESSIONAL ENGINEER

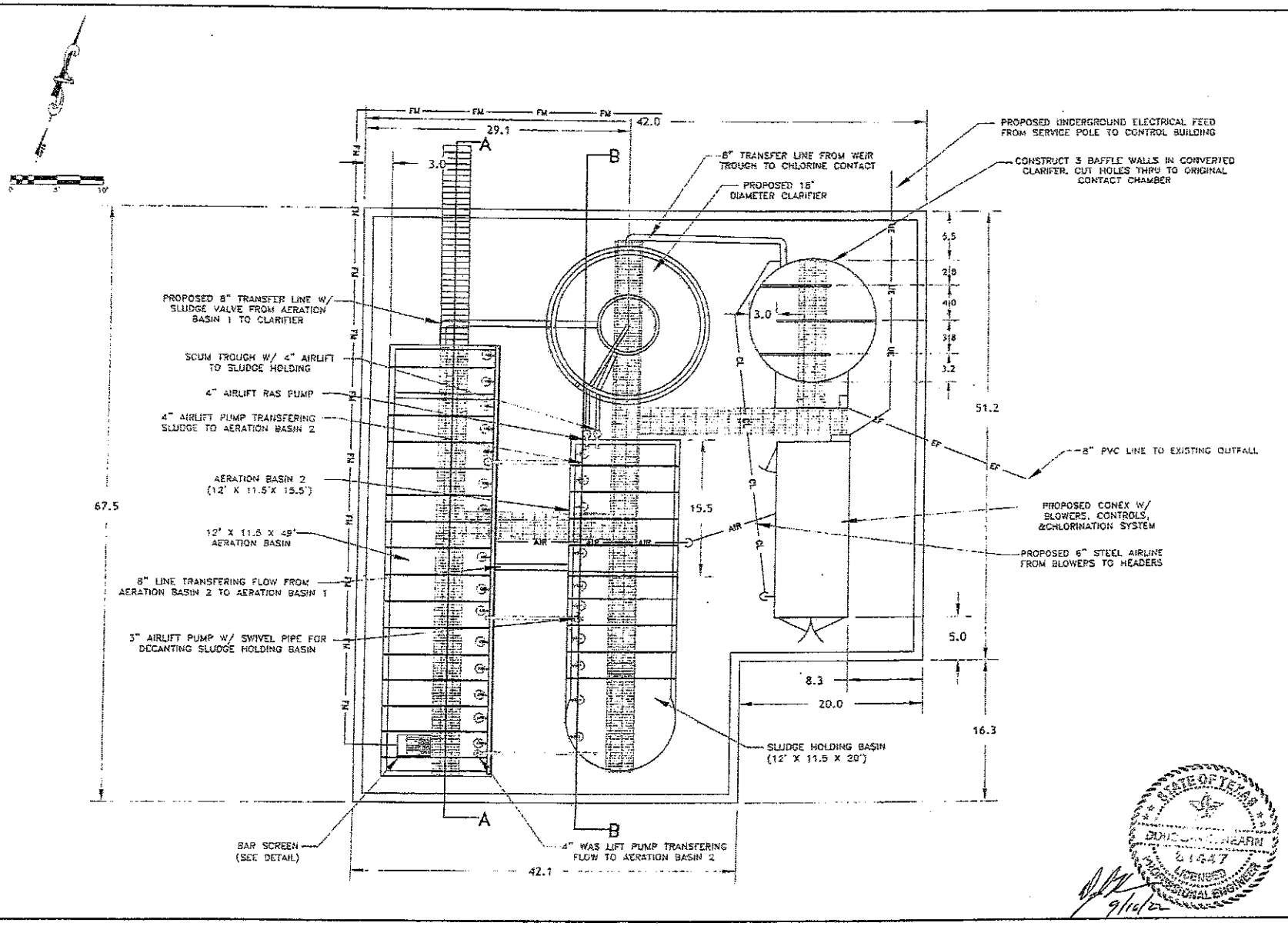
9/16/22

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0171
FIRM REGISTRATION NO. F-1234

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT SITE PLAN
CHAMBERS COUNTY, TEXAS

DESIGNED BY: RCH
DRAWN BY: ASR
CHECKED BY: RCH
SCALE: 1" = 10'
DATE: 9/2022

SHEET
4



HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

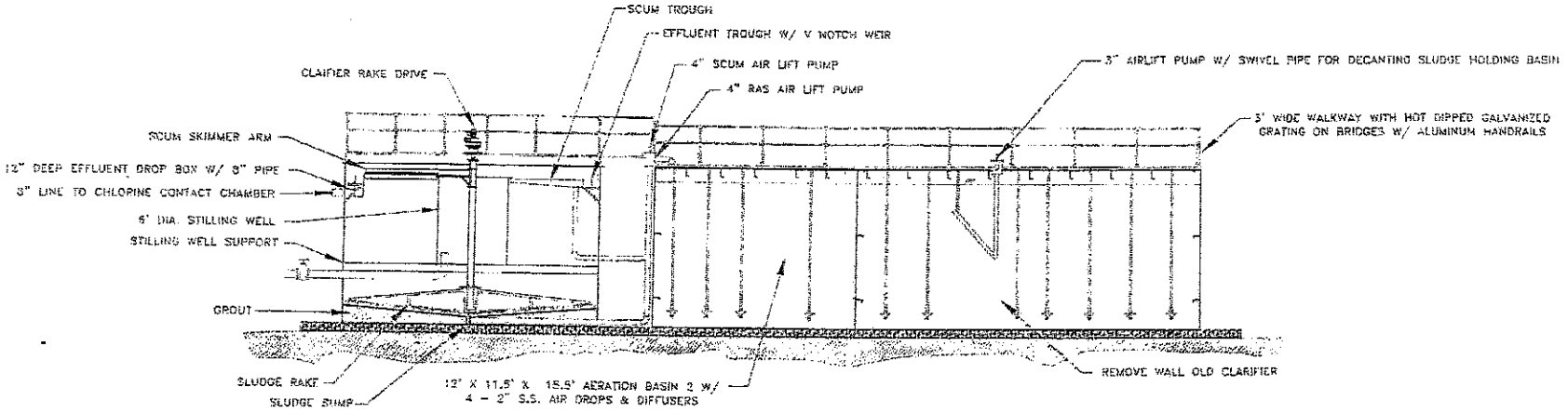
UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT LAYOUT
CHAMBERS COUNTY, TEXAS

DESIGNED BY: DGH
DRAWN BY: AGL
CHECKED BY: DGH
SCALE: 1" = 10'
DATE: 9/2022

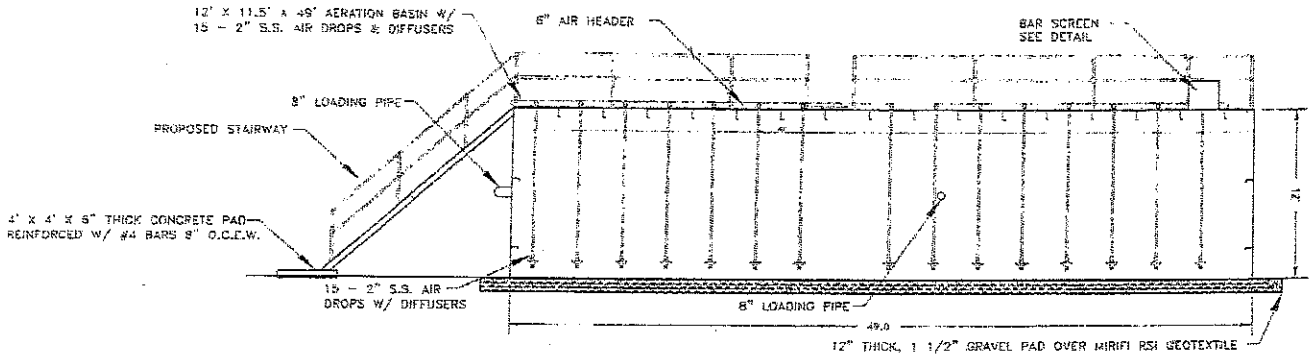
NO. REVISIONS DATE

STATE OF TEXAS
DUNCAN GARRY HEARN
21447
LICENSED PROFESSIONAL ENGINEER
9/16/22

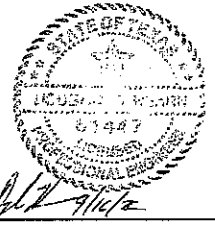
SHEET 5



SECTION A - A

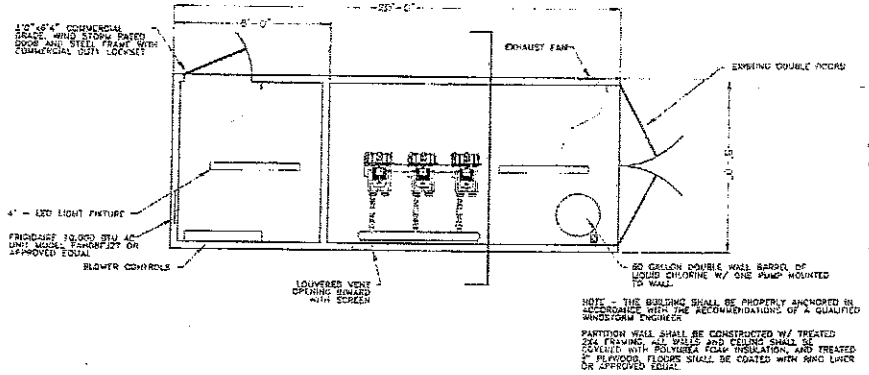


SECTION B - B

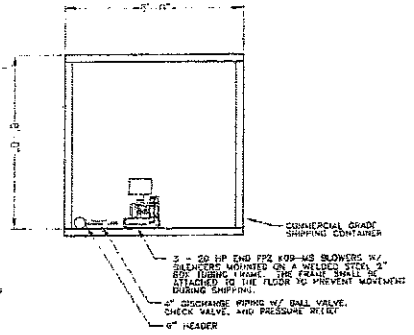


9/16/12

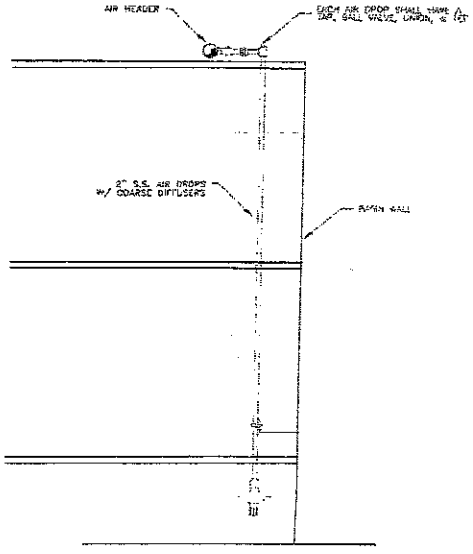
PROJECT	UNDINE, L.L.C. BOLIVAR WASTEWATER SYSTEM CRYSTAL BEACH WASTEWATER PLANT SECTIONS GALVESTON COUNTY, TEXAS
ENGINEER	HEARN ENGINEERING INC. P.O. BOX 1134 CAMERON, TEXAS 76520 PH (512) 310-0170 FIRM REGISTRATION NO. F-1234
SHEET	6



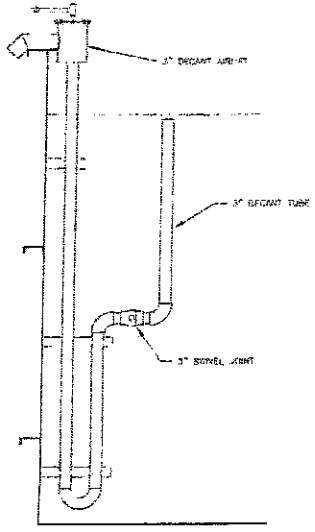
20' SHIPPING CONTAINER PLAN VIEW



SECTION VIEW



AIR DROP
SCALE 1"=5'



DECANT PIPING
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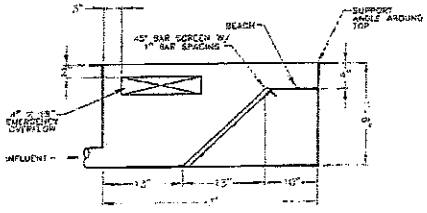
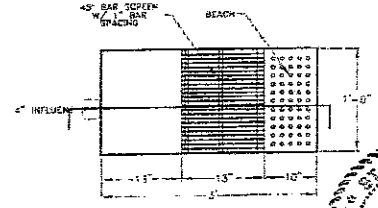
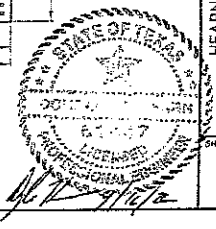


SECTION VIEW



PLAN VIEW

BAR SCREEN
NOT TO SCALE



NO.	REVISIONS	DATE
1		
2		

DESIGNED BY: MCH
DRAWN BY: ACH
CHECKED BY: GBH
SCALES: --- HTS.
DATE: 3/2022

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

SHEET 7

ELECTRICAL NOTES:

1. UNDERGROUND CONDUIT MAY BE PVC RIGID CONDUIT WITH 24" MIN. COVER WITH 2" RED CONC. CAP IN LIEU OF RIGID STEEL.

2. EXTERIOR ELECTRICAL ENCL. SHALL BE NEMA-3R OR NEMA 4 WEATHERPROOF.

3. WIRING AND CONDUIT SHOWN FOR GENERAL ARRANGEMENT ONLY. CONTRACTOR SHALL INSTALL ALL CONTROL PANELS, WIRING, AND CONDUIT REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING INSTALLATION IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND THE INTENT OF THE SPECS.

4. ALL CONDUCTORS SHALL BE COPPER. CONDUIT INSIDE PUMP BUILDINGS MAY BE SURFACE MOUNTED ENCL. ALL ELECTRICAL WITHIN CHEMICAL ROOMS SHALL BE PVC SEALED TO PREVENT CORROSION FROM GAS. SEAL WYES SHALL BE INSTALLED ON ALL CONDUIT RUNS LEAVING A CHEMICAL ROOM.

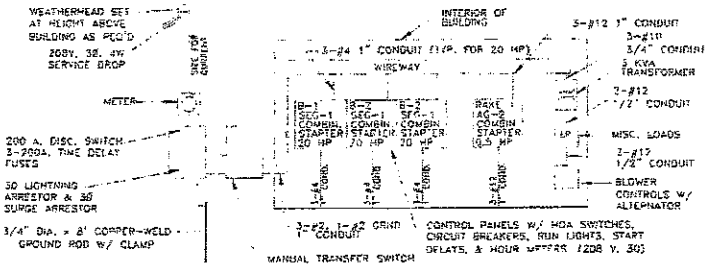
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS AND COORDINATE THE INSTALLATION OF THE ELECTRICAL AND TELEPHONE SERVICE TO SITE. COST OF ESTABLISHING SERVICE SHALL BE INCLUDED IN THE BID. THE TELEPHONE NUMBER SHALL BE PLACED INSIDE THE ALARM DIALER.

6. ALL CONTROL PANELS SHALL BE LABELED WITH PERMANENT, PLASTIC NAME PLATES.

7. ALL MOTORS SHALL BE PROVIDED WITH ADJUSTABLE TIME DELAYS AND PHASE MONITORS.

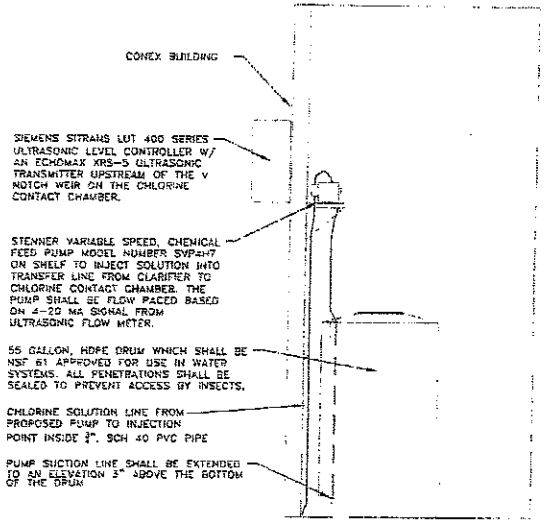
8. ALL WIRING, ELECTRICAL EQUIPMENT, CONTROLS, AND MOTORS SHALL BE PROTECTED FROM SURGES WITH EQUIPMENT DESIGNED FOR THIS APPLICATION.

9. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT THE CONTRACTOR SHALL PROVIDE AN INSTALLATION THAT IS COMPLETE AND FUNCTIONAL. ALL ITEMS NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, SHALL BE PROVIDED.



ELECTRICAL DISTRIBUTION

NOT TO SCALE



LIQUID CHEMICAL FEED

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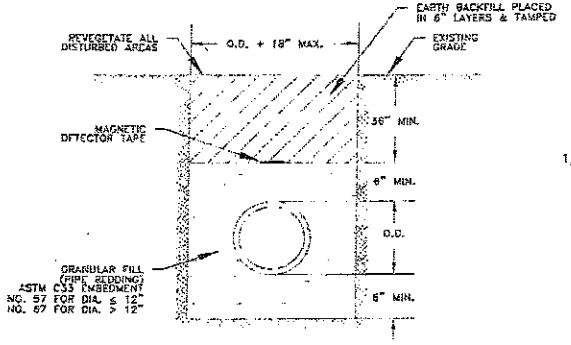

PIPE BEDDING

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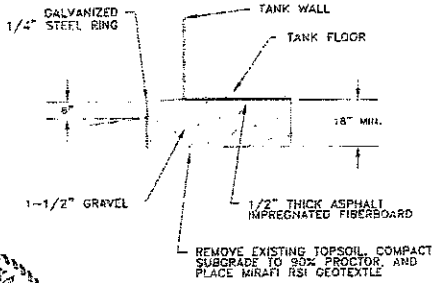


FOUNDATION DETAIL

NOT TO SCALE

STATE OF TEXAS
DOUGLAS S. HEARN
61447
LICENSED
PROFESSIONAL ENGINEER
9/16/12

NO	REVISIONS
	DATE
DESIGNED BY: DSH	
DRAWN BY: ACH	
CHECKED BY: DSH	
SCALE: NTS	
DATE: 6/2012	

UNDINE, L.L.C.
BAINBRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

SHEET 8

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

DOMESTIC WASTEWATER PERMIT APPLICATION TECHNICAL REPORT 1.0

For any questions about this form, please contact the Domestic Wastewater Permitting Team at 512-239-4671.

The following information is required for all renewal, new, and amendment applications.

Section 1. Permitted or Proposed Flows (Instructions Page 43)

A. Existing/Interim I Phase

Design Flow (MGD): Click to enter text.

2-Hr Peak Flow (MGD): Click to enter text.

Estimated construction start date: Click to enter text.

Estimated waste disposal start date: Click to enter text.

B. Interim II Phase

Design Flow (MGD): Click to enter text.

2-Hr Peak Flow (MGD): Click to enter text.

Estimated construction start date: Click to enter text.

Estimated waste disposal start date: Click to enter text.

C. Final Phase

Design Flow (MGD): 0.1

2-Hr Peak Flow (MGD): 0.212

Estimated construction start date: Click to enter text.

Estimated waste disposal start date: Click to enter text.

D. Current Operating Phase

Provide the startup date of the facility: 4/1/71

Section 2. Treatment Process (Instructions Page 43)

A. Current Operating Phase

Provide a detailed description of the treatment process. **Include the type of treatment plant, mode of operation, and all treatment units.** Start with the plant's head works and

finish with the point of discharge. Include all sludge processing and drying units. **If more than one phase exists or is proposed, a description of *each phase* must be provided.**

See Attachment T-1

B. Treatment Units

In Table 1.0(1), provide the treatment unit type, the number of units, and dimensions (length, width, depth) **of each treatment unit, accounting for *all* phases of operation.**

Table 1.0(1) - Treatment Units

Treatment Unit Type	Number of Units	Dimensions (L x W x D)
See Attachment T-1		

C. Process Flow Diagram

Provide flow diagrams for the existing facilities and **each** proposed phase of construction.

Attachment: T-1

Section 3. Site Information and Drawing (Instructions Page 44)

Provide the TPDES discharge outfall latitude and longitude. Enter N/A if not applicable.

- Latitude: 29.6591111
- Longitude: -94.8969444

Provide the TLAP disposal site latitude and longitude. Enter N/A if not applicable.

- Latitude: NA
- Longitude: NA

Provide a site drawing for the facility that shows the following:

- The boundaries of the treatment facility;
- The boundaries of the area served by the treatment facility;
- If land disposal of effluent, the boundaries of the disposal site and all storage/holding ponds; and
- If sludge disposal is authorized in the permit, the boundaries of the land application or disposal site.

Attachment: T-2

Provide the name **and** a description of the area served by the treatment facility.

Bayridge Subdivision and Oaks at Houston Point

Collection System Information **for wastewater TPDES permits only:** Provide information for each **uniquely owned** collection system, existing and new, served by this facility, including satellite collection systems. **Please see the instructions for a detailed explanation and examples.**

Collection System Information

Collection System Name	Owner Name	Owner Type	Population Served
Bayridge	Undine	Privately Owned	
Oaks at Houston Point	Undine	Privately Owned	
		Choose an item.	
		Choose an item.	

Section 4. Unbuilt Phases (Instructions Page 45)

Is the application for a renewal of a permit that contains an unbuilt phase or phases?

☐ Yes ☒ No

If yes, does the existing permit contain a phase that has not been constructed **within five years** of being authorized by the TCEQ?

☐ Yes ☒ No

If yes, provide a detailed discussion regarding the continued need for the unbuilt phase. **Failure to provide sufficient justification may result in the Executive Director recommending denial of the unbuilt phase or phases.**

Click to enter text.

Section 5. Closure Plans (Instructions Page 45)

Have any treatment units been taken out of service permanently, or will any units be taken out of service in the next five years?

☐ Yes ☒ No

If yes, was a closure plan submitted to the TCEQ?

☐ Yes ☒ No

If yes, provide a brief description of the closure and the date of plan approval.

Click to enter text.

Section 6. Permit Specific Requirements (Instructions Page 45)

For applicants with an existing permit, check the Other Requirements or Special Provisions of the permit.

A. Summary transmittal

Have plans and specifications been approved for the existing facilities and each proposed phase?

☒ Yes ☐ No

If yes, provide the date(s) of approval for each phase: 4/1/71

Provide information, including dates, on any actions taken to meet a *requirement or provision* pertaining to the submission of a summary transmittal letter. **Provide a copy of an approval letter from the TCEQ, if applicable.**

Click to enter text.

B. Buffer zones

Have the buffer zone requirements been met?

☒ Yes ☐ No

Provide information below, including dates, on any actions taken to meet the conditions of the buffer zone. If available, provide any new documentation relevant to maintaining the buffer zones.

Click to enter text.

C. Other actions required by the current permit

Does the *Other Requirements* or *Special Provisions* section in the existing permit require submission of any other information or other required actions? Examples include Notification of Completion, progress reports, soil monitoring data, etc.

☐ Yes ☒ No

If yes, provide information below on the status of any actions taken to meet the conditions of an *Other Requirement* or *Special Provision.*

Click to enter text.

D. Grit and grease treatment

1. Acceptance of grit and grease waste

Does the facility have a grit and/or grease processing facility onsite that treats and decants or accepts transported loads of grit and grease waste that are discharged directly to the wastewater treatment plant prior to any treatment?

☐ Yes ☒ No

If No, stop here and continue with Subsection E. Stormwater Management.

2. Grit and grease processing

Describe below how the grit and grease waste is treated at the facility. In your description, include how and where the grit and grease is introduced to the treatment works and how it is separated or processed. Provide a flow diagram showing how grit and grease is processed at the facility.

Click to enter text.

3. Grit disposal

Does the facility have a Municipal Solid Waste (MSW) registration or permit for grit disposal?

☐ Yes ☒ No

If No, contact the TCEQ Municipal Solid Waste team at 512-239-2335. Note: A registration or permit is required for grit disposal. Grit shall not be combined with treatment plant sludge. See the instruction booklet for additional information on grit disposal requirements and restrictions.

Describe the method of grit disposal.

Click to enter text.

4. ***Grease and decanted liquid disposal***

Note: A registration or permit is required for grease disposal. Grease shall not be combined with treatment plant sludge. For more information, contact the TCEQ Municipal Solid Waste team at 512-239-2335.

Describe how the decant and grease are treated and disposed of after grit separation.

Click to enter text.

E. Stormwater management

1. ***Applicability***

Does the facility have a design flow of 1.0 MGD or greater in any phase?

☐ Yes ☒ No

Does the facility have an approved pretreatment program, under 40 CFR Part 403?

☐ Yes ☒ No

If no to both of the above, then skip to Subsection F, Other Wastes Received.

2. ***MSGP coverage***

Is the stormwater runoff from the WWTP and dedicated lands for sewage disposal currently permitted under the TPDES Multi-Sector General Permit (MSGP), TXR050000?

☐ Yes ☒ No

If yes, please provide MSGP Authorization Number and skip to Subsection F, Other Wastes Received:

TXR05 Click to enter text. or TXRNE Click to enter text.

If no, do you intend to seek coverage under TXR050000?

☐ Yes ☒ No

3. ***Conditional exclusion***

Alternatively, do you intend to apply for a conditional exclusion from permitting based TXR050000 (Multi Sector General Permit) Part II B.2 or TXR050000 (Multi Sector General Permit) Part V, Sector T 3(b)?

☐ Yes ☒ No

If yes, please explain below then proceed to Subsection F, Other Wastes Received:

Click to enter text.

4. ***Existing coverage in individual permit***

Is your stormwater discharge currently permitted through this individual TPDES or TLAP permit?

☐ Yes ☒ No

If yes, provide a description of stormwater runoff management practices at the site that are authorized in the wastewater permit then skip to Subsection F, Other Wastes Received.

Click to enter text.

5. ***Zero stormwater discharge***

Do you intend to have no discharge of stormwater via use of evaporation or other means?

☐ Yes ☒ No

If yes, explain below then skip to Subsection F. Other Wastes Received.

Click to enter text.

Note: If there is a potential to discharge any stormwater to surface water in the state as the result of any storm event, then permit coverage is required under the MSGP or an individual discharge permit. This requirement applies to all areas of facilities with treatment plants or systems that treat, store, recycle, or reclaim domestic sewage, wastewater or sewage sludge (including dedicated lands for sewage sludge disposal located within the onsite property boundaries) that meet the applicability criteria of above. You have the option of obtaining coverage under the MSGP for direct discharges, (recommended), or obtaining coverage under this individual permit.

6. ***Request for coverage in individual permit***

Are you requesting coverage of stormwater discharges associated with your treatment plant under this individual permit?

☐ Yes ☒ No

If yes, provide a description of stormwater runoff management practices at the site for which you are requesting authorization in this individual wastewater permit and describe whether you intend to comingle this discharge with your treated effluent or discharge it via a separate dedicated stormwater outfall. Please also indicate if you

intend to divert stormwater to the treatment plant headworks and indirectly discharge it to water in the state.

Click to enter text.

Note: Direct stormwater discharges to waters in the state authorized through this individual permit will require the development and implementation of a stormwater pollution prevention plan (SWPPP) and will be subject to additional monitoring and reporting requirements. Indirect discharges of stormwater via headworks recycling will require compliance with all individual permit requirements including 2-hour peak flow limitations. All stormwater discharge authorization requests will require additional information during the technical review of your application.

F. Discharges to the Lake Houston Watershed

Does the facility discharge in the Lake Houston watershed?

☐ Yes ☒ No

If yes, attach a Sewage Sludge Solids Management Plan. See Example 5 in the instructions.
Click to enter text.

G. Other wastes received including sludge from other WWTPs and septic waste

1. *Acceptance of sludge from other WWTPs*

Does or will the facility accept sludge from other treatment plants at the facility site?

☐ Yes ☒ No

If yes, attach sewage sludge solids management plan. See Example 5 of instructions.

In addition, provide the date the plant started or is anticipated to start accepting sludge, an estimate of monthly sludge acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the sludge, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

2. *Acceptance of septic waste*

Is the facility accepting or will it accept septic waste?

☐ Yes ☒ No

If yes, does the facility have a Type V processing unit?

☐ Yes ☒ No

If yes, does the unit have a Municipal Solid Waste permit?

☐ Yes ☒ No

If yes to any of the above, provide the date the plant started or is anticipated to start accepting septic waste, an estimate of monthly septic waste acceptance (gallons or millions of gallons), an estimate of the BOD_5 concentration of the septic waste, and the design BOD_5 concentration of the influent from the collection system. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Note: Permits that accept sludge from other wastewater treatment plants may be required to have influent flow and organic loading monitoring.

3. ***Acceptance of other wastes (not including septic, grease, grit, or RCRA, CERCLA or as discharged by IUs listed in Worksheet 6)***

Is or will the facility accept wastes that are not domestic in nature excluding the categories listed above?

☐ Yes ☒ No

If yes, provide the date that the plant started accepting the waste, an estimate how much waste is accepted on a monthly basis (gallons or millions of gallons), a description of the entities generating the waste, and any distinguishing chemical or other physical characteristic of the waste. Also note if this information has or has not changed since the last permit action.

Click to enter text.

Section 7. Pollutant Analysis of Treated Effluent (Instructions Page 50)

Is the facility in operation?

☒ Yes ☐ No

If no, this section is not applicable. Proceed to Section 8.

If yes, provide effluent analysis data for the listed pollutants. ***Wastewater treatment facilities*** complete Table 1.0(2). ***Water treatment facilities*** discharging filter backwash water, complete Table 1.0(3). Provide copies of the laboratory results sheets. **These tables are not applicable for a minor amendment without renewal.** See the instructions for guidance.

Note: The sample date must be within 1 year of application submission.

Table1.0(2) – Pollutant Analysis for Wastewater Treatment Facilities

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
$CBOD_5$, mg/l	Pending				
Total Suspended Solids, mg/l					
Ammonia Nitrogen, mg/l					
Nitrate Nitrogen, mg/l					
Total Kjeldahl Nitrogen, mg/l					
Sulfate, mg/l					
Chloride, mg/l					
Total Phosphorus, mg/l					
pH, standard units					
Dissolved Oxygen*, mg/l					
Chlorine Residual, mg/l					
E.coli (CFU/100ml) freshwater					
Entercocci (CFU/100ml) saltwater					
Total Dissolved Solids, mg/l					
Electrical Conductivity, µmohs/cm, †					
Oil & Grease, mg/l					
Alkalinity ($CaCO_3$)*, mg/l					

*TPDES permits only
†TLAP permits only

Table1.0(3) – Pollutant Analysis for Water Treatment Facilities

Pollutant	Average Conc.	Max Conc.	No. of Samples	Sample Type	Sample Date/Time
Total Suspended Solids, mg/l					
Total Dissolved Solids, mg/l					
pH, standard units					
Fluoride, mg/l					
Aluminum, mg/l					
Alkalinity ($CaCO_3$), mg/l					

Section 8. Facility Operator (Instructions Page 50)

Facility Operator Name: H2O INNOVATION OPERATION & MAINTENANCE LLC

Facility Operator's License Classification and Level: OC0000271

Facility Operator's License Number: OC0000271

Section 9. Sludge and Biosolids Management and Disposal (Instructions Page 51)

A. WWTP's Biosolids Management Facility Type

Check all that apply. See instructions for guidance

- ☐ Design flow>= 1 MGD
- ☐ Serves >= 10,000 people
- ☒ Class I Sludge Management Facility (per 40 CFR § 503.9)
- ☐ Biosolids generator
- ☐ Biosolids end user - land application (onsite)
- ☒ Biosolids end user - surface disposal (onsite)
- ☒ Biosolids end user - incinerator (onsite)

B. WWTP's Biosolids Treatment Process

Check all that apply. See instructions for guidance.

- ☒ Aerobic Digestion
- ☐ Air Drying (or sludge drying beds)
- ☐ Lower Temperature Composting
- ☐ Lime Stabilization
- ☐ Higher Temperature Composting
- ☐ Heat Drying
- ☐ Thermophilic Aerobic Digestion
- ☐ Beta Ray Irradiation
- ☐ Gamma Ray Irradiation
- ☐ Pasteurization
- ☐ Preliminary Operation (e.g. grinding, de-gritting, blending)
- ☐ Thickening (e.g. gravity thickening, centrifugation, filter press, vacuum filter)
- ☐ Sludge Lagoon
- ☐ Temporary Storage (< 2 years)
- ☐ Long Term Storage (>= 2 years)
- ☐ Methane or Biogas Recovery
- ☐ Other Treatment Process: Click to enter text.

C. Biosolids Management

Provide information on the *intended* biosolids management practice. Do not enter every management practice that you want authorized in the permit, as the permit will authorize

all biosolids management practices listed in the instructions. Rather indicate the management practice the facility plans to use.

Biosolids Management

Management Practice	Handler or Preparer Type	Bulk or Bag Container	Amount (dry metric tons)	Pathogen Reduction Options	Vector Attraction Reduction Option
Agricultural Land Application	Off-site Third-Party Handler or Preparer	Bulk		Choose an item.	Choose an item.
Choose an item.	Choose an item.	Choose an item.		Choose an item.	Choose an item.
Choose an item.	Choose an item.	Choose an item.		Choose an item.	Choose an item.

If "Other" is selected for Management Practice, please explain (e.g. monofill or transport to another WWTP): Click to enter text.

D. Disposal site

Disposal site name: Click to enter text.

TCEQ permit or registration number: Click to enter text.

County where disposal site is located: Click to enter text.

E. Transportation method

Method of transportation (truck, train, pipe, other): Pending

Name of the hauler: Pending

Hauler registration number: Pending

Sludge is transported as a:

Liquid ☐ semi-liquid ☒ semi-solid ☐ solid ☐

Section 10. Permit Authorization for Sewage Sludge Disposal (Instructions Page 53)

A. Beneficial use authorization

Does the existing permit include authorization for land application of sewage sludge for beneficial use?

☐ Yes ☒ No

If yes, are you requesting to continue this authorization to land apply sewage sludge for beneficial use?

☐ Yes ☒ No

If yes, is the completed **Application for Permit for Beneficial Land Use of Sewage Sludge (TCEQ Form No. 10451)** attached to this permit application (see the instructions for details)?

☐ Yes ☒ No

B. Sludge processing authorization

Does the existing permit include authorization for any of the following sludge processing, storage or disposal options?

Sludge Composting	☐ Yes	☒ No
Marketing and Distribution of sludge	☐ Yes	☒ No
Sludge Surface Disposal or Sludge Monofill	☐ Yes	☒ No
Temporary storage in sludge lagoons	☐ Yes	☒ No

If yes to any of the above sludge options and the applicant is requesting to continue this authorization, is the completed **Domestic Wastewater Permit Application: Sewage Sludge Technical Report (TCEQ Form No. 10056)** attached to this permit application?

☐ Yes ☒ No

Section 11. Sewage Sludge Lagoons (Instructions Page 53)

Does this facility include sewage sludge lagoons?

☐ Yes ☒ No

If yes, complete the remainder of this section. If no, proceed to Section 12.

A. Location information

The following maps are required to be submitted as part of the application. For each map, provide the Attachment Number.

- Original General Highway (County) Map:

  Attachment: Click to enter text.
- USDA Natural Resources Conservation Service Soil Map:

  Attachment: Click to enter text.
- Federal Emergency Management Map:

  Attachment: Click to enter text.
- Site map:

  Attachment: Click to enter text.

Discuss in a description if any of the following exist within the lagoon area. Check all that apply.

☐ Overlap a designated 100-year frequency flood plain

☐ Soils with flooding classification

☐ Overlap an unstable area

☐ Wetlands

☐ Located less than 60 meters from a fault

☒ None of the above

Attachment: Click to enter text.

If a portion of the lagoon(s) is located within the 100-year frequency flood plain, provide the protective measures to be utilized including type and size of protective structures:

Click to enter text.

B. Temporary storage information

Provide the results for the pollutant screening of sludge lagoons. These results are in addition to pollutant results in *Section 7 of Technical Report 1.0.*

Nitrate Nitrogen, mg/kg: Click to enter text.

Total Kjeldahl Nitrogen, mg/kg: Click to enter text.

Total Nitrogen (=nitrate nitrogen + TKN), mg/kg: Click to enter text.

Phosphorus, mg/kg: Click to enter text.

Potassium, mg/kg: Click to enter text.

pH, standard units: Click to enter text.

Ammonia Nitrogen mg/kg: Click to enter text.

Arsenic: Click to enter text.

Cadmium: Click to enter text.

Chromium: Click to enter text.

Copper: Click to enter text.

Lead: Click to enter text.

Mercury: Click to enter text.

Molybdenum: Click to enter text.

Nickel: Click to enter text.

Selenium: Click to enter text.

Zinc: Click to enter text.

Total PCBs: Click to enter text.

Provide the following information:

Volume and frequency of sludge to the lagoon(s): Click to enter text.

Total dry tons stored in the lagoons(s) per 365-day period: Click to enter text.

Total dry tons stored in the lagoons(s) over the life of the unit: Click to enter text.

C. Liner information

Does the active/proposed sludge lagoon(s) have a liner with a maximum hydraulic conductivity of $1x10^{-7}$ cm/sec?

☐ Yes ☒ No

If yes, describe the liner below. Please note that a liner is required.

Click to enter text.

D. Site development plan

Provide a detailed description of the methods used to deposit sludge in the lagoon(s):

Click to enter text.

Attach the following documents to the application.

- Plan view and cross-section of the sludge lagoon(s)

  Attachment: Click to enter text.
- Copy of the closure plan

  Attachment: Click to enter text.
- Copy of deed recordation for the site

  Attachment: Click to enter text.
- Size of the sludge lagoon(s) in surface acres and capacity in cubic feet and gallons

  Attachment: Click to enter text.
- Description of the method of controlling infiltration of groundwater and surface water from entering the site

  Attachment: Click to enter text.
- Procedures to prevent the occurrence of nuisance conditions

  Attachment: Click to enter text.

E. Groundwater monitoring

Is groundwater monitoring currently conducted at this site, or are any wells available for groundwater monitoring, or are groundwater monitoring data otherwise available for the sludge lagoon(s)?

☐ Yes ☐ No

If groundwater monitoring data are available, provide a copy. Provide a profile of soil types encountered down to the groundwater table and the depth to the shallowest groundwater as a separate attachment.

Attachment: Click to enter text.

Section 12. Authorizations/Compliance/Enforcement (Instructions Page 55)

A. Additional authorizations

Does the permittee have additional authorizations for this facility, such as reuse authorization, sludge permit, etc?

☐ Yes ☒ No

If yes, provide the TCEQ authorization number and description of the authorization:

The Applicant will submit a 210 Authorization in the future

B. Permittee enforcement status

Is the permittee currently under enforcement for this facility?

☐ Yes ☒ No

Is the permittee required to meet an implementation schedule for compliance or enforcement?

☐ Yes ☒ No

If yes to either question, provide a brief summary of the enforcement, the implementation schedule, and the current status:

Click to enter text.

Section 13. RCRA/CERCLA Wastes (Instructions Page 55)

A. RCRA hazardous wastes

Has the facility received in the past three years, does it currently receive, or will it receive RCRA hazardous waste?

☐ Yes ☒ No

B. Remediation activity wastewater

Has the facility received in the past three years, does it currently receive, or will it receive CERCLA wastewater, RCRA remediation/corrective action wastewater or other remediation activity wastewater?

☐ Yes ☒ No

C. Details about wastes received

If yes to either Subsection A or B above, provide detailed information concerning these wastes with the application.

Attachment: Click to enter text.

Section 14. Laboratory Accreditation (Instructions Page 56)

All laboratory tests performed must meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification*, which includes the following general exemptions from National Environmental Laboratory Accreditation Program (NELAP) certification requirements:

- The laboratory is an in-house laboratory and is:
  - periodically inspected by the TCEQ; or
  - located in another state and is accredited or inspected by that state; or
  - performing work for another company with a unit located in the same site; or
  - performing pro bono work for a governmental agency or charitable organization.
- The laboratory is accredited under federal law.
- The data are needed for emergency-response activities, and a laboratory accredited under the Texas Laboratory Accreditation Program is not available.
- The laboratory supplies data for which the TCEQ does not offer accreditation.

The applicant should review 30 TAC Chapter 25 for specific requirements.

The following certification statement shall be signed and submitted with every application. See the Signature Page section in the Instructions, for a list of designated representatives who may sign the certification.

CERTIFICATION:

I certify that all laboratory tests submitted with this application meet the requirements of *30 TAC Chapter 25, Environmental Testing Laboratory Accreditation and Certification.*

Printed Name: Pending Results

Title: Click to enter text.

Signature: _____

Date: _____

DOMESTIC WASTEWATER PERMIT APPLICATION WORKSHEET 2.0: RECEIVING WATERS

The following information is required for all TPDES permit applications.

Section 1. Domestic Drinking Water Supply (Instructions Page 64)

Is there a surface water intake for domestic drinking water supply located within 5 miles downstream from the point or proposed point of discharge?

☐ Yes ☒ No

If **no**, proceed it Section 2. **If yes**, provide the following:

Owner of the drinking water supply: Click to enter text.

Distance and direction to the intake: Click to enter text.

Attach a USGS map that identifies the location of the intake.

Attachment: Click to enter text.

Section 2. Discharge into Tidally Affected Waters (Instructions Page 64)

Does the facility discharge into tidally affected waters?

☒ Yes ☐ No

If **no**, proceed to Section 3. **If yes**, complete the remainder of this section. If no, proceed to Section 3.

A. Receiving water outfall

Width of the receiving water at the outfall, in feet: 52,800

B. Oyster waters

Are there oyster waters in the vicinity of the discharge?

☒ Yes ☐ No

If yes, provide the distance and direction from outfall(s).

>1Mile South of outfall

C. Sea grasses

Are there any sea grasses within the vicinity of the point of discharge?

☐ Yes ☒ No

If yes, provide the distance and direction from the outfall(s).

Unknown

Section 3. Classified Segments (Instructions Page 64)

Is the discharge directly into (or within 300 feet of) a classified segment?

☒ Yes ☐ No

If yes, this Worksheet is complete.

If no, complete Sections 4 and 5 of this Worksheet.

Section 4. Description of Immediate Receiving Waters (Instructions Page 65)

Name of the immediate receiving waters: Click to enter text.

A. Receiving water type

Identify the appropriate description of the receiving waters.

☐ Stream

☐ Freshwater Swamp or Marsh

☐ Lake or Pond

Surface area, in acres: Click to enter text.

Average depth of the entire water body, in feet: Click to enter text.

Average depth of water body within a 500-foot radius of discharge point, in feet: Click to enter text.

☐ Man-made Channel or Ditch

☐ Open Bay

☐ Tidal Stream, Bayou, or Marsh

☐ Other, specify: Click to enter text.

B. Flow characteristics

If a stream, man-made channel or ditch was checked above, provide the following. For existing discharges, check one of the following that best characterizes the area *upstream* of the discharge. For new discharges, characterize the area *downstream* of the discharge (check one).

☐ Intermittent - dry for at least one week during most years

☐ Intermittent with Perennial Pools - enduring pools with sufficient habitat to maintain significant aquatic life uses

☐ Perennial - normally flowing

Check the method used to characterize the area upstream (or downstream for new dischargers).

☐ USGS flow records

☐ Historical observation by adjacent landowners

☐ Personal observation

☐ Other, specify: Click to enter text.

Mail and More Etc
1400 Graham Dr Ste B
TOMBALL, TX 77375
281-351-1700

Shipment----------
FedEx Priority Overnight Envelope
Ship To:
APPLICATION REVIEW & PROCESSING MC-
TCEQ
12100 PARK THIRTY FIVE CIR
BUILDING F ROOM 2101
AUSTIN, TX 78753-1808
Package ID: 343946 42.23
Tracking #: 784875276778
Expected arrival: Wed 10/11 10:30 AM

SUBTOTAL	42.23
TAX	0.00
TOTAL	42.23
TEND Debit	42.23

Total shipments: 1
JEFF GOEBEL: GOEBEL ENVIRONMENTAL
10/10/2023
#299600 04:53 PM
Workstation: 47 - Auxiliary Workstation Left
CCTran# 0bcfe36c-0693-4892-ac76-2f1fa8dc736c

Signature_____

****
Thank you for shipping with us.
We greatly appreciate your business.
-Gloria
****

MMISSION ON ENVIRONMENTAL QUALITY

WASTEWATER PERMIT APPLICATION CHECKLIST

this checklist with the application.

mental, LLC

ems is included in your application.

N		Y	N
☐	Original USGS Map	☒	☐
☐	Affected Landowners Map	☒	☐
☐	Landowner Disk or Labels	☒	☐
☐	Buffer Zone Map	☒	☐
☐	Flow Diagram	☒	☐
☐	Site Drawing	☒	☐
☐	Original Photographs	☒	☐
☒	Design Calculations	☒	☐
☒	Solids Management Plan	☒	☐
☒	Water Balance	☐	☒
☒			
☒			
☒			
☒			
☒			
☒			

For TCEQ Use Only

Segment Number _____ County _____
Expiration Date _____ Region _____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION FOR A DOMESTIC WASTEWATER PERMIT ADMINISTRATIVE REPORT 1.0

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

Section 1. Application Fees (Instructions Page 29)

Indicate the amount submitted for the application fee (check only one).

Flow	New/Major Amendment	Renewal
<0.05 MGD	$350.00 ☐	$315.00 ☐
≥0.05 but <0.10 MGD	$550.00 ☐	$515.00 ☐
≥0.10 but <0.25 MGD	$850.00 ☐	$815.00 ☒
≥0.25 but <0.50 MGD	$1,250.00 ☐	$1,215.00 ☐
≥0.50 but <1.0 MGD	$1,650.00 ☐	$1,615.00 ☐
≥1.0 MGD	$2,050.00 ☐	$2,015.00 ☐

Minor Amendment (for any flow) $150.00 ☐

Payment Information:

Mailed — Check/Money Order Number: [redacted]

Check/Money Order Amount: [redacted]

Name Printed on Check: [redacted]

EPAY — Voucher Number: [redacted]

Copy of Payment Voucher enclosed? Yes ☒

Section 2. Type of Application (Instructions Page 29)

☐ New TPDES

☒ Major Amendment *with* Renewal

☐ Major Amendment *without* Renewal

☐ Renewal without changes

☐ New TLAP

☐ Minor Amendment *with* Renewal

☐ Minor Amendment *without* Renewal

☐ Minor Modification of permit

For amendments or modifications, describe the proposed changes: Need for additional flow

For existing permits:

Permit Number: WQ0014452001

EPA I.D. (TPDES only): TX0125776

Expiration Date: 7/12/23

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 29)

A. The owner of the facility must apply for the permit.

What is the Legal Name of the entity (applicant) applying for this permit?

Undine Texas Environmental, LLC

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 604519330

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44.*

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Vance Tillman

Credential (P.E, P.G., Ph.D., etc.):

Title: CFO

B. Co-applicant information. Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

None

(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN:

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44.*

Prefix (Mr., Ms., Miss):

First and Last Name:

Credential (P.E, P.G., Ph.D., etc.):

Title:

Provide a brief description of the need for a co-permittee:

C. Core Data Form

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of Administrative Report 1.0.

Attachment: A-1

Section 4. Application Contact Information (Instructions Page 30)

This is the person(s) TCEQ will contact if additional information is needed about this application. Provide a contact for administrative questions and technical questions.

A. Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: 3005 Fax No.:

E-mail Address: jgoebel@undinellc.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

B. Prefix (Mr., Ms., Miss):

First and Last Name:

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name:

Mailing Address:

City, State, Zip Code:

Phone No.: Ext.: Fax No.:

E-mail Address:

Check one or both: ☐ Administrative Contact ☐ Technical Contact

Section 5. Permit Contact Information (Instructions Page 30)

Provide two names of individuals that can be contacted throughout the permit term.

A. Prefix (Mr., Ms., Miss): Ms

First and Last Name: Carey Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: cthomas@undinellc.com

B. Prefix (Mr., Ms., Miss): Mr

First and Last Name: Andy Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Dr

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: athomas@undinellc.com

Section 6. Billing Information (Instructions Page 30)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to permits ***in effect on September 1 of each year.*** The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (using form TCEQ-20029).

Prefix (Mr., Ms., Miss): Ms

First and Last Name: Carey Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: cthomas@undinellc.com

Section 7. DMR/MER Contact Information (Instructions Page 31)

Provide the name and complete mailing address of the person delegated to receive and submit Discharge Monitoring Reports (EPA 3320-1) or maintain Monthly Effluent Reports.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Andy Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: athomas@undinellc.com

DMR data is required to be submitted electronically. Create an account at: https://www.tceq.texas.gov/permitting/netdmr/netdmr.html.

Section 8. Public Notice Information (Instructions Page 31)

A. Individual Publishing the Notices

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: jgoebel@undinellc.com

B. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☒ E-mail Address

☐ Fax

☐ Regular Mail

C. Contact person to be listed in the Notices

Prefix (Mr., Ms., Miss): Mr

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Phone No.: 713-574-5953 Ext.:

E-mail: jgoebel@undinellc.com

D. Public Viewing Information

If the facility or outfall is located in more than one county, a public viewing place for each county must be provided.

Public building name: **Sterling Municipal Library**

Location within the building:

Physical Address of Building: 1 Mary Elizabeth Wilbanks Ave

City: Baytown County: Chambers

Contact Name:

Phone No.: 281-427-7331 Ext.:

E. Bilingual Notice Requirements:

This information **is required** for **new, major amendment, and renewal applications.** It is not required for minor amendment or minor modification applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are required.

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

   ☒ Yes ☐ No

   If **no**, publication of an alternative language notice is not required; **skip to** Section 9 below.

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?

   ☒ Yes ☐ No

3. Do the students at these schools attend a bilingual education program at another location?

   ☐ Yes ☒ No

4. Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC §89.1205(g)?

☐ Yes ☒ No

5. If the answer is yes to question 1, 2, 3, or 4, public notices in an alternative language are required. Which language is required by the bilingual program? Spanish

Section 9. Regulated Entity and Permitted Site Information (Instructions Page 33)

A. If the site is currently regulated by TCEQ, provide the Regulated Entity Number (RN) issued to this site. **RN1023422268**

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/ to determine if the site is currently regulated by TCEQ.

B. Name of project or site (the name known by the community where located):

Bayridge WWTP

C. Owner of treatment facility: Undine Texas Environmental, LLC

Ownership of Facility: ☐ Public ☒ Private ☐ Both ☐ Federal

D. Owner of land where treatment facility is or will be:

Prefix (Mr., Ms., Miss): Undine Texas Environmental, LLC``

First and Last Name:

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

E. Owner of effluent disposal site:

Prefix (Mr., Ms., Miss):

First and Last Name:

Mailing Address:

City, State, Zip Code:

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

F. Owner of sewage sludge disposal site (if authorization is requested for sludge disposal on property owned or controlled by the applicant):

Prefix (Mr., Ms., Miss):

First and Last Name:

Mailing Address:

City, State, Zip Code:

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

Section 10. TPDES Discharge Information (Instructions Page 34)

A. Is the wastewater treatment facility location in the existing permit accurate?

☒ Yes ☐ No

If **no, or a new permit application**, please give an accurate description:

B. Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☒ Yes ☐ No

If **no, or a new or amendment permit application**, provide an accurate description of the point of discharge and the discharge route to the nearest classified segment as defined in 30 TAC Chapter 307:

City nearest the outfall(s): Baytown

County in which the outfalls(s) is/are located: Chambers

Outfall Latitude: 29.65911111 Longitude: 94.89694444

C. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☐ Yes ☒ No

If **yes,** indicate by a check mark if:

☐ Authorization granted ☐ Authorization pending

For **new and amendment** applications, provide copies of letters that show proof of contact and the approval letter upon receipt.

Attachment:

D. For all applications involving an average daily discharge of 5 MGD or more, provide the

names of all counties located within 100 statute miles downstream of the point(s) of discharge.

Under 5 MGD

Section 11. TLAP Disposal Information (Instructions Page 36)

A. For TLAPs, is the location of the effluent disposal site in the existing permit accurate?

☐ Yes ☒ No

If **no, or a new or amendment permit application**, provide an accurate description of the disposal site location:

Not a TLAP Application

B. City nearest the disposal site:

C. County in which the disposal site is located:

D. Disposal Site Latitude: Longitude:

E. For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

F. For **TLAPs**, please identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained:

Section 12. Miscellaneous Information (Instructions Page 37)

A. Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

B. If the existing permit contains an onsite sludge disposal authorization, is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ Not Applicable

If No, or if a new onsite sludge disposal authorization is being requested in this permit application, provide an accurate location description of the sewage sludge disposal site.

Click here to enter text.

C. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐ Yes ☒ No

If yes, list each person formerly employed by the TCEQ who represented your company and was paid for service regarding the application:

Click here to enter text.

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following information:

Account number: Amount past due:

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, please provide the following information:

Enforcement order number: Amount past due:

Section 13. Attachments (Instructions Page 38)

Indicate which attachments are included with the Administrative Report. Check all that apply:

☒ Lease agreement or deed recorded easement, if the land where the treatment facility is located or the effluent disposal site are not owned by the applicant or co-applicant.

☒ Original full-size USGS Topographic Map with the following information:

- Applicant's property boundary
- Treatment facility boundary
- Labeled point of discharge for each discharge point (TPDES only)
- Highlighted discharge route for each discharge point (TPDES only)
- Onsite sewage sludge disposal site (if applicable)
- Effluent disposal site boundaries (TLAP only)
- New and future construction (if applicable)
- 1 mile radius information
- 3 miles downstream information (TPDES only)
- All ponds.

☐ Attachment 1 for Individuals as co-applicants

☒ Other Attachments. Please specify: A-2

Section 14. Signature Page (Instructions Page 39)

If co-applicants are necessary, each entity must submit an original, separate signature page.

Permit Number: WQ0013643001

Applicant: Undine Texas Environmental, LLC

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code § 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Carey Thomas

Signatory title: Vice President

Signature: Carey A. Thomas Date: 10.10.2023

(Use blue ink)

Subscribed and Sworn to before me by the said Carey A. Thomas

on this 10th day of October, 20 23.

My commission expires on the 28th day of January, 20 25.

Nicia Rotermund

Notary Public

[SEAL]

NICIA ROTERMUND
Notary Public, State of Texas
Comm. Expires 01-28-2025
Notary ID 129281276

Harris

County, Texas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: ____Renewal ____Major Amendment ____Minor Amendment ____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

_____ Texas Historical Commission _____ U.S. Fish and Wildlife

_____ Texas Parks and Wildlife Department _____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 53)

The SPIF must be completed as a separate document. The TCEQ will mail a copy of the SPIF to each agency as required by the TCEQ agreement with EPA. If any of the items are not completely addressed or further information is needed, you will be contacted to provide the information before the permit is issued. Each item must be completely addressed.

Do not refer to a response of any item in the permit application form. Each attachment must be provided with this form separately from the administrative report of the application. The application will not be declared administratively complete without this form being completed in its entirety including all attachments.

The following applies to all applications:

1. Permittee: Undine Texas Environmental, LLC

   Permit No. WQ00 13643001 EPA ID No. TX 0042081

   Address of the project (or a location description that includes street/highway, city/vicinity, and county):

   1.5 miles southeast of the intersection of FM 2354 and 1405

Provide the name, address, phone and fax number of an individual that can be contacted to answer specific questions about the property.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title: Business Development

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-724-9321 Ext.: Fax No.:

E-mail Address: jgoebel@undinellc.com

2. List the county in which the facility is located: Galveston
3. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

Undine Texas Environmental, LLC

4. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in 30 TAC Chapter 307). If known, please identify the classified segment number.

From the facility thence to Trinity Bay

5. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report).

Provide original photographs of any structures 50 years or older on the property.

Does your project involve any of the following? Check all that apply.

- ☒ Proposed access roads, utility lines, construction easements
- ☐ Visual effects that could damage or detract from a historic property's integrity
- ☐ Vibration effects during construction or as a result of project design
- ☒ Additional phases of development that are planned for the future
- ☐ Sealing caves, fractures, sinkholes, other karst features

☐ Disturbance of vegetation or wetlands

6. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

None

7. Describe existing disturbances, vegetation, and land use:

WWTP Site

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

8. List construction dates of all buildings and structures on the property:

Not Known

9. Provide a brief history of the property, and name of the architect/builder, if known.

WWTP Site

WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- **Do not mail this form with the application form.**
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, Texas 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, Texas 78753

Fee Code: WQP **Waste Permit No:** WQ0013643001

1. Check or Money Order Number:
2. Check or Money Order Amount:
3. Date of Check or Money Order:
4. Name on Check or Money Order:
5. APPLICATION INFORMATION

   Name of Project or Site: Bay Ridge

   Physical Address of Project or Site: 1.5 miles southeast of the intersection of FM 2354 and 1405

   If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space

THIS PAGE INTENTIONALLY LEFT BLANK

Section 1. Individual Information (Instructions Page 50)

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss):

Full legal name (first, middle, last):

Driver's License or State Identification Number:

Date of Birth:

Mailing Address:

City, State, and Zip Code:

Phone Number: Fax Number:

E-mail Address:

CN:

For Commission Use Only:
Customer Number:
Regulated Entity Number:
Permit Number:

CHECKLIST OF COMMON DEFICIENCIES

Below is a list of common deficiencies found during the administrative review of domestic wastewater permit applications. To ensure the timely processing of this application, please review the items below and indicate by checking Yes that each item is complete and in accordance applicable rules at 30 TAC Chapters 21, 281, and 305. If an item is not required this application, indicate by checking N/A where appropriate. Please do not submit the application until the items below have been addressed.

Core Data Form (TCEQ Form No. 10400) ☐ Yes
(Required for all applications types. Must be completed in its entirety and signed. Note: Form may be signed by applicant representative.)

Correct and Current Industrial Wastewater Permit Application Forms ☐ Yes
(TCEQ Form Nos. 10053 and 10054. Version dated 6/25/2018 or later.)

Water Quality Permit Payment Submittal Form (Page 19) ☐ Yes
(Original payment sent to TCEQ Revenue Section. See instructions for mailing address.)

7.5 Minute USGS Quadrangle Topographic Map Attached ☐ Yes
(Full-size map if seeking "New" permit. 8 ½ x 11 acceptable for Renewals and Amendments)

Current/Non-Expired, Executed Lease Agreement or Easement Attached ☐ N/A ☐ Yes

Landowners Map ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Things to Know:

- All the items shown on the map must be labeled.
- The applicant's complete property boundaries must be delineated which includes boundaries of contiguous property owned by the applicant.
- The applicant cannot be its own adjacent landowner. You must identify the landowners immediately adjacent to their property, regardless of how far they are from the actual facility.
- If the applicant's property is adjacent to a road, creek, or stream, the landowners on the opposite side must be identified. Although the properties are not adjacent to applicant's property boundary, they are considered potentially affected landowners. If the adjacent road is a divided highway as identified on the USGS topographic map, the applicant does not have to identify the landowners on the opposite side of the highway.

Landowners Cross Reference List ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Landowners Labels or USB Drive attached ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Original signature per 30 TAC § 305.44 – Blue Ink Preferred ☐ Yes
(If signature page is not signed by an elected official or principle executive officer, a copy of signature authority/delegation letter must be attached)

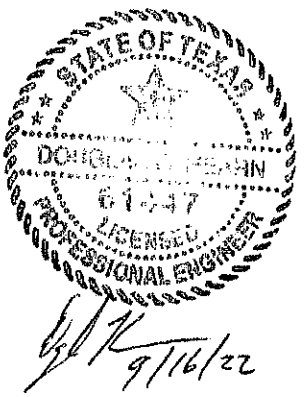
UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
CHAMBERS COUNTY, TEXAS
TPDES NO. WQ0013643001

SEPTEMBER, 2022

PREPARED BY:

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PHONE 512-310-0176
FIRM # F-1234



BAYRIDGE WWTP DESIGN REPORT
CHAMBERS COUNTY, TEXAS
UNDINE

ENGINEER: Douglas Hearn, P.E., R.P.L.S.
Hearn Engineering, Inc.
P.O. Box 1104
Cameron, Texas 76520

DATE: 09/16/22

DESIGN PARAMETERS:

Permitted Flows:

Average Daily Flow =	0.100 mgd =	69	gpm (Qavg)
2-hour Peak Flow =	0.30 mgd =	208	gpm (Qpk)
Peak Factor =	3.0		

Influent Strength:

CBOD5 =	250 mg/l =	209	ppd
TSS =	250 mg/l =	209	ppd
NH3-N =	40 mg/l =	33	ppd

Effluent Limits:

$CBOD_5$ =	10 mg/l
TSS =	15 mg/l
NH_3-N =	3 mg/l
D.O. =	4 mg/l

Process Design: The existing treatment plant utilizes the extended aeration process. The proposed modifications are intended to replace the existing plant with similar process which will produce effluent that will meet the permit requirements of BOD5 = 10 mg/l, TSS = 15 mg/l, D.O. - 4 mg/l, pH between 6.0 and 9.0 standard units, and Chlorine Residual = 1 mg/l after 20 minute detention time at an average daily flow of 100,000 gpd. The anticipated operating range for MLSS is 3,000 mg/l.

Design Features: The two existing gravity collection systems flow to the lift stations which pump to the plant. Flows into the plant will enter thru a bar screen. After passing thru the aeration basin, flows automatically transfer aerated sludge into the clarifier. Clear water will overflow the perimeter weirs and travel to a new chlorine contact chamber where it is dosed with liquid chlorine by a chemical feed pump. The chamber is sized to allow 20 minute detention time prior to beind discharged into the pipe to the bay. Settled sludge from the clarifiers will either be returned to the aeration basin where it will be mixed with the influent (RAS) or wasted to the sludge holding basin (WAS) where it can be thickened before being liquid hauled to a TCEQ approved facility by a TCEQ licensed hauler. Three regenerative blowers will provide air for the aeration basin, sludge holding, chlorine contact, and the air lift pumps while reducing noise. The plant design includes a manual transfer switch for a generator. An alarm dialer has been installed on the plant to alert personnel in the event of power outages and high levels.

BAYRIDGE WWTP DESIGN REPORT

AERATION BASIN:

Criteria:

Organic Loading =	30	lbs BOD_5/1,000 cf
Oxygen Requirement =	2.2	lbs/lb BOD_5
	4.6	lbs/lb NH_3 - N

Volume Required:

Influent BOD_5 =	209	ppd
Minimum Volume =	6,950	cf

Basin Dimensions:

Number of Basins =	1.00		
Sidewater Depth =	10.0	ft	
Basin Dimensions =	12.0	ft Wide x	58.0 ft Long
Actual Basin Area =	696	sf	
Actual Basin Volume =	6,960	cf	

Actual Loading:

Organic Loading =	30.0	lbs BOD_5/1,000 cf

Oxygen Requirement:

$$O_2R = (1.2(BOD_5)+4.3(NH_3\text{-}N))/BOD_5)$$

O_2R = 1.89 lbs O_2 / lbs BOD_5

Airflow Requirement:

$$RAF = \frac{(PPD\ BOD_5 * O_2R)}{(WOTE*0.23*0.075*1440)}$$

Diffuser Eff. =	4%	
RAF =	396	scfm
TCEQ Minumum Air Requirement =	3,200	* lbs BOD_5/1440
=	463	cfm

Aeration System:

Number of Diffusers =	19	
Airflow per Diffuser =	25	scfm/diffuser
Diffuser Submergence =	8.00	ft

BAYRIDGE WWTP DESIGN REPORT

CLARIFIER:

Criteria:

Surface Loading =	600	gpd/sf @ average flow
	1,200	gpd/sf @ peak flow
Detention Time =	3.0	hrs @ average flow
	1.8	hrs @ peak flow
R.A.S. Rate =	150%	

Basin Requirements:

@ Average Flow =	167	sf
	1,671	cf
@ Peak Flow =	250	sf
	3,008	cf
Number of Basins =	1	
Minimum Diameter =	17.8	ft

Basin Dimensions:

Number of Basins =	1	
Basin Diameter =	18.0	ft
Sidewater Depth =	10.0	ft
Actual Surface Area =	254	sf
Actual Volume =	2,545	cf

Actual Surface Loading:

@ Average Flow =	393	gpd/sf
@ Peak Flow =	1,179	gpd/sf

Actual Detention Time:

@ Average Flow =	4.6	hrs
@ Peak Flow =	1.5	hrs

Weir Loading Rate =	20,000	gpd/lf @ peak flow
Min. Required Weir Length =	15.0	lf

CHLORINE CONTACT CHAMBER:

Criteria:

Detention Time =	20	min @ peak flow
Airflow =	20	scfm/1,000 cf

Volume Required:

Peak Flow =	208	gpm
Minimum Volume =	557	cf

Basin Dimensions:

Number of Basins =	1		
Sidewater Depth =	7.0	ft @ peak flow	
Basin O.D. =	12.0	ft x	8.0 ft
Actual Basin Area =	96.0	sf	
Actual Basin Volume =	672	cf	

Aeration System:

Airflow =	13	scfm
Number of Diffusers =	1	
Airflow per Diffuser =	20	scfm/diffuser
Diffuser Submergence =	6.0	ft

BAYRIDGE WWTP DESIGN REPORT

SOLIDS HANDLING:

Criteria:

TCEQ Basin Design Volume =	10	cf/lb BOD_5/day		
TCEQ Min. Required Airflow =	30	scfm/1000 cf		
Min. Sludge Retention =	15	days		
Influent BOD_5 =	250	mg/l =	209	ppd
Effluent BOD_5 =	10	mg/l =	8	ppd
Removed BOD_5 =	240	mg/l =	200	ppd
Required Volume =	2,002	cf		

Basin Dimensions:

Number of Basins =	1			
Sidewater Depth =	10.5	ft		
Basin Dim. =	12.0	ft x	16.0	ft
Actual Basin Area =	192	sf		
Actual Basin Volume =	2,016	cf		

Aeration System:

Required Airflow =	60	scfm
Number of Diffusers =	3	
Airflow per Diffuser =	20	
Diffuser Submergence =	8.5	ft

BLOWERS REQUIRED:

Aeration Basin		463 scfm
Chlorine Contact Basin		13 scfm
Digester		60 scfm
Air Lift @ 10 scfm/ea	4	40 scfm
Total Aeration Required		577 scfm

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
CHAMBERS CO., TEXAS
TECHNICAL SPECIFICATIONS
INDEX

ITEM NO. 1

GENERAL

1.01 Scope of Work: The work covered by these Specifications consists of furnishing all labor, equipment, machinery and materials and performing all operations in connection with the construction of wastewater system improvements for Undine, L.L.C.. Wherever the term "Engineer" is used in the Specifications, it shall be construed to mean "Hearn Engineering, Inc.", or its designated representatives.

1.02 Construction Site: During construction the Contractor shall keep the site free and clear of all rubbish and debris and shall clean-up the site promptly when notified to do so by the Owner's representative. The Contractor shall, at his own expense, maintain streets free from dust, mud, excess earth or debris which constitutes a nuisance or danger to the public using the thoroughfare or the occupants of adjacent properties. Care shall be taken to prevent spillage on streets over which hauling is done, and any such spillage or debris due to construction operations shall be immediately removed.

1.03 Backwork: The Contractor shall coordinate his operations in such a manner as to prevent the amount of clean-up and completion of backwork from becoming excessive. Should such a condition exist, the Owner's representative may order all or portions of the work to cease and refuse to allow any work to commence until the backwork is done to his satisfaction.

1.04 Grading: The Contractor shall do such grading in the area adjacent to backfilled trenches and structures as may be necessary to leave the area in a neat and satisfactory condition, approved by the Owner's representative.

1.05 Inspection of Work: The principal inspection for the work covered under this Contract shall be by the Owner and his designated representatives. The quality of material and the quality of installation of pipe and related equipment shall be to the satisfaction of the Inspector. It shall be the Contractor's responsibility for the construction methods and safety precautions in the undertaking of this Contract.

1.06 Notification: The Owner must be notified a minimum of 24-hours in advance of beginning construction.

1.07 Testing And Acceptance of Improvements: The Owner's representative will be present at the testing and balancing of electrical systems, mechanical systems, and linework. The Contractor will test all lines and be confident that the lines will be able to pass the test prior to calling the Owner's representative to observe the tests. No lines will be accepted by the Owner without the Owner's representative observing the tests and certifying to the lines passing the pressure tests as specified herein.

In addition, all water-containing vessels (i.e., ground tank, pressure tank, etc.) shall be tested for leakage prior to being placed in service. The maximum allowable leakage for the 24-hour testing period shall be 1/4-inch plus the daily evaporation rate as established by the NWS.

1.08 Work in Freezing Weather: Portions of the work may continue as directed by the Owner's representative.

1.09 Property Lines and Monuments: The Contractor shall be responsible for the protection, reference and resetting of property corner monuments if disturbed.

1.10 Contractor's Use of Premises: The Contractor shall, at his own expense, provide additional space as necessary for his operations and storage of materials. The Contractor shall be responsible for providing and maintaining all needed construction related facilities as part of the contract including, but not limited to telephone, fax services, job office, electricity, potable water, sanitary facilities, security, and waste disposal. The Contractor shall not use the facilities of the Owner without permission. The site shall be kept free of debris at all times.

1.11 Trade Names: Except as specified otherwise, wherever in the Specifications an article or class of material is designated by a trade name or by the name or catalog number of any maker, patentee, manufacturer, or dealer, such designations shall be taken as intending to mean and specify the articles described or another equal thereto in quality, finish, and serviceability for the purpose intended, as may be determined and judged by the Engineer in his sole discretion.

1.12 Materials And Workmanship: No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written consent of the Engineer. Where materials or equipment are specified by a trade or brand name, it is not the intention of the Owner to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality for 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 item, in the opinion or judgment of the Engineer. Unless otherwise specified, all materials shall be the best of their respective kinds and shall be in all cases fully equal to approved samples. Notwithstanding that the words "or 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 shall be approved in writing by the Engineer and the Engineer shall have the right to require the use of such specifically designated material, article or process.

1.13 Operation and Maintenance Manuals: Six (6) sets of complete Operation and Maintenance (O&M) Manuals shall be supplied by the equipment manufacturer at the time of shipment. Manuals shall be submitted for approval by the Engineer.

1.14 Service: The equipment manufacturers shall provide the services of a technical service representative to inspect and adjust the completed installation and to instruct the Owner's personnel in the care and operation of the equipment specified herein. The manufacturers shall maintain a service organization available on call with spare parts from local stock. All equipment provided on this project shall be guaranteed against defects of material and workmanship for a period of one (1) year from date of acceptance of the project by the Owner.

Field service shall be included in each equipment manufacturer's bid to check out the installed equipment, place it in operating service and provide start-up and maintenance instruction service to the plant operating personnel. Field service time is not intended to include any time in the field required to correct fabrication or installation errors, and any charges resulting from time required for this must be resolved between the manufacturer and/or equipment supplier and the General Contractor. The equipment manufacturer shall coordinate all field service trips with the General Contractor and the Owner's representative.

1.15 "AS-BUILT DRAWINGS": The Contractor shall furnish to the Engineer one (1) set of marked-up Plans, showing all the changes and deviations made to the original Plans during the construction of this Project. Dimensions shall be provided where necessary to properly locate all structures,

pipelines and appurtenances. Three (3) sets of electrical "as-built" wiring diagrams shall also be furnished to the Engineer for all equipment and controls by the Electrical Subcontractor through the General Contractor. The Engineer will record the changes, include the electrical diagrams on the original Plans and provide the required sets of "as-built" Plans to the Owner.

1.16 Safety: All work shall comply with the rules set out by the Occupational Safety and Health Act. A minimum of one competent person, that is not working in the excavation, shall monitor excavations exceeding four feet in depth. The person shall be trained to recognize dangerous conditions, proper use of trench protection, CPR, and First Aid in accordance with 29 CFR 1926, Subpart P. All excavations over five feet deep shall be shored, shielded, or sloped in accordance with 29 CFR, Subpart P.

1.17 Measurement And Payment: No separate payment for work performed under this item. Include cost of same in contract price bid for all items of which this work is a component.

ITEM NO. 2

SITE PREPARATION

1.01. Scope: This section of the specifications describes materials and equipment to be utilized and requirements for their use in preparing the work site for construction and performing all earthwork. Site clearing and grubbing within the construction area will be performed by the Contractor. The Contractor shall furnish all materials, equipment and labor necessary to complete the work.

1.02. Underground Soil Data: No soil borings have been taken on this project.

1.03. Existing Underground Utilities and Obstructions: The Drawings indicate underground utilities or obstructions that are known to exist according to the best information available to the Owner. The site shall be carefully scrutinized for evidence of utilities. Prior to any ground disturbance, the contractor shall call the Texas One Call system at 811for utility locates. Calling the number will only confirm the existence of underground utilities owned by companies that subscribe to the service. There may be other utilities in the area and the Contractor will be responsible for insuring that no damage is done to any utilities whether shown or not shown.

A. Electronic Pipe and Cable Finder: Furnish and have available at all times an electronic pipe detector, in good working order, to locate existing pipe lines or other obstructions.

B. Relocation of Services: Locate all utilities services to avoid interference with such services and determine whether these services should be relocated. Repair any damage done to utilities services or pipe line resulting from efforts to locate services or resulting from the construction operation.

NOTE: Any delay or extra cost due to encountering underground utilities or obstructions not shown on the Drawings or found in locations different from those shown on the Drawings shall not constitute a claim for additional payments.

1.04 Surface Drainage: The contractor shall prevent surface water and ground water from flowing into excavations and from flooding project site and surrounding areas. De-water excavated areas as required to remove any water.

2.00 Clearing: The Contractor shall clear from areas indicated on the plans all natural and artificial obstructions, including, but not limited to trees, stumps, brush, shrubs, rubbish, existing storm sewers, abandoned utility lines and debris with the exception of trees designated to be left in place. The natural ground surface shall be cleared of all vegetable growth, such as trees, logs, stumps, roots of downed trees, brush, grass, weeds. Contractor shall haul all trash, rubbish and debris from site prior to starting excavation or grading. Unless otherwise authorized, the area to be cleared and grubbed shall include the work area plus three feet outside the work area.

A. Removal Procedures:

1. Stumps: Remove to a depth at least 3 feet below finished subgrade and backfill with suitable material to a density not less than that of adjacent soil.

2. Abandoned Obstructions: Remove or break down masonry and asphalt structures to a depth of at least 1 foot below finished grade. Thoroughly crack or otherwise

break abandoned structures remaining in place which may impound water where they exist within 10 feet of finished grade backfill with suitable material to a density not less than that of adjacent soil.

3. Tap roots and other significant objectionable matter: Remove to a depth of at least 1 foot below subgrade.

4. Protect from damage those trees and bushes not designated on the Drawings to be removed.

5. Accomplish clearing and grubbing well in advance of earth work to allow sufficient time for inspection and staking.

3.00 Excavation: The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and levels shown on the Drawings and/or specified. Excavation may be accomplished by any customary method.

A. Unsuitable Subgrade Material: Any material in the opinion of the Engineer which is unsuitable for subgrade shall be removed and replaced with compacted earth material as directed by the Engineer.

B. Topsoil: Topsoil shall be stripped from the construction areas. Material determined suitable by the Engineer shall be stockpiled on site at a location designated by the Engineer. Unsuitable material shall be removed from the site. Replacing topsoil after final grading operation is included in this work. Stockpiled topsoil shall be spread evenly over designated areas at the end of grading operations. Rough grade elevations extending 30' outside the building perimeter shall be 6" lower than the finish grades shown on the plans.

C. Disposal of Material: Unless otherwise specifically authorized, all objectionable material is the Contractor's property and must be removed from the project area.

4.00 Proof-rolling: Proof-rolling shall consist of the moving an 18 ton tandem dump, or equal, to cover base thoroughly by lapping the tires one width each pass to assure a minimum tolerance of a 1/2" settling and no cracking or pumping, prior to any paving. This is to be witnessed by the engineer.

Subgrade shall be proof-rolled with six passes of the roller. Depressions that develop during the proof-rolling operation shall be filled with suitable material and those filled areas shall be proof-rolled with six passes of the roller. If, after having been filled and proof-rolled, the subgrade still contains depressions, the area shall be undercut to the full depth of the soft material or 5 feet whichever is less, backfilled, and rolled to achieve a subgrade acceptable to the Engineer.

After the proof-rolled subgrade has been accepted by the Engineer, the surface of the subgrade shall be finished rolled with a smooth steel wheel roller weighing not less than 10 tons.

Conduits, pipes, culverts, and underdrains shall be neither disturbed nor damaged by proof-rolling operations. Rollers shall neither pass over, nor approach closer than five feet to, conduits, pipes, culverts, and underdrains unless the tops of those products are deeper than three feet. Areas not rolled due to the proximity to conduits, pipes, culverts and underdrains shall be hand tamped.

5.00. Compaction: Scarified soil and fill material shall be compacted to dry densities as determined by

the Standard Proctor Compaction Test performed in accordance with ASTM D 698. The fill material shall be spread in loose lifts of not more than eight inches and shall be compacted with a vibratory or sheepsfoot roller. Each lift shall be compacted to a minimum density of 95% of the maximum dry density as determined in accordance with ASTM D 698, current edition. The fill soil moisture content shall be maintained within 3% of the optimum moisture content as determined in accordance with ASTM D 698, current edition.

5.01 Compaction of fill shall be by sheepsfoot rollers with staggered uniformly spaced knobs and suitable cleaning devices. The projected area of each knob and the number and spacing of the knobs shall be such that the total weight of the roller and ballast when distributed over the area of one row of knobs shall be 250 psi. Placement and compaction of materials shall extend beyond the final contours sufficiently to insure compaction of the material at the resulting final surface. Final contours shall then be achieved by a tracked bulldozer shaping the face of the embankment.

Compaction of backfill around structures shall be accomplished by heavy power tamping equipment.

If tests indicate that density of fill is less than that specified, the area shall be either re-compacted or undercut, filled, and compacted until specified density is achieved at no cost to the Owner.

6.00 Construction Along Highways, Streets, and Roadways: Conduct all construction related activities along highways, streets and roadways in accordance with the applicable regulations of the City, County, and State with reference to construction operations, safety, traffic control, road maintenance and repair.

A. Protection of Traffic: Provide and maintain suitable signs, barricades and lights, as required by the County, for protection of traffic. Replace all highway signs removed for construction as soon as possible. Do not close or block any highway, street, or roadway without first obtaining permission from the proper authorities. Flagmen shall be provided to direct and expedite the flow of traffic.

B. Construction Operations: Perform all work along highways, streets and roadways to least interfere with traffic.

1. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.

C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off of the pavement.

D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.

E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, and roadways in suitable condition for movement of traffic until completion and final acceptance of the work. Use steel running plate to maintain traffic until pavement replacement is completed.

5.00 Building Site Preparation: The Contractor shall grade the site to conform with the subgrade elevations for the building and paving areas and shall grade all other areas to the finish contour elevations shown on the plans. All grading and excavation shall be in accordance with the following requirements:

A. Extent of Work: The building pad area shall be extended 5' beyond the exterior walls of the building to allow for foundation construction.

B. Proof-rolling: The building pad area and all areas to receive fill shall be proof-rolled as described above. Any yielding, pumping or soft areas shall be cut-out and replaced with fill compacted as specified herein.

C. Fill Material: The fill soil used to bring the site to grade shall be limited to soils classified in accordance with ASTM D 2487 as GM, GC, SW, SP, SM, SC, ML and CL. The on-site soils in the cut section are generally of a satisfactory classification. The classification of the soil material used for the building pad areas shall be verified by an approved soils testing laboratory during construction.

D. Compaction: See above.

E. Backfill: Backfilling of walls, structures and trenches shall be compacted in six inch loose lifts. Each lift shall be compacted using a mechanical tamp such as a vibratory or impact type compactor. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing or harrowing until moisture content is reduced to a satisfactory value.

F. Slopes: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Shore and brace as necessary.

1.07 Backfilling and Embankment: Fill materials shall be placed as required to provide compacted backfill for pavements.

A. Materials: Fill materials shall be free of organic or other perishable material and shall not contain stones or rubble. No material shall be placed when frozen.

B. Soil Sterilization: Soil shall be sterilized and void of live vegetation in an area contained within limits one foot outside the proposed edge of pavement. Herbicide shall be HYBAR XL by Dupont applied at a rate of 10 gallons per acre (follow dilution instructions on label) or PRIMATOL by Ciba Geigy applied at a rate of 20 gallons per acre (follow dilution instruction on label).

C. Proof-rolling: All areas beneath new roadway pavement shall be proof-rolled to detect soft spots after scarification and compaction but before placement of primer and pavement. Contractor may at his option proof-roll areas prior to scarification.

D. Scarification: Following proofrolling, the construction area shall be stripped of topsoil and all unsuitable materials removed as described under Excavation. The area shall then be scarified to a depth of at least eight inches with a disc harrow. Soil shall be well pulverized and mixed (sand-clay) to a depth of eight inches.

E. Compaction: See above.

1.08 Final Grading: Graded areas shall be made to blend into conformation with remaining ground surfaces. All surfaces shall be left smooth and free to drain.

1.09 Payment: Payment for all equipment, labor and materials required to clear; grub; remove; pipe; sterilize soil; scarify, grade and roll road beds, building pads, embankments, and fill for site; in this section of the Specifications shall be included in the unit price bid in the Proposal for the grading and for clearing as it pertains.

ITEM NO. 3

CAST-IN-PLACE CONCRETE

1.00 GENERAL

1.01 General: The General Conditions and Special Conditions of the Specification are incorporated herein. Also incorporated herein is ACI Standard 301, "Specifications for Structural Concrete for Buildings," and ACI Standard 318, "Building Code Requirements for Reinforced Concrete." ACI Standard 301 mentioned above is incorporated in its entirety with modifications, exclusions, expansions, noted hereinafter. Items noted thus (*_____) refer to the indicated section of ACI Standard 301. Copies of ACI Standard 301 are obtainable at a nominal cost from the American Concrete Institute, P.O. Box 4754, Redford Station, Detroit, Michigan 38219. A copy of this standard will be maintained in the Contractor's job site office at all times. All Standards cited in this specification shall be current edition.

1.02 Shop Drawings: Submit in accordance with General Conditions; obtain final corrections and review prior to fabrication.

A. Reinforcing Steel: Show dimensions, schedule, bending details, bar lists, and placing plans. Shop drawings showing all dimensions necessary for fabrication and placing of the reinforcing steel and accessories, with out reference to the project drawings, shall be submitted for approval. Approval shall be obtained before fabrication.

B. Checking: The Contractor shall require that the material supplier submit a signed written statement, in conjunction with the shop drawing submittal, that the drawings have been checked for compliance with the contract requirements. Such checking shall include but not be limited to size, shape, length, quantity, and location. The checking shall have been performed by a person or persons regularly engaged in drawing checking, and shall not be the person or persons who prepare the drawings.

2.00 CONCRETE

2.01 Admixtures: Air-entraining admixtures (ASTM C260) are not required in all concrete unless noted. Calcium chloride admixture (ASTM D98) will not be permitted. Use of "Pozzolith" water-reducing admixture (manufactured by the Master Builders Company) will be required in all concrete used in the base slabs, interior division walls, and perimeter walls. (*2.2)

2.02 Concrete: Concrete shall be ultimate stress type which shall develop 3000 psi compressive strength at 28 days. All concrete shall be of normal weight. (*3.2). All concrete exposed to the weather shall contain an air-entraining agent for protection against potentially destructive exposure. (*3.4). Concrete shall be vibrated and slump shall be in accord with Table 305(a) of ACI 301-66.

2.03 Proportioning of Ingredients: Mix designs shall be established by Method 2 or Alternate Procedure (d), but all 3000 psi concrete shall contain not less than 4 bags of cement per cubic yard of concrete except that the 3000 psi 6" slump concrete shall contain not less than 4-3/4 nor more than 5-1/4 bags of cement per cubic yard of concrete, and not more than 7.5 gallons of water per bag of cement. (*3.8).

2.04 Curing: Use of compounds as noted in (b) (5) is prohibited for curing. All curing shall be damp curing. Where floors are scheduled for cement finish, floors shall be treated, after final curing, with 3 full, even coats of Sonneborn Building Products, Inc.'s Lapidolith Liquid Floor Hardener, Euclid Chemical Company's Euco Liquid Floor Hardener, or A.C. Horn Products' Hornolith. (*Chapter 12).

3.00 FORMWORK

3.01 General: Assume all responsibility for the design and engineering of the formwork as well as its construction and removal. Design formwork for the loads, lateral pressure, and allowable stresses outlined in "Recommended Practice for Concrete Form work", ACI 347.

3.02 Materials: Facing materials shall be such as to provide the specified surface finish. Form coating shall be a field applied chemical concrete release agent capable of preventing bond between poured concrete and the form and shall contain no oil; or shall be factory applied non-absorptive liner. Coat forms before reinforcement is placed.

3.03 Tolerances: Formwork shall be constructed so that concrete surfaces will conform to the tolerance limits specified in Table 4.3.1 "Tolerances for Formed Surfaces," ACI 301. Provide positive means of adjustment (wedges or jacks) of shores and struts to compensate for anticipated deflections and settlement in the formwork during concrete placing operations.

3.04 Form Construction: Contractor shall build forms tight to prevent loss of mortar from the concrete. Provide clean-out openings at base of column, pier, and wall forms to facilitate cleaning and observation immediately before concrete is placed. Unless shown otherwise on drawings, corners of concrete members exposed to view after all other finish materials are in place shall be beveled by the use of chamfer strips, measuring 1/2" across the beveled face, placed in the forms. Submit sample for approval before proceeding. Overlap and hold forms against hardened concrete of a previous placement to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

3.05 Removal of Forms: Shoring and forming may be removed from formed members when concrete attains 75% of the 28-day design strength, but not earlier than 7 days after placing. Testing of field cured cylinders is required to established strength for form removal. Cylinders shall be molded and tested as specified ASTM C31, ACI 301. Testing to determine field strength shall be made at no extra cost to the Owner.

3.06 Reshoring: Members to receive construction loads shall be reshored so as to distribute construction loads safely to the ground or to members capable of supporting the construction loads without exceeding their design live load. Members supporting construction loads shall have gained the full specified 28-day concrete strength prior to loading.

3.07 Camber:

A. Cantilever Slabs: Camber at end of cantilever in increments of 1/8-inch per 5-foot of length.

B. One-way Slabs: Camber at midspan in increments of 1/8-inch per 10-foot of span.

C. Two-Way Slabs: Camber at center of bay in increments of 1/8-inch per 10-foot of diagonal distance between supports.

D. Camber all slabs except cantilever slabs less than 5-foot length and one-way slabs less than 10-foot span or as indicated on PLANS.

E. Do not camber beams unless indicated on PLANS.

4.00 REINFORCING STEEL

4.01 Material

A. Reinforcement shall be fabricated from ASTM A615 and Supplement S1 Deformed Billet Steel Bars for Concrete Reinforcement 60,000 psi yield point strength.

B. Welded smooth wire fabric (W) shall conform to "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" ASTM 185 and shall be fabricated from plain wire conforming to "Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement" ASTM A82-76.

C. Welded deformed wire fabric (D) shall conform to "Specifications for Welded Deformed Steel Wire Fabric for Concrete Reinforcement" ASTM A497 and shall be fabricated from deformed wire conforming to "Specifications for Deformed Steel Wire for Concrete Reinforcement" ASTM A496.

D. Wire bar supports shall conform to the National Bureau of Standards PS7, "Wire Bar Supports for Reinforced Concrete Construction."

E. Precast concrete block bar supports shall be Precast Concrete Doweled Blocks or Precast Concrete Blocks with wires as indicated in the Manual of Standard Practice CRSI Current Edition.

F. Bar supports shall be as follows:

1. On Ground: Precast Concrete Block Supports or Class "A" Bright Basic Bar Supports with earth-bearing bases (sand plates) of 20 gauge metal;

2. Interior: Class "B" Pre-galvanized Bar Supports or Class "E" Special Stainless Supports;

3. Exterior: Class "D" Hot Dipped Galvanized Bar Supports conforming to Table I, ASTM A153 or Class "E" Special Stainless Bar Supports; and,

4. Tie wire shall not be less than 16 gauge black annealed wire.

1.03 Fabrication

A. All hooks shall be bent using the pin diameters and dimensions as defined as "ACI Standard

Hooks" in the Manual of Standard Practice CRSI current edition, unless otherwise shown on the drawings.

B. Reinforcing bars shall not be bent or straightened in a manner that will injure the materials.

C. Reinforcing bars shall conform to the dimensions shown on the plans and within the fabrication tolerances as shown in the Manual of Standard Practice CRSI current edition.

1.04 Placing Reinforcement

A. Reinforcement shall be placed in designated positions in the forms and held in place, before and during the placing of concrete by means of bar supports, to carry the reinforcing bars they support within the following tolerances from the positions shown on the drawings or specified herein:

1. For clear concrete protection and for depth "d" inflexural member, walls, and compression members where "d" is:

8 inches or less ..... ±1/4 inch
More than 8 inches but
less than 24 inches ..... ±1/2 inch
24 inches or more ..... ±1.0 inch

but the cover shall not be reduced by more than one half of the specified cover.

2. For longitudinal location of bends and ends of bars:

±2 inches except at discontinuous ends of members where tolerance shall be ±1/2 inch.

3. For spacing:

±2 inches except that total number of bars shall not be reduced.

B. Except as shown otherwise on structural drawings, concrete cover for reinforcing bars shall be as follows:

1. Cast against and permanently exposed
to earth ..... 3 inches

2. Exposed to earth and weather... 2 inches

3. Interior formed surfaces:

Piers and Columns ..... 2 inches
Beams ..... 1-1/2 inches
Walls ..... 1 inch
Slabs ..... 3/4 inch

C. Vertical bars in piers and columns shall be offset one bar diameter at lapped splices. Furnish templates for setting dowels.

D. Bars which are straight except for hooks are listed in schedules as straight bars. Lengths shown are for straight segments, not hooks.

E. "Continuous" bars unless indicated otherwise on the drawings shall be lapped 30 diameters at splices. Provide corner bars at corner conditions.

F. Splices not shown in Contract Documents shall be subject to approval.

G. Lap welded wire fabric not less than the spacing of the cross wires plus 2 inches and wire together at splices.

H. Support all reinforcing bars. Space bar supports a maximum of 4 feet on center with the first support not greater than 2 feet from the end of bars. Tie to prevent displacement during concreting operations.

I. Reinforcement shall not be "field" bent after being embedded in hardened concrete except where specifically shown on the drawings.

5.00 MISCELLANEOUS

5.01 Expansion Joints: Premolded expansion joint filler shall conform to ASTM D1751 (*6.2).

5.02 Cast In Anchors and Dovetail Slots: Provide anchors for each 8-inch (or fraction thereof) of masonry abutting concrete, at 16-inches o.c. vertical spacing. Slots shall be continuous. Slots shall be 16 gauge, galvanized, 1-inch wide back x 5/8 inch wide face x 1 inch deep (Hohmann & Barnard #305). Anchors shall be corrugated, galvanized, 1 inch wide x 5-1/2 inches long, 16 gauge, (Hohmann & Barnard #303).

5.03 Testing: The Engineer will select a recognized commercial testing laboratory. In addition to the number of cylinders required by ACI Standard 301, the Contractor shall mold and the laboratory will test one extra cylinder at 7 days, which will be solely for advance information (*Chapter 16).

5.04 Mill Test Reports: Mill test reports reinforcing steel shall be furnished by the Contractor (*16.7.4.4).

5.05 Payment: No separate payment will be made for work done or materials furnished under this section since compensation therefor shall be included in the price bid for the item to which the work pertains.

ITEM NO. 4

PIPING

1.00 GENERAL

1.01 Work Included: All labor and materials to complete all work as shown on the Plans and as specified herein.

1.02 Care of Pipe Coating and Lining: Pipe shall be so handled that the coating or lining will not be damaged. If however, any part of the coating or lining is damaged, the pipe shall be subject to rejection.

1.03 General Requirements for Alignment and Grade: The pipe shall be laid and maintained to the required lines and grades with fittings and valves at the required locations; spigots centered in bells; and all valve stems plumb. The inside of the pipe wall at the bottom of the installed pipe shall slope continuously in the direction indicated and shall be located on the invert elevations indicated within 0.01 foot for gravity piping and within 0.03 foot for all other piping.

1.04 Deviations Occasioned by Other Structures: Wherever obstructions not shown on the Plans are encountered during the progress of the work and interfere to such an extent that an alteration in the Plans is required, the Engineer shall have the authority to change the Plans and order a deviation from the line and grade, or arrange with the Owners of the structures for the removal, relocation, or reconstruction of the obstructions. If the change in Plans results in a change in the amount of work by the Contractor, such altered work shall be done on the basis of payment to the Contractor for extra work under the requirements of the General Conditions, or credit to the Owner for less work. No deviations shall be made from the line and grade without the written consent of the Engineer.

1.05 Interruption of Service: No drainage channel, storm sewer, or other utility shall be put out of service without written approval of the Engineer and/or Owner.

1.06 Construction Drawings: The term construction drawings shall mean drawings, prints, descriptive literature, test reports, samples, calculations, schedules, material lists and information and items of similar meaning.

A. Submittals Required: The Contractor shall furnish to the Engineer and Authority for review in accordance with the procedure outlined below, drawings and descriptive literature for all manufactured or fabricated products. Additional information such as special drawings, schedules, calculations and curves, shall be provided as specifically requested by the Engineer and/or Authority.

B. Contractor's Review: The Contractor shall review and check drawings and submittals. He shall indicate his approval by initials and date. The Contractor shall furnish the Engineer with a minimum of five copies of all submittals. A transmittal form shall accompany each submittal or group of submittals.

C. Engineer's Review: All submittals will be reviewed, stamped, and dated by the Engineer

before they are returned to the Contractor. Acceptable submittals will be approved in writing with one copy returned to the Contractor and the remaining copies retained by the Engineer. Submittals requiring minor corrections before being acceptable will be so noted. Drawings must be resubmitted for review and approval prior to installation or use of products.

D. Drawings for Construction: Drawings or other submittals not bearing the Engineer's review notation shall not be issued to subcontractors or utilized for construction purposes. The Contractor shall maintain at the job site a complete set of construction drawings bearing the Engineer's review.

1.07 Threads: American Standard Pipe Thread shall be used for I.P.S. threaded work. No screwed pipe joints shall be caulked or connected with rope or packing of any kind. Burrs formed by cutting tools shall be reamed out and, before installation, each section of pipe shall be examined to see that it is clean and clear. Pipes shall be free from tool marks. When erecting plated, polished, or soft-metal piping, friction wrenches shall be used exclusively. In "marking up" screwed joints, Crane or Key White thread lubricant shall be used and applied to male threads only.

1.08 Supports and Anchors: Pipe supports, unless otherwise shown on the Plans, shall be provided at the base of all risers, at intervals not to exceed 5 feet on all runs of pipe 2 inches and smaller in diameter. Pipe run in groups shall be spaced equally and kept parallel throughout the length of the run. Pipe abutting walls or ceilings shall be supported by Unistrut P1000 channels, Figure 650 pipe clamps and hanger rods if necessary.

For pipe over 2 inches, hangers shall be Grinnel Company No. 260.

For pipe 2 inches and less, hangers shall be Grinnel Company No. 97. All items shall be galvanized.

Pipe supports shall be Grinnel Company No. 264, complete with proper size extension pipe and floor flange.

Expansion bolts and inserts driven into concrete slabs for pipe hangers shall be installed without injury to the structure.

Anchorage shall be provided for fittings where there is danger of pulling joint when under pressure.

1.09 Governing Standards: All products and work shall be in accordance American Water Works Association (AWWA) standards. In the absence of AWWA standards, work and materials shall comply with applicable American Society for Testing and Material (ASTM), American National Standards Institute (ANSI), National Sanitation Foundation, or other recognized standards. Latest revisions of all standards are applicable. All new pipes and related products must shall conform to ANSI / NSF Standard 61. If requested by the Authority, submit evidence that manufacturers have consistently produced products of satisfactory quality and performance for a period of at least two years.

2.00 MATERIALS

2.01 General: Piping material shall be as herein specified unless otherwise shown on the Plans. Standard Specification designations shall be the latest published designations.

2.02 Steel Pipe: Pipe 6 inches in diameter and smaller shall be designated black steel pipe (BS), galvanized steel pipe (GS), and Schedule 80 seamless steel pipe (Sch 80 Seamless) and shall be manufactured in accordance with ASTM A-120. The minimum class pipe shall be as designated in the Plans.

Fittings shall be 125 pounds and threaded, unless otherwise shown on the Plans. Unions larger than 3 inches shall be standard flanged unions. Welded fittings shall conform to ASTM A-234 with a wall thickness equal to or greater than the pipe wall. Mitered fittings shall conform to AWWA C-208. Flanges shall be ASA-150. Welding shall be in accordance with AWWA C-206.

Pipe larger than 6 inches shall be designated STL and shall be manufactured in accordance with AWWA C-201 or 202. Fittings shall be steel welded fittings ASTM C-208. Flanges shall be in accordance with AWWA C-207, hub type. Welding shall be in accordance with AWWA C-206.

Pipe 6 to 12 inches shall be Schedule 40; 14 to 28 inches shall be Schedule 10; and 30 inches and larger shall have a wall thickness of 5/16 inch (0.312").

2.03 Cast Iron Pipe Fittings (CIP): Fittings shall be in accordance with ANSI A-21.10 and AWWA C-110 for mechanical joints, ANSI A-21.11 for lock-type push-on joints and ANSI B-16.1 for flanged joints. Sizes 3 inch through 12 inch shall have a pressure rating of 250 psi minimum and sizes 14 inch and larger shall have a pressure rating of 150 psi minimum.

Flexible couplings shall be sleeve type with the middle stop removed. Couplings located underground shall be Smith-Blair 431 for the sizes provided therein. Otherwise, underground couplings shall be Smith-Blair 411 or Dresser Style 38 with a fusion epoxy coating. Above ground couplings shall be Smith-Blair 411 or Dresser Style 38. Flanged coupling adapters, with anchor studs and/or harnesses as indicated on the Plans, shall be Smith-Blair, Type 912 or Rockwell International, Type 913, for nominal diameters from 3 to 24 inches. Anchorage across flexible couplings with bent rods will not be permitted

2.04 Ductile Iron Pipe (DIP): Pipe shall be centrifugally cast ductile iron with the pipe barrel meeting all quality requirements of AWWA Specification C-151. Ductile iron pipe shall have a bituminous coating inside and outside, in accordance with AWWA C-104 standard thickness. Mechanical joint and lock-type push-on joint pipe shall be as designated on the Plans and in no case less than Class 50. Flanged ductile pipe shall be Class 53 minimum for sizes 3 inch through 18 inch and Class 55 for 20 inch and larger sizes.

All fittings shall be mechanical joint for underground piping and flanged joint for above ground piping. All standard fittings shall have a minimum Class 53 wall thickness rating. Compact "short body" fittings shall meet ANSI A-21.53 standards and shall be Class 54 minimum. all fittings shall have a minimum 350 psi pressure rating.

2.05 Copper Pipe (CU): Copper pipe shall be ASTM B-88-51, Type L. Pipe ½ inch in diameter and larger shall be "hard-drawn" and smaller than ½ inch shall be annealed. Fittings ½ inch and larger shall be streamline solder joint fittings and smaller than ½ inch shall be flared. Connections to

other piping, tanks, and pumps shall be made with dielectric unions.

In "making up" joints in copper tubing lines, only torches for that purpose may be used. Common blow torches will not be permitted.

2.06 Polyvinyl Chlorine Pipe (PVC): Polyvinyl chloride pipe for chlorine and chemical solutions shall conform to Commercial Standard CS207-60, Type 1, with a minimum wall thickness corresponding to Schedule 80 unless otherwise shown on the Plans.

All joints above ground shall be screwed and sufficient unions shall be used, so the piping can be disassembled without the need to cut pipe.

For buried water lines, all newly installed pipes and related products must conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI as required by 290.44(a)(1) of the TCEQ rules. All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 200 psi or a standard dimension ratio of 21 with single rubber gasket push-on joints or less as required in 290.44(a)(2) of the TCEQ rules. All 6" and 8" PVC pipe shall meet all requirements of AWWA C-900, SDR 18 with rubber gasket push-on joints.

2.07 Polyethylene Pipe (PP): Unless stated otherwise in the plans, water laterals or service connections shall be constructed using class 200, SDR 9 polyethylene which meets or exceeds P3408, ASTM D-2737 (latest revision) and has NSF approval for potable water systems.

2.08 Gaskets: All gasket materials shall be Crane's "Cranite" 1/16 inch asbestos sheet packing. Gaskets shall be coated with thread lubricant when being installed. Flange bolts shall conform to ASTM A-307.

2.09 Galvanized Steel Pipe (GS): Pipe 6 inches in diameter and smaller shall be schedule 80 seamless steel pipe manufactured in accordance with ASTM A-120. Fittings shall be 125 pounds and threaded with American Standard Pipe Thread, unless otherwise shown on the Plans.

2.10 Gate Valves (GV): Gate valves shall be mechanical joint end, double disc, parallel seat, iron body, bronze mounted, non-rising stem with O-ring stem seals, open left. Gate valves 3" through 12" shall be designed for a water working pressure of 200 psi and a test pressure of 400 psi. Valves 14" and larger shall be designed for a water working pressure of 150 psi and a test pressure of 300 psi. Valves 4" through 12" will be designed for installing in a vertical position. Valves larger than 14" will be designed for a horizontal installation and equipped with bevel gearing, gear case, tracks, rollers, scrapers and by-pass valves. Gate valves shall conform to AWWA standard specification C-500, latest revision for "Ordinary Water Works Service" and shall be Mueller No. A2380-20, American- Darling No. 55, or an approved equal.

2.11 Backflow Preventers: Backflow preventers shall be the reduced pressure type providing protection during the emergency conditions of either back siphonage or backpressure or a combination of both. Backflow preventers shall be certified by a nationally recognized testing laboratory as conforming to current requirements of NSF/ANSI 372, ASSE® Listed 1013, ASSE 1013, AWWA C 506, or USC-FCCC. The installation shall meet all applicable State and local codes.

Sizes 3/4-inch through 2-inch shall have bronze bodies with threaded connections and bronze union on either side of the device.

Sizes 2-1/2 inch and larger shall be bronze or iron bodies with corrosion resisting moving parts and trim and flange connections.

The device shall be equipped with three leak-proof test cocks. A fixed air gap, or funnel, shall be installed at the relief port. A drain line shall be piped from the discharge side of the air gap and shall be supported independently from the device. An auxiliary check valve and strainer shall be installed up stream of the device. Gate valves shall be installed upstream and downstream of the device. Backflow preventers shall be manufactured by Zurn Wilkins (Model 375 AST), Watts (No. 909 Series), Hersey, or equal.

2.12 Corporation Stops: Corporation stops shall be ground key type; shall be made of bronze conforming to ASTM B 61 or B 62; and shall be suitable for the working pressure of the system. Ends shall be suitable for solder-joint, flanged lead joint, or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C 800; coupling not for connection to flared copper tubing shall conform to ANSI B16.26.

2.13 Valve Boxes (VB): All gate valves shall be equipped with valve boxes. Valve boxes shall be heavy roadway type. The valve boxes shall be cast iron two-piece slip or screw type with drop covers. The valve boxes shall be adjustable to 6 inches up or down from the nominal required cover over the pipe. Typical valve setting details are shown on the plans.

2.14 Tapping Sleeves and Valves (TS&V): Tapping sleeves shall be of the split sleeves, mechanical joint type. Valves shall be gate valves furnished in accordance with the specifications shown above, with flanged connection to the tapping sleeve and mechanical joint connection to the branch pipe. The necessary bolts, glands, and gaskets shall be furnished. Tapping sleeves shall be Mueller No. 615 or equal. Tapping crosses shall be Mueller No. 715 or equal. Tapping valves shall be Mueller No. 667 or equal.

2.15 Tapping Saddles: Tapping saddles shall be ductile iron body type with O-ring gasket and alloy steel straps. Connection shall be flanged or mechanical joint as required.

2.16 Fire Hydrants (FH): All hydrants shall be Mueller A-423 Centurians conforming to the requirements of AWWA C 502 for 150 psi working pressure. Hydrants shall be the compression type, closing with line pressure with a minimum valve opening of 5-1/4".

In the event of a traffic accident, the hydrant barrel shall break away from the standpipe at a point above grade and in a manner which will prevent damage to the barrel and stem, preclude opening of the valve, and permit rapid and inexpensive restoration without digging or cutting off the water.

The means for attaching the barrel to the standpipe shall permit facing the hydrant a minimum of eight different directions. Hydrants shall be fully bronze mounted with all working parts of bronze. Valve seat ring shall be bronze and shall screw into a bronze retainer. All working parts, including the seat ring shall be removable through the top without disturbing the barrel of the hydrant. The operating nut shall match those on the existing hydrants. The operating threads shall be totally enclosed in an operating chamber separated from the hydrant barrel by a rubber O-ring

stem seal and lubricated by a grease or oil reservoir. A stop nut shall be positioned in the top operating mechanism so that the valve cannot contact the bottom of the shoe when fully open.

Hydrant shall be a non-freezing design and provided with a simple, positive, and automatic drain which shall be fully closed whenever the main valve is opened. Hose and pumper connections shall be breech-locked, pinned, and then caulked with lead; or threaded and pinned, to seal them permanently into the hydrant barrel. Each hydrant shall have two 2-1/2 inch hose connections using local fire district's Standard Threads, and one 4 inch pumper connection with National Standard threads. Equip each connection with cap and chain. Hydrants shall be furnished with a mechanical joint shoe connection to the spigot of the 6-inch hydrant lead. Minimum depth of bury shall be 4.5 feet. Provide extension section where necessary for vertical installation and in accordance with manufacturer's recommendations. All outside surfaces of the barrel above grade shall be painted with Koppers Glamortex 501 enamel or equal in a color to be selected by the Owner.

2.16 Check Valves: All check valves for clean water shall be series 1400 wafer style silent check valves as manufactured by Val-Matic or approved equal. Check valves in wastewater applications shall be weighted lever swing checks with resilient seats and epoxy coated cast iron bodies as manufactured by Val-Matic or approved equal.

2.17 Sludge Valves: All sludge valves shall be resilient-seated, cast iron eccentric plug valves as manufactured by Val-Matic or approved equal.

2.18 Supports and Anchors: Pipe supports, unless otherwise shown on the Plans, shall be provided at the base of all risers, at intervals not to exceed five feet on all runs of pipe two inches and smaller in diameter. Pipe run in groups shall be spaced equally and kept parallel throughout the length of the run. Pipe abutting walls or ceilings shall be supported by Unistrut P1000 channels with Figure 650 pipe clamps and hanger rods if necessary. For pipe over two inches, hangers shall be Grinnel Co. No. 260. For two inches and smaller, hangers shall be Grinnel Co. No. 9 (Galvanized). Pipe supports shall be Grinnel Co. No. 264, complete with proper size extension pipe and floor flange. Expansion bolts and inserts driven into concrete slabs for pipe hangers shall be installed without damaging the structure. Anchorage shall be provided for fittings where there is a danger of pulling joint when under pressure.

2.19 Pressure Reducing Valves (PRV): The Pressure Reducing Valve shall maintain a constant downstream pressure regardless of changing flow rate and/or inlet pressure. The valve shall be hydraulically operated, single diaphragm-actuated, globe or angle pattern with a ductile iron body. The valve shall consist of three major components: the body, with seat installed; the cover, with bearings installed; and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve designed to permit flow when controlled pressure is less than the spring setting. The pilot control is held open by the force of the compression on the spring above the diaphragm, and it closes when the delivery pressure acting on the underside of the diaphragm exceeds the spring setting. The pilot control system shall include a fixed orifice. No variable

orifices shall be permitted. The pilot system shall include an opening speed control on all valves as standard equipment. All PRVs shall be Cla-Val 90-01

3.00 PLUMBING

3.01 General: The Contractor shall furnish and install all piping, valves, fittings, and accessories to provide a complete plumbing installation as shown on the Plans and as specified. All materials shall be new and undamaged, and shall conform to the Specifications and to applicable codes.

3.02 Rules and Regulations: All work and materials shall be in full accordance with the latest rules and regulations of the National Fire Prevention Association and the State Fire Marshal; the safety orders of the State Division of Industrial Safety; the National Electric Code; the Uniform Plumbing Code published by the Western Plumbing Officials Association; and other applicable local or state laws or regulations. Nothing on the Plans or in the Specifications is to be construed to permit work not conforming to these codes.

When the Specifications call for materials or construction of a better quality or larger size than required by the above mentioned rules and regulations, the provisions of these Specifications shall take precedence over the requirements of the said rules and regulations.

The Contractor shall furnish, without any extra charge, any additional material and labor when required by the compliance with these rules and regulations, though the work may not be mentioned in these particular Specifications or shown on the Plans.

Spaces are provided in the design for the construction of the building to install the plumbing work and the Contractor shall keep all pipe within the furring lines established on the Plans, unless pipes are shown exposed.

All pipes shall be run in the approximate locations shown and shall be of sizes given on the Plans. Unless otherwise shown, pipelines shall be run parallel to, or at right angles to, the structure. Piping must be offset wherever necessary to obtain head room. In all cases, pipelines shall be installed to conform to the actual conditions found in the building such as offsetting to clear structural members, etc.

Holes for pipes through walls, domes, or ceiling shall be lined with 24-gauge galvanized steel sleeves with ½ inch flanges on each end. where pipes pass through walls, ceilings, or floors, they shall be fitted (in lavatory and chlorine rooms) with chrome-plated plates. Plates must be securely held in position allowing enough clearance for expansion.

Pipes through the roof shall be flashed and made watertight using SEMCO 6 pound seamless lead flashing with 6 inch shirt-and-caulk type counter flashing sleeve.

Wherever changes in sizes of piping occur, the changes shall be made with reducing fittings, as the use of bushings will not, in general, be permitted. Eccentric reducing fittings shall be used wherever necessary to provide free drainage of lines.

All "horizontal" drain pipes within the building shall have a minimum of 1/4 inch pitch per foot, unless otherwise marked or required to obtain the indicated inverts.

Cleanouts shall be installed where required or where indicated on the Plans. No cleanouts or valves shall be installed in inaccessible places. Where valves, traps, or cleanouts are installed in furred ceilings or walls, the Contractor shall furnish and install access plates and frames in the furring. Traps shall be capable of being disassembled without cutting the pipe.

The Contractor shall thoroughly clean all plumbing fixtures and trim free from rust, dirt, etc., before any covering or painting is done or the system put in readiness for final inspection.

The Contractor shall protect all vitreous-finished surfaces or fixtures with heavy paper plaster hereon, or by other means, throughout the period of construction.

The piping system shall be flushed out until it is thoroughly clean in the judgment of the Engineer.

All openings into pipes shall be effectively capped to keep foreign matter out while under construction.

After the completion of all work, all resulting debris shall be removed to leave the entire work in a complete and undamaged condition and the system adjusted to proper operation.

3.03 Materials:

Fixtures: Fixtures are specified on the Plans.

Floor Drains and Traps: Floor drains shall be cast iron as manufactured by number as shown on the Plans. Traps shall be cast iron and shall be installed as near as possible to the unit which they service.

Dielectric Fittings: Shall be provided wherever dissimilar metals are connected.

4.00 INSTALLATION OF PRESSURE LINES:

4.01 General All pipe and fittings shall be carefully examined for defects and no piece shall be installed which is shown to be defective. Special care shall be taken to avoid leaving bits of wood, dirt and foreign particles in the pipe.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. In the trench to prevent getting earth into the pipe, the Engineer may require that, before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer.

Pipe shall be laid with the bell ends or coupling ends facing in the direction of the laying unless directed otherwise by the Engineer or specifically indicated on the Plans.

All pipe shall be carefully placed and supported at the proper line and grade, and shall be sloped

to permit drainage. Minor adjustment may be necessary to avoid architectural and structural features. Major relocations shall be approved by the Engineer. Minimum earth cover shall be 30 inches, unless otherwise shown on the Plans.

Sufficient screw unions, flanges, joints, or flexible couplings shall be used to allow the convenient removal of any run of pipe without removing adjacent runs or equipment. Where practicable, make-up joints have been indicated on the Plans; however, omission of these joints from the Plans does not excuse the Contractor from their installation. Wherever a pipe larger than 3 inches in diameter is cast or grouted in place and passes from concrete to earth, a flexible coupling must be used on the earth side. Bare metal pipe passing from concrete to earth shall be wrapped with Scotch Wrap 60 for 3 inches each side of the concrete face on the earth side. All metal pipe below ground shall be wrapped with 4-mil polyethylene.

5.00 INSTALLATION OF GRAVITY LINES:

5.01 General: Wherever possible, the Contractor shall avoid the distribution of pipe to the trench site too far in advance of the laying operations. The Contractor shall exercise care in the unloading of the pipe so as to avoid damage caused by the unloading operations.

Immediately preceding the laying of a length of sewer pipe, it shall be visually checked for damage, defects, and to ensure that the inside of the pipe is clean and free from debris.

Both bell and spigot shall be clean before the joint is made, and care shall be taken that nothing but the joint-making material enters the joint.

If water is encountered in the trench, it shall be kept below the bottom of the bell of the pipe. Should the water, through neglect or otherwise, rise in the trench before the jointing operation is completed, the annular space in all pipe so affected shall be freed of all water and foreign matter and thoroughly cleaned before completing the jointing operation.

When pipe laying is not in progress, the forward end of the pipe shall be kept effectively closed with an approved temporary barricade.

6.00 CLEANING, DISINFECTION AND TESTING

6.01 General: Pressure and gravity lines shall be cleaned of all foreign matter and tested in the presence of and to the satisfaction of the Engineer. Leakage shall be corrected or, in the case of the sewer lines, shall be brought within the allowable limit at the Contractor's expense.

The Contractor shall furnish the necessary pumps, labor, equipment and materials and shall perform the required tests of the completed system before the system is placed in operation or connected to other lines.

6.02 Cleaning: The gravity and pressure lines shall be flushed clean prior to testing or disinfection.

6.03 Disinfection: Potable water systems shall be disinfected in accordance with AWWA C-651 "Procedure for Disinfecting Water Mains."

6.04 Testing: Testing shall be in accordance with TCEQ rules and guidance.

6.05 Water Mains: All testing of pipe shall be done under the supervision of the Inspector. The test section shall be bled of air and presoaked in a manner and for a time determined by the Inspector. The Contractor shall furnish all equipment and materials for the testing and shall perform such tests as follows:

a) Duration: The duration of the hydrostatic test shall be a minimum of four (4) hours.

b) Pressure: The test pressure shall be 150 psi actual hydrostatic pressure on the lowest point in the test section. The pressure gauge shall be no more than 30 feet above or below the lowest point; the gauge reading shall compensate for the actual difference in elevation and any movement (change in elevation) of the gauge shall necessitate beginning the test again. The actual hydrostatic pressure shall not exceed 155 psi at any time and not be less than 145 psi for more than 15 minutes. Every effort will be made to maintain an average pressure of 150 psi at the lowest point in each test section throughout the test.

c) Allowable Leakage: The maximum allowable leakage for push-on joints is the number of gallons per hour as determined by the following formula:

$$Q = \frac{(L)(D)(P)\,0.5}{148{,}000}$$

where: Q = Quantity of makup water in gallons/per hour
L = Length of pipe section being tested in feet
D = Nominal diameter of the pipe in inches
P = Square root of the average test pressure during the hydrostatic test in psi.

d) Filling Rates: Maximum filling rates in gallons per minute equivalent to filling velocities of 1 foot per second, for pipes flowing full.

Nominal Size	Flow Rate Q (gpm)
4	9.8
6	14.7
8	19.6
10	24.5
12	29.4
14	34.3
16	39.2
18	44.1
20	49.0
24	58.8
27	66.1
30	73.4
33	80.8
36	88.1
42	102.8
48	117.5

6.06 Air Piping: Air piping shall be tested for a period of four (4) hours at 100 psi or 1.5 times the operating pressure. There shall be no drop in pressure allowed.

6.07 Chlorine Solution Piping: Chlorine solution piping shall be tested with air for a period of four (4) hours at a pressure of 100 psi. There shall be no leakage allowed.

6.08 Gravity Lines: The pipeline shall be completely filled with water for its complete length or by sections as determined by the Engineer. If tested for its complete length, the maximum head at any point shall not exceed 25 feet unless otherwise indicated. If tested in sections, the manholes in the test section shall be completely filled with water. After the pipeline has been filled and allowed to stand for 24 hours, the amount of exfiltration shall be calculated. any amount in excess of 200 gallons per inch of inside pipe diameter per mile per day shall be cause for rejection.

6.09 Marking Tape: Detectable mylar marking tape will be installed over all non-metallic pipelines. Care shall be taken to insure that the buried marking tape is mylar encased aluminum foil. Test data for the tape shall be provided on request.

7.00 PIPE INSULATION

7.01 Piping: All piping 2 inches and smaller, and all exposed chemical feed, water supply, washdown and copper pipelines regardless of size, shall be insulated. Split ½ inch round insulation shall be used with a split PVC pipe covering utilizing galvanized metal straps as required. For piping that is not straight run, the insulation shall be pre-molded sectional urethane with aluminum wrap.

7.02 Valves: Valves and flanges which are an integral part of insulated lines shall be insulated with prefabricated urethane insulation covers as manufactured by Southwest Insulators, Inc. Covers shall be wired in place. All voids shall be made solid by pouring liquid urethane in the valve and flange covers. The covers shall be finished with black glass fab and sealed with a coat of Foster 60-26 weatherproofing. Refer to Plans for those valves larger than 2 inches that require insulation.

8.00 MEASUREMENT AND PAYMENT: No separate payment for work performed under this item. Include cost of same in contract prices bid for item of which this work is a component part, or include in yard piping.

ITEM NO. 5

WASTEWATER TREATMENT PLANT

1.00 GENERAL

1.01 General: The equipment manufacturer shall furnish for installation One (1) activated sludge treatment unit including all necessary equipment required for operation as described in these specifications. The new train consisting of aeration basin, clarifier, and sludge holding shall be designed to treat 100,000 gallons per day (GPD) of raw residential sanitary sewage containing 250 mg/l BOD_5 and 200 mg/l TSS with a two hour peak flow of 3 Q.

1.02 Principal Equipment: The principal items of equipment to include all process piping (including valves), scum, sludge collection, waste sludge pump, air supply and distribution system, chlorination system, flow metering with recording capabilities, and any accessory equipment included as a part of this specification. All equipment covered in this specification shall be furnished by a single manufacturer regularly engaged in production of this type equipment. The manufacturer shall be solely responsible for integrating all systems into a working system and shall be responsible for all startup and warrantee.

1.03 Regulatory Compliance: All equipment shall also be furnished to the engineer's specifications, and in accordance with applicable Texas Commission on Environmental Quality (TCEQ) Chapter 217 Design Criteria and the National Electric Code.

2.00 STRUCTURE

2.01 General: The plant shall be divided into zones as shown on the drawings. Steel plate and shapes shall be structural grade A-36, 1/4" minimum, and shall be joined by electric arc welding. Where required for strength or leak proofing, the weld shall be continuous and watertight.

2.02 Aeration Tanks: The inside length of the rectangular aeration/digester tank shall be as shown on the drawings.

A. Operating Water Depth: Shall be 10 feet 6 inches.

B. Volume: The volume of the aeration zones shall be as follows:

1. Aeration tank: 6,950 Ft^3

2. Digester: 2,002 Ft^3

C. Air Drops: Each tank shall have aeration diffuser droplines to provide air for mixing and proper aeration.

2.03 Clarifier: One (1) circular, flat-bottomed tank shall serve as a clarifier. Each cylindrical tank shall serve as a clarifier with center inlet and peripheral discharge. The inside diameter shall be 18'0" and the side water depth shall be 10 feet (based on the top of grout at outside of tank to mean water level). Overflow rate at average daily flow shall be 133 gallons/day/square foot. An influent-loading well of 4 diameter by 6' tall shall be provided to dissipate influent velocity and prevent short-circuiting. A 6" loading pipe shall be installed from the aeration zone to the loading well. The manufacturer

shall furnish a 8" gate valve on the inlet to the loading pipe to allow drawing of clarifier for service without draining the aeration tank.

A. Grout: The bottom of the clarifier shall be concrete with grout fill conforming to a 1 to 24 slope as shown by the drawings. The general contractor, using the collector as a guide for final finishing shall install the concrete.

B. Equipment: The equipment manufacturer shall provide mechanical sludge and scum collector. The collector arms shall be driven by a triple reduction gear system. The system shall consist of a single reduction worm gear drive with a flange-mounted motor, clutch with adjustable spring loaded adjustment, and planetary main gear drive.

1. Gear drives used in this system shall be commercial drives with parts locally available from PT distributors. The equipment manufacturer shall guarantee that parts and service are available with a 50-mile radius of this installation.
2. The output shaft of the main gear drive requiring no external bearings shall support the entire collection assembly.
3. The gear drive shall be equipped with a "zero speed" sensor to automatically disconnect illuminate an alarm light should the drive cease to rotate for any reason.
4. Scum collection shall be via skimmer arm with flexible wiper which deposits scum in a full width collection box with beach for removal by airlift pump.

C. Sludge Collection: Sludge Collection shall be via adjustable PVC scrapers at the bottom of the clarifier. Blades shall be attached to the support arms, arranged to convey settled sludge to a center collection hopper. Sludge from the hopper will be air lifted to the Aeration Zone in the normal mode.

D. Weir: Clarified liquid shall pass over an adjustable weir plate into the effluent trough. The weir shall be 11-gauge stainless steel plate. The effluent trough shall be an integral part of the clarifier wall as shown on the drawings. A scum baffle shall be installed inside the weir plate.

E. Airlift Pumps: Airlift pumps for sludge and scum shall be sized as shown under PIPING.

2.04 Access Walkway: Prefabricated walkway shall be provided for access to the clarifier drive unit. and to cover the entire area of aerated tanks. The structure shall be adequate for concentrated loads at the drive mechanism as well as live and dead encountered during normal operation (minimum 150 # lineal foot live load). Continuous handrails shall be provided around clarifier walkway a periphery of aeration tanks, walkway surface shall be 1x1-1/8" galvanized bar grate.

The aeration tanks and effluent holding tanks shall be completely covered with grating the same as used on the clarifier bridge.

2.05 Air Supply and Distribution: The equipment manufacturer shall provide three (3) blowers as manufactured by FPZ each blower shall be rated at 471 CFM @ 4.5 PSI, Model Number K09-MS. Blowers are complete with 20 HP 3000 RPM 3 ph/60hz/(208) volt horizontal TEFC motors. Blowers and motors shall be furnished fully assembled on a common steel base plate for installation on rack on side of treatment plant tank as shown. Each blower combination shall be complete inlet filter silencer, pressure relief valve, and flexible piping connections.

Air distribution on the plant shall be via steel pipe. (Plastic pipe shall not be allowed for air distribution or drop pipes.) Diffusers for process air shall be connected to the main Air Header through removable droplines located as shown on drawings. Diffusion devices shall be coarse bubble type with a minimum oxygen transfer efficiency of 5% at 20 CFM. The diffuser material shall be 304 stainless steel and inert. The drop pipe shall consist of galvanized schedule 40 steel pipe and be removable by one man without the use of hoists. Diffuser submergence shall be 9-6".

Diffusers shall be of the sparger type and have six air release slots designed to be non-fouling. Diffusers shall include defector plate to increase diffuser efficiency. Each drop line shall include clean out tee, which will permit "rodding" from above to clear any blockages

3.00 PIPING:

3.01 Piping: All piping required for the process located inside the limits of the plant structure shall be furnished by the manufacturer. Pipe stub-outs shall be provided to the exterior wall for connection to the external piping. Pipe sizes shall be as follows:

A. Influent: 8"

B. Effluent: 8"

C. Clarifier Loading: 8"

3.02 Airlift Pumps: Airlift pumps shall be schedule 40 galvanized steel completed with stainless steel air supply line, valves and supports. Sizes shall be:

A. Return Sludge Airlift: 4"

B. Scum Discharge From Clarifier: 3"

3.03 Valve Operators: All valve operators and/or automatic controls shall be accessible to the operator from the walkway and/or outside wall.

4.00 CHLORINATION/FLOW METERING SYSTEM:

4.01 Chlorine Contact Tank: Inside dimensions of the chlorine contact tank shall be as shown on drawings. Steel baffles shall be furnished by the manufacturer installed in the tank to promote plug flow. Existing liquid chlorine system shall be modified to dose in the new chlorine contact chamber.

4.02 Flow Meter: Effluent flow shall be metered using ultrasonic level measurement over a "V" notch weir. Meter to be as manufactured by Seimens, Inc. and be capable of displaying flow in GPM, provide flow totalizing, and 4-20 mA signal for driving chlorine feed pump and flow recorder.

4.03 Flow Recorder: Flow recorder shall be as manufactured by Honeywell, Model DR 4500. Charts shall be 12" circular and shall be programmable to allow operator to print charts from as little as 8 hours, to a maximum of 30 days; and be capable of displaying flows of 0 to 210 GPM, also programmable to provide operator flexibility.

5.00 ELECTRICAL:

5.01 Electrical Equipment: The manufacturer shall provide the controls for the blowers, sludge scraper mechanism, and flow meter. These controls shall be enclosed in three (3) NEMA 3R panels.

6.00 PAINTING/CORROSION PROTECTION:

6.01 Painting: Fabricated steel items not galvanized or plated will be finish painted. Below water items will be coated with coal tar polyurethane, "Corothane II, moisture cure paint" specifically designed for sewage treatment plant service (manufacturer Sherwin Williams, or equal).

All steel items not welded to the tank shall be hot dip galvanized or stainless steel.

ITEM NO. 6

ELECTRICAL

1.01 General Conditions: The drawings and specifications of other sections of this contract, as well as supplements issued thereto, information to bidders and pertinent documents issued by the Owner's representative are a part of these drawings and specifications and shall be complied with in every respect. All of the above documents will be on file at the office of the Owner's representative and shall be examined by all bidders. Failure to examine all documents shall not relieve the responsibility or be used as a basis for additional compensation due to omission of details of other sections from the electrical documents. The Contractor shall be responsible for visiting the site, checking existing condition, and ascertaining the conditions to be met for installing the work and bid accordingly.

1.02 Scope: The Contractor shall furnish all work, labor, tools, superintendence, material, equipment and operations necessary to provide for a complete and workable electrical system as defined by the contract documents. It is intent of the contract documents that upon completion of the electrical work, the entire system shall be in a finished, workable condition.

All work that may be called for in the specifications but not shown on drawings; or, all work that may be shown on drawings but not called for in specifications, shall be performed by the Contractor as if described in both. Should work be required which is not set forth in either document, but which work is nevertheless required for fulfilling of the intent thereof; then, the Contractor shall perform all work as fully as if it were specifically set forth in the current documents.

1.03 Definition of Terms: The definition of terms used in contract documents shall be in accordance with:

Underwriters Laboratories, Inc.
National Electrical Manufacturers Association
American National Standards Institute
Insulated Power Cable Engineers Association
National Electrical Code
National Fire Protection Association

1.04 Permits, Codes and Utilities: The contractor shall secure all permits, licenses, and inspections as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, rules, regulations and contract requirements bearing on the work. The minimum requirements of the electrical system installation shall conform to the latest edition of the National Electrical Code as well as state and local codes.

Codes and ordinances having jurisdiction and specified codes shall serve as minimum requirements; but, if the contract documents indicate requirements which are in excess of those minimum requirements then the requirements of the contract documents shall be followed. Should there be any conflicts between the contract documents and codes, or any ordinances, report these with bid. Determine the exact requirements for the utility service connections and metering facilities as set forth by the utilities that will serve the project, and pay for an perform all work as required by those utilities.

1.05 Standards: All materials and equipment shall conform to the requirements of the contract documents. They shall be new, free from defects, and they shall conform to the following standards

where these organizations have set standards:

Underwriters Laboratories, Inc. (UL)
National Electrical Manufacturer's Association (NEMA)
American National Standards Institute (ANSI)
Insulated Cable Engineers Association (ICEA)

All material and equipment, of the same class, shall be supplied by the same manufacturer unless specified to the contrary. All products shall bear UL labels where standards have been set for listing.

1.06 Shop Drawings and Submittals: Shop drawings shall be taken to mean detailed drawings with dimensions, schedules, weights, capacities, installation details and pertinent information that will be needed to describe the material or equipment in detail. Submittals shall be taken to mean catalog cuts, general descriptive information, catalog numbers and manufacturer's name.

Submit six copies for review within sixty (60) days after notice to proceed, all shop drawings and submittals as hereinafter called for. If shop drawings and submittals are not received in sixty (60) days, the Owner's representative reserves the right to go directly to the manufacturer for the information and any expense incurred shall be borne by the Contractor.

Review of submittals or shop drawings shall not remove the responsibility for furnishing materials or equipment of proper dimensions, quantity and quality; nor will such review remove responsibility for errors in shop drawings or submittals.

Failure to process submittals or shop drawings on any item and/or items specified shall make the Contractor responsible for suitability of the item and/or items, even though the item and/or items installed appear to comply with the contract.

The Contractor assumes all costs and liabilities which may result from the ordering of any material or equipment prior to the review of the shop drawings or submittals, and no work shall be done until the shop drawings or submittals have been reviewed. In case of correction or rejection, resubmit until such time as they are accepted by the Owner's representative and such procedures will not be cause for delay. After final review, supply up to six (6) copies, if requested.

Submittals and shop drawings shall be compiled from the manufacturer's latest product data. Should there be any conflicts between this data and the contract documents, report this information for each submittal and/or shop drawing. Shop drawings and submittals will be returned unchecked if the specific items proposed are not clearly marked, or if the general's approval stamp is omitted.

When requested, furnish samples of materials for acceptance review. If a sample has been reviewed and accepted, then that item of material or equipment installed on the job shall be equal in quality to the sample; if it is found that the installed item is not equal then replace all such items with the accepted sample equivalent. Materials to be submitted are as follows:

1. Motor Controllers
2. Disconnect Switches
3. Lighting Fixtures
4. Wire
5. Conduit and Fittings
6. Heat Trace Equipment

7. Wiring Devices
8. Level Transmitters
10. Control System

1.07 Acceptance and Substitutions: All manufacturers named are a basis as a standard of quality and substitutions of any equal product will be considered for acceptance. The judgment of equality of product substitution shall be made by the Engineer. Substitutions after award of contract shall be made only within sixty (60) days after the notice to proceed. Furnish all required supporting data. The submittal of substitutions for review shall not be cause for time extensions. Where substitutions are offered, the substituted product shall meet the product performance as set forth in the specified manufacturer's current catalog literature, as well as meeting the details of the contract documents.

The details on the drawings and the requirements of the specifications are based on the first listed item of material or equipment; if any other than the first listed material or equipment is furnished, then assume responsibility for the correct function, operation, and accommodation of the substituted item. In the event of misfits or changes in work required, either in this section or other sections of the contract, or in both, bear all costs in connection with all changes arising out of the use of other than the first listed item specified.

2.01 Excavation and Backfilling: The Contractor shall do all excavating and backfilling necessary for the installation of the work. This shall include shoring and pumping in ditches to keep them dry until the work in question has been installed. All shoring required to protect the excavation and safeguard employees shall be properly performed. All excavations shall be made to the proper depth, with allowances made for floors, forms, beams, piping, finished grades, etc. Ground under conduits shall be well compacted before conduits are installed. All backfilling shall be made with selected soil; free of rocks and debris and shall be pneumatically tamped in six inch (6") layers to secure a field density ratio of 90%. All excavated material not suitable and not used in the backfill shall be removed offsite at the Contractor's expense.

The Contractor shall field check and verify the locations of all underground utilities prior to any excavating. Avoid disturbing these as far as possible. In the event existing utilities are broken into or damaged, they shall be repaired so as to make their operation equal to that before the trenching was started.

Where the excavation requires the opening of existing walks, drives, or other existing pavement, these facilities shall be cut as required to install new lines and to make connections to existing lines. The sizes of the cut shall be held to a minimum consistent with the work to be installed. After installation of new work is completed and the excavation has been backfilled in accordance with above, repair existing walks, drives or other existing pavement to match existing installation.

2.02 Cutting and Patching: Cutting and patching required under this section shall be done in a neat workmanlike manner. Cutting lines shall be uniform and smooth. Concrete saws shall be used for large cuts in concrete and use core drills for small round cuts in concrete. Where openings are cut through masonry walls, provide lintel or other structural supports to protect the remaining masonry. Adequate support shall be provided during the cutting operation to prevent damage to masonry. Where large openings are cut through metal surfaces, attach metal angles around the opening. Concrete openings that are to be patched shall be filled with non-shrinking cementing compound. Finished concrete patching shall be troweled smooth and shall be uniform with surrounding surfaces.

2.03 Waterproofing: Provide waterproof flashing for each penetration of exterior walls and roof.

Flashing for conduit penetrations through built-up roofs shall be made with pitch pans filled with pitch. Conduit penetrations through poured concrete roofs shall be made with sleeves and annulus caulked. Penetrations through walls at below ground elevations shall be waterproofed by conduit sealing fittings or other methods as indicated. Interiors of raceways that are likely to have water ingress such as runs from hand-holes into below-grade installations shall have waterstops installed to prevent water from entering into installations.

2.04 Equipment Protection: The contractor shall provide suitable protection for all equipment, work and property against damage during construction and shall assume full responsibility for material and equipment stored at the site. Conduit openings shall be closed with caps or plugs during installation. All outlet boxes and cabinets shall be kept free of concrete, plaster, dirt, and debris. Equipment shall be covered and tightly sealed against entrance of dust, dirt, and moisture.

2.05 Clean-up: The Contractor shall remove all temporary labels, dirt, paint, grease and stains from all exposed equipment. Upon completion of work, clean equipment and the entire installation so as to present a first class job suitable for occupancy. No loose parts or scraps or equipment shall be left on the premises. Equipment paint scars shall be repaired with paint kits supplied by the equipment manufacturer, or with an approved paint. At completion of work all equipment interiors shall be free from dust, dirt, and debris.

2.06 Tests: All equipment shall be put through a trial run-in test to ascertain the performance complies with the intent of the specifications. All run-in tests shall be made in the presence of the Engineer.

3.01 Record Drawings: At the start and during the progress of the job, keep one separate set of blueline prints for making construction notes and mark-ups. Conduit routing and wiring runs shall be shown as constructed with each identified. All deviations from the contract documents shall be noted. A set of marked-up drawings shall be submitted for review.

3.02 Operations and Maintenance Manuals: Six (6) weeks prior to the completion of the project, compile an operations and maintenance manual on each item of equipment. These manuals shall include detailed instructions and maintenance, as well as spare parts lists. Submit six (6) copies for review.

4.01 PRODUCTS:

A. Raceways

1. Above ground conduit shall be hot dipped galvanized rigid steel and shall comply with ANSI C90.1, Federal Specification UWC-S81-D and UL Standard UL-6.

2. Below grade conduit and interior of laboratory and chemical rooms shall be non-metallic rigid PVC Schedule 40, rated 90°C and conform to NEMA TC-2 and UL-651 standards. Transitions to above ground to be made with PVC coated rigid metallic same as above.

3. Connections to motors shall be made using liquid tight flexible conduit and shall consist of galvanized flexible interlocking steel core with thermoplastic cover.

B. Conduit Fittings

1. NEMA 1 locknuts for indoor rigid metallic conduit shall be galvanized steel.

2. Outdoor field applied hubs for sheet metal enclosures shall be galvanized steel ring, nylon throat, threaded NPT insert and shall be MYERS "SCRU-TITE", or equal.

3. Conduit hubs for non-metallic enclosures shall be fiberglass polyester reinforced with galvanized steel core, complete with locknut and grounding bushing and shall be Square D Type NH, or equal.

4. Rigid metallic conduit chase nipples, slip fittings, unions, reducers shall be hot dipped galvanized steel.

5. Rigid metallic conduit grounding bushings shall be hot dipped galvanized steel with threaded hub, nylon insulated throat, and ground lug.

6. Liquid tight flexible conduit fittings shall be hot dipped galvanized steel body with internal locking ring.

C. Conduit Bodies and Boxes

1. Conduit bodies such as "C", "LB", "T" and the like pulling fittings shall be zinc coated with sand-cast malleable iron. Covers shall be gasketed cast metal with stainless steel cover screws and clamp style attachment. Furnish Crouse-Hinds Form 7, or equal.

2. Conduit bodies such as "GUA", "GUAT", "GUAL", and the like pulling/splicing fittings shall be zinc coated malleable iron with threaded cast metal zinc coated covers. All such conduit bodies shall be Crouse-Hinds GU/EA series, Appleton "GR" series, or equal.

3. Cast metal outlet boxes, pull boxes, and junction boxes whose volume is smaller than 100 cubic inches, and cast metal device boxes, shall be zinc coated sand-cast malleable iron. All boxes shall have threaded hubs. Furnish Crouse-Hinds "FD" style Condulets, Appleton "FD" style Unilets, or equal.

4. Covers for cast metal boxes shall be gasketed cast metal covers with stainless steel screws.

D. Wire and Cable

1. All conductors shall be soft-drawn, stranded annealed copper that meets ANSI 44, ASTM B3-74/38-72.

2. Insulation for all 480V conductors in sizes larger than #3/0 AWG shall be insulated with ethylene propylene rubber and shall have chlorosulfonated flame retardant outer jacket. All such wire shall be type RHH, RHW, USE, VW-1. Furnish Okonite "Okolon", Rockbestos "Firewall", or equal.

3. Insulation for all 480V conductors in sizes #3/0 AWG and smaller shall be cross-linked polyethylene. Furnish type RHH, RHW, USE wire, Okonite "X-Olene", G.E. "Vulkene", or equal.

4. All power signal-conductor cables shall be factory pigmented black insulation.

5. Insulation for all 120/240V conductors, insulated equipment grounding conductors and control conductors shall be cross-linked polyethylene. Furnish type XHHW wire, Okonite "X-Olene", G.E. "Vulkene", or equal.

6. Multiconductor shielded cables shall be polyethylene insulated tinned copper conductors within an aluminum-polyester shield tinned copper drain wire and a chrome PVC jacket. Shield shall provide 100% coverage. Cables shall be UL style 2092 and shall be Belden Beldfoil #8760, or equal, with number of conductors shown.

7. Multiconductor signal cables shall consist of pairs of insulated copper conductors, size and number of pairs as indicated cabled together using polyethylene filler cords where necessary. The cabled assembly shall be wrapped with a clear polyester tape. The integral supporting messenger shall be 1/4" (7 strand) class A galvanized extra high strength steel with a minimum breaking strain of 6650 lbs. The messenger shall be flooded with a rubber-asphalt compound for corrosion protection and shall comply with sections 10 and 11 of IMSA specifications 19-3 or 20-3. Overall jacket shall have a black sunlight resistant overall jacket. The cable core and messenger shall be assembled to form a figure 8 construction.

E. Connectors

1. Mechanical connectors shall be copper alloy bolted pressure type with bronze hardware.

2. Insulated spring-wire connectors, "wire-nuts", for small building wire taps and splices shall be plated spring steel with thermoplastic jacket. Connector shall be rated at 150°C continuous. Furnish 3M "Hyflex", T&B "PT", or equal.

3. Insulated set-screw connectors shall consist of copper body with flame-retardant plastic insulated shield. Furnish Ideal, T&B, or equal.

4. Connectors for control conductor connections to screw terminals shall be crimp-type with vinyl insulated barrel and tin-plated copper ring-tongue style connector. Furnish T&B "Sta-kon", 3M "Scotchlok", or equal.

F. Insulating Products

1. Tape products shall be furnished as hereinafter specified and shall be Plymouth, Okonite, F.E., 3M, or equal.

2. General purpose electrical tape shall be 7 mil thick stretchable vinyl plastic, pressure adhesive type, "Slipknot Grey", 3M Scotch 33+, or equal.

3. Insulating void-filling tape and high voltage bedding tape shall be stretchable ethylene propylene rubber with high-tack and fast fusing surfaces. Tape shall be rated for 90°C continuous, 130°C overload, and shall be moisture-proof. Void-filling tape shall be "plysafe", 3M Scotch 23, or equal.

4. High temperature protective tape shall be rated 180°C continuous indoor/outdoor, stretchable, self-bonding silicone rubber. High temperature tape shall be "Plysil #3455", 3M Scotch 70, or equal.

5. Insulation putty filler-tape shall be Plymouth #2074; 3M, or equal.

G. Labels

1. Colored banding tape shall be 5 mil stretchable vinyl with permanent solid color. Colors shall be as hereinafter specified. Tape shall be Plymouth "Slipknot 45", 3M Scotch #35, or equal.

2. Numbered marking labels shall be colored vinyl markers, T&B, Brady, or equal.

3. Cable identification labels shall be weather resistant polyester with blank write-on space, T&B, Brady, or equal.

4. Buried conduit marking tape for marking path or buried conduits shall be four inch (4") nominal width strip of polyethylene with highly visible, repetitive marking "BURIED CONDUIT", or similar language, along its length.

5. Nameplates shall be micarta lamicoid material, 1/6" thick, black background with white engraving. Attachment means shall be self-tapping stainless steel screws.

H. Grounding Devices

1. Exothermally welded joints shall be made with Enrico "Cadweld", Burndy "Thermweld", or equal kits.

2. Ground bus connectors shall be Square D type "LU", OZ Type "XLH", or equal.

3. Conduit grounding bushings shall be as specified under CONDUIT FITTINGS.

I. Supporting Devices

1. Mounting hardware, nuts, bolts, lock washers, and washers, shall be grade 304 stainless steel.

2. Unless otherwise indicated, slotted channel framing and supporting devices shall be manufactured of ASTM 6063, T-6 grade aluminum; 1-5/8" wide x 3/14" deep (double opening type). Clamp nuts for use with slotted channels shall be grade 304 stainless steel.

3. Conduit straps for use with slotted channels shall be aluminum with stainless steel hardware.

4. After-set concrete inserts shall consist of stainless steel expansion bolts, 1/4" minimum diameter, 500 lbs. minimum pull-out resistance. Furnish Phillips, Wej-it, or equal.

5. Hanger rod shall be 3/8" minimum diameter galvanized steel all-thread.

6. Nest-back or clamp-back conduit supports shall be two-piece hot-dipped galvanized malleable iron devices. Furnish Crouse-Hinds "MW + CB", Gedney 140 series, or equal.

7. One-hole conduit clamps shall be hot-dipped galvanized malleable iron type, Crouse-Hinds type "MW", T&B 1270/1280 series, or equal.

8. Conduit "U" bolts shall be hot-dipped galvanized steel with galvanized hex-head bolts.

9. Plastic saddles for supporting buried conduits shall be interlocking type that provides separation between conduits vertically and laterally and between bottom of conduits and trench floor.

J. Miscellaneous Material

1. Double bushings for insulating wiring through sheet metal panels shall consist of mating male and female threaded phenolic bushings. Phenolic insulation shall be high-impact "ABB", Gedney type "ABB", or equal.

2. Cable grips shall be grip-type wire mesh with machined metal support. Furnish Kellems, Appleton, or equal products.

3. Conduit pull-cords for use in empty raceways shall be glass-fiber reinforced tape with foot-marked along its length. Furnish Thomas, Greenlee, or equal products.

4. Conduit thread coating compound shall be conductive, non-galling, and corrosion-inhibiting. Furnish Crouse-Hinds type "STL", Appleton type "ST", or equal.

5. Wire pulling compound shall be non-injurious to insulation and to conduit and shall be lubricating, non-crumbling, and non-combustible. Furnish Gedney "Wire-Quick", Ideal "Yellow", or equal.

6. Plastic compound for field-coating of ferrous material products shall be PVC in liquid form that sets-up semi-hard upon curing. Furnish Rob Roy "Rob Kote", Sedco "Patch Coat", or equal.

7. Zinc spray for coating electrogalvanized steel products shall be Research Laboratory type "LPS", Mobil "Zinc-spray", or equal.

8. Splicing kit shall be provided with insulating and sealing compound to provide a moisture-tight splice. Provide Scotchcast Series 82 or equal splicing kit.

K. Lighting

1. Fixture lamps shall be furnished as scheduled and as specified.

2. Each fixture shall be complete with its appropriate hardware, finish trim, and

appurtenances as required for a finished installation.

L. Wiring Devices

1. All wiring devices shall be specification grade and shall meet NEMA WD 1-1971 requirements. Furnish following types unless otherwise indicated.

2. Two-pole, 3-wire grounding, 15A/125V, NEMA 5-15R duplex receptacle shall be Arrow-Hart #5662-S, Hubbell #5262, or equal.

3. Two-pole, 3-wire grounding, 20A/125V, NEMA 5-20R duplex receptacle shall be Arrow-Hart #5739-S, Hubbell #5362, or equal.

4. GFCI receptacle shall be single receptacle in a duplex body with upper half containing reset and test pushbuttons. Furnish Square D "GFSR", or equal.

5. Two-pole, 3-wire grounding, #20A/250V, NEMA 6-20R single receptacle shall be Arrow-Hart #5861, Hubbell #5461, or equal.

6. Single-pole, single throw, 20A toggle switch shall be Arrow-Hart #1791, Hubbell #1221, or equal.

7. Single-pole, double throw (three-way) 20A toggle switch shall be Arrow-Hart #1993, Hubbell #1223, or equal.

8. Double-pole, double-throw (four-way) 20A toggle switch shall be Arrow-Hart #1994, Hubbell #1224, or equal.

9. Double-pole, single-throw 29A toggle switch shall be Arrow-Hart #1992, Hubbell #1222, or equal.

10. Single-pole, double-throw, momentary/ centeroff, 20A toggle switch shall be Arrow-Hart #1995, Hubbell #1556, or equal.

11. Door switch, single-throw pressure sensitive shall be Pass & Seymore #1205, or equal.

M. Panelboards

1. Panelboards shall have voltage, overcurrent devices and features as indicated.

2. Breakers shall be plug-on type, trip-free. Multipole breakers shall be provided with a common internal trip which opens all poles simultaneously and with a single operating handle for all poles. Handle ties between breakers are not acceptable.

3. Breakers for 480V distribution panels shall be rated at least 14,000 amps I.C., and breakers for 120/240V panels shall be rated at least 10,000 amps I.C.

4. Provide ground bus inside each cabinet.

5. Enclosures shall be NEMA 1 surface mounted cabinet with gasketed, hinged door, inside gutter trim and with door mounted directory pocket. All metal surfaces shall be painted with baked-on acrylic enamel.

N. Dry-Type Transformers

1. Dry-type transformers shall have continuous KVA and voltage characteristics as shown.

2. Enclosures shall be indoor type.

3. Coils shall be provided with NEMA standard taps in high voltage windings.

4. Furnish Square D or equal dry-type transformers.

O. Safety Switches

1. Safety switches shall be fused or non-fused as indicated. Each fused type switch shall be equipped with class R rejection clips.

2. Switch mechanism in each safety switch shall be quick-make, quick-break, heavy-duty type that meets Federal Specification W-S-865C.

3. Enclosures shall be NEMA types as indicated. NEMA 4X types shall be fiberglass reinforced polyester with gasketed door and stainless steel hardware.

4. Conduit hubs for NEMA 4X enclosed safety switches shall be steel body type with fiberglass reinforced polyester covering and with grounding bushing inside.

5. Conduit hubs for NEMA 3 and NEMA 4 enclosures shall be water-tight threaded hubs with grounding bushing inside.

6. Each enclosure shall be equipped with ground lug.

7. Where indicated furnish disconnect mechanism with auxiliary control disconnect contact rated 10 amp make, 6 amp break 120V A.C., 35% p.f.

8. Where indicated furnish NEMA 4X safety switches with integrally mounted pilot operators.

9. NEMA 1, 3, 4 or 12 enclosed safety switches shall be Square D, or equal.

10. NEMA 4X safety switches shall be Square D "Krydon", or equal.

P. Motor Controllers

1. Enclosures shall be NEMA types as indicated. NEMA 4X types shall be fiberglass reinforced polyester with gasketed door and stainless steel hardware.

2. Each motor controller shall be as follows:

a. All motor controllers shall be full-voltage, non-reversing type except where other types are indicated. Contactors and overcurrent devices and conductors shown shall be minimum sizes, confirm all external loads prior to manufacture.

b. Each controller shall have a hinged door. Disconnect device operating handles shall have on-off positions clearly marked and each handle shall have padlocking provisions. Controller doors shall have mechanical interlocks to prevent their being opened unless the disconnect is in the "off" position; however, there shall be a defeat mechanism for authorized personnel entry.

c. Each controller shall be equipped with its own fuses and control power transformer. VA capacity of control power transformer shall be sized to handle its compartment load plus external connected loads.

d. Each controller shall be equipped with pull apart terminal blocks.

e. Each controller shall be equipped with indicated pilot operators and other devices. All pilot operators such as pilot lights, selector switches, and pushbuttons shall be oil-tight grade. Each device shall be equipped with engraved metal surround legend with functions engraved.

f. Provide one ambient-compensated overload for each motor controller. Size five and larger contactors shall have overloads fed from CT's in motor leads. Overload blocks shall be adjustable from 80% to 115% of their nominal value. Where indicated, provide overloads with auxiliary contacts. Selection of overloads shall be determined by the full load current of motor to be supplied.

g. All control relays shall be industrial type each with 10 amp, 120V rated contacts. Each contact shall be field convertible. Each relay shall have open-close position indication. Relay coils shall be rated 120VAC continuous duty, including latch type relay coils.

h. Motor branch circuit overcurrent protection shall be motor circuit protectors, unless otherwise indicated. Each "MCP" shall have adjustable current setting pickup. Minimum I.C. of each "MCP" shall be 22KA rms symmetrical amps.

5.01 INSTALLATION: The following methods shall be used on this project:

5.02 Raceways:

A. Install the conduit system to provide the facility with the utmost degree of reliability and maintenance-free operation. The conduit system shall have the appearance of having been installed by competent workmen. Kinked conduit, conduit inadequately supported or carelessly installed, do not give such reliability and maintenance-free operation and will not be acceptable.

B. Raceways shall be installed for all wiring runs except as otherwise indicated.

C. Conduit sizes, where not indicated, shall be N.E.C. code-sized to accommodate the number and diameter of wires to be pulled into the conduit. Unless otherwise indicated, 3/4" trade-size shall be minimum size conduit.

D. Unless otherwise noted, conduit runs shall be installed exposed. Such runs shall be made parallel to the lines of the structure.

E. Unless otherwise indicated, conduit runs installed below-grade in earth shall be PVC. Use manufacturer's approved cement for joining couplings and adapters. Runs shall be installed so that tops of conduits are at least twenty-four inches (24") below finished grade. Support runs on plastic spacers and backfill to three inches (3") above topmost conduits with washed sand. Wash down all sand backfill with water so as to completely fill interstices and to compact sand. Complete backfill to finished grade with selected soil that is free from clods, debris, rocks and the like. Pneumatically tamp backfill in six inches (6") to eight inches (8") below finished grade, install continuous run of "BURIED CABLE" marking tape.

F. Below-grade to above-grade upturns in non-metallic runs shall be made with plastic coated rigid metallic conduit. Install for each upturn a PVC male adaptor on each end of PVC run and thread into metallic coupling that shall be equipped with a PVC sleeve. Continue thence with plastic coated metallic conduit to at least four inches (4") above finished grade.

G. Rigid metallic conduit runs shall have their couplings and connections made with screwed fittings and shall be made up wrench-tight. Check all threaded conduit joints prior to wire pull.

H. All conduit runs shall be water-tight over their lengths of run except where drain fittings are indicated. In which cases, install specified breather-drain fittings.

I. Plastic jacketed flexible steel conduit shall be used to connect wiring to motors, limit switches, bearing thermostats, and other devices that may have to be removed for servicing. Unless otherwise indicated, maximum lengths of flex shall be six feet (6').

J. Each flex connector shall be made up tightly so that the minimum pull-out resistance is at least 150 lbs.

K. Empty conduits shall have pull-tape installed. Identify each terminus as to location of other end. Use blank plastic waterproof write-on label and write information on each label with waterproof ink. Cap exposed ends of empty conduit with plastic caps.

L. Conduit runs into boxes, cabinets, and enclosures shall be set in a neat manner. Vertical runs shall be set plumb. Conduits set cocked or out of plumb will not be acceptable.

M. Conduit entrances into equipment shall be carefully planned. Cutting away of enclosure structure, torching out sill or braces, and removal of enclosure structural members, will not be acceptable.

N. Use approved hole cutting tools for entrances into sheet metal enclosures. Use of cutting torch or incorrect tools will not be acceptable. Holes shall be cleanly cut and they shall be

free from burrs, jagged edges, and torn metal.

O. All raceways shall be swabbed clean after installation. There shall be no debris left inside. All interior surfaces shall be smooth and free from burrs and defects that would injure wire insulation.

5.03 Conduit Bodies and Boxes:

A. Conduit bodies such as "LB", "T", etc., shall be installed in exposed runs of conduit wherever indicated and where required to overcome obstructions and to provide pulling access to wiring. Covers for such fittings shall be accessible and unobstructed by the adjacent construction.

B. Covers for conduit bodies installed shall be gasketed cast metal type.

C. All conduit boxes installed shall be cast metal type. Covers for all such boxes shall be gasketed cast metal type.

5.04 Raceway Support:

A. All raceway systems shall be adequately and safely supported. Loose, sloppy and inadequately supported raceways will not be acceptable. Supports shall be installed at intervals not greater than those set forth under Article 300 of N.E.C., unless shorter intervals are otherwise indicated, or unless conditions require shorter intervals of supports.

B. Surface mounted runs of conduit on concrete or masonry surfaces shall be supported off the surface by means of aluminum slotted channels and conduit clamps. Attach each slotted channel support to concrete surface by means of two (2) 1/4" diameter stainless steel bolts into drilled expansion shields.

C. Conduit runs that are installed along metallic structures shall be supported by means of beam clamps or other methods as may be indicated. Coat each clamp with PVC prior to installation.

D. Below-grade conduits shall be supported with plastic saddles.

5.05 Wiring:

A. Conductors shall be sized as shown and where no size is indicated, the conductor size shall be #12 AWG.

B. All control wiring, 120/240V wiring and insulated equipment grounding conductors shall be type XHHW insulated stranded copper conductors.

C. All 480V wiring in sizes #4/0 and larger shall be made with type RHH, RH, USE, VW-1 wire with stranded copper conductors that has EPR insulation and flame retardant jacket.

D. All 480V wiring in sizes smaller than #4/0 shall be installed with type RHH, RHW, USE insulated stranded copper conductors.

E. Branch circuits may be spliced for receptacle, lighting and small appliances load inside appropriate junction boxes.

F. Except as otherwise specified, taps and splices with #10 AWG and smaller shall be made with insulated spring wire connectors. Such connectors in damp or wet locations shall be further insulated with an envelope of stretched piece of EPR tape around each wire to fill the interstices between the wires. Then, apply one-half lapped layer of electrical tape over all.

G. Motor connections made with #10 AWG and smaller wire shall be made up with set-screwed copper lugs with threaded-on insulating jacket. After make-up of each connector, install two (2) layers half-lapped, of high temperature tape over connector barrel and down over wires into connector one inch (1").

H. Motor connections made with #8 AWG and larger wire shall be made up with cast copper alloy splice connector. Apply over each connector and down 1.5 inches over each wire entry, wrapping if high temperature tape. Apply at least three (3) layers, half-lapped each layer of such tape with maximum build-up over the connector. Then apply final wrapping of at least three (3) layers, half-lapped each layer of electrical tape.

I. Taps, splices, and connections in #8 AWG and larger wires shall be made with copper alloy bolted pressure connectors. Each such connector shall be insulated by means of applying insulation putty over sharp edges so as to present a smooth bonding surface. Next, apply at least four (4) layers, half-lapped each layer of EPR tape. Then make final wrapping of at least three (3) layers, half-lapped each layer of electrical tape.

J. Control wiring connections to stud type and screw type terminals shall be made with ring-tongue type crimp connectors. Label each terminal jacket with wire marking label at each connection.

K. Each wire connection shall be made up tightly so that resistance of connection is as low as equivalent length of associated conductor resistance.

L. Phase label black pigmented power wires with color banding tape. Color of tape applied shall be that specified below.

Conductor	120/240V Systems	480V Systems
Phase A	Black	Purple
Phase B	Red	Brown
Phase C	Blue	Yellow
Neutral	White	Gray
Equipment Ground	Green	Green

M. Numbered marking labels shall be installed to identify circuit numbers from panelboards. Install labels on each wire in each panelboard, junction, and pull box, and device connection.

N. Label each wiring run with write-on waterproof labels inside each motor control center and in service switchboard. Install write-on label ties around wire group at conduit entrance and

write-on label the wire size, and service.

O. Install numbered marking on each control wiring termination at each terminal strip and at each device. Do this in motor control center, terminal cabinets, safety switches, remote controllers, pilot operators, and instrumentation equipment. Number selected shall correspond to number on terminal strip.

P. All wiring inside enclosures will be neatly trained and laced with nylon tie-wraps.

Q. All wiring shall be installed in raceways unless otherwise noted; however, no wire shall be drawn into a conduit until all work of a nature which may cause injury is completed. Do not exceed wire and cable manufacturer's recommended pulling tensions. A cable pulling compound shall be used as a lubricant and its composition shall not affect the conductor or its insulation.

5.06 Wiring Devices:

A. Install wiring devices where indicated. Wiring devices shall be type as indicated.

B. Each wiring device shall be set with axis plumb and installed with yoke screws so as to adequately support device yokes to the box.

C. Device boxes shall be cast metal Condulets or equal.

D. Use ganged boxes for ganged devices.

E. Each device box shall be equipped with specified cast metal cover.

5.07 Grounding:

A. Each item of equipment shall be adequately and thoroughly grounded. Comply with Article 250 of N.E.C., except where higher standards of grounding have been specified.

B. Equipment grounding conductors (EGC) shall be installed where indicated. These wires shall be green colored in sized #6 AWG and smaller and green banded in larger sizes.

C. EGC runs into equipment and shall be grounded to equipment bus where available, or to equipment ground lugs.

D. Where grounding type bushings are installed, bond EGC thereto and furthermore ground each bushing lug to equipment ground bus or ground lug, or ground rod.

E. In each motor terminal box, install equipment ground lug and connect EGC thereto.

F. In each floodlight pole, install ground connector to pole and bond to conduit bushing and to EGC in branch circuit.

5.07 Outdoor Lighting Fixtures:

A. Install anchor bolts with templates. Each anchor bolt shall be set plumb and have correct

projection above top of concrete to accommodate double nuts and base so that there shall be slight projection of each bolt above top nut when top nut is fully seated.

B. Each pole shall be set so that after tightening the nuts on the anchor bolts, they shall be plumb.

C. Conduit upcomers into pole bases shall be extended up to hand-hole level. Each conduit shall be equipped with grounding bushing. Bond each bushing lug to pole ground lug.

D. Pole riser wiring shall be made with 600V rated 3-conductor SO cord. Ground green equipment grounding conductor to pole ground lug at base and ground to luminaire at top.

E. Aim floodlighting luminaires at night for maximum coverage. Results shall be acceptable to the Engineer.

5.08 Labeling: In addition to requirements for labeling as specified throughout this section, install labels as follows:

A. Phase bank each power wire and cable with colored banding tape. do this at each termination.

B. Apply numbered wire marking labels to control wires, power wiring in panelboards, pull and junction boxes, and at outlets to identify circuit numbers. Each control wire shall be labeled at each connection.

C. Apply write-on identification labels to wiring sets in each hand-hole to identify function. Use waterproof labels.

D. Apply write-on identification labels to empty conduits to identify each with information as to terminus of other end and also trade size of conduit.

E. Install micarta nameplates with engraving to identify function and/or load served for the following:

1. Starters
2. Overcurrent Devices
3. Safety Switches
4. Panelboards
5. Motor Controllers
6. RTU's
7. Level Transmitters
8. Flow Switches
9. Heat Trace Equipment

Micarta nameplates shall be attached with stainless steel screws, use two (2) per each nameplate. Submit for review a schedule for engraving along with size for each proposed micarta nameplate. Do not fabricate nameplate until review has been completed.

6.01 Electrical Service: The Contractor will make arrangements with the Electric Utility Company to locate and provide 3-phase overhead power service at the water plant site. The Owner will pay for

all fees charged directly by the Electric Utility Company for equipment and labor supplied to provide such service. The Contractor shall schedule his work around such service availability.

7.01 Guarantee: All electrical and control equipment shall be guaranteed against defects in material and workmanship for a period of one (1) year from the date of system acceptance.

8.01 Payment: No separate payment for work performed under this item. Include cost of same in contract prices bid for all items of which this work is a component part.

ITEM NO. 7

LIQUID CHEMICAL FEED SYSTEM

1.01 Chlorination Building: NA

1.02 Chemical Feed Room Ventilation: Vents shall have bug screens and be of aluminum with adjustable damper or an FRP corrosion resistant shroud. All penetrations shall be sealed to prevent access by insects. The inlet vent opening shall be low on the opposite side as shown. The fan shall be controlled by exterior light switch.

1.03 Chemical Feed System: The Contractor shall provide and install a complete chemical feed system. The system shall/s shall consist of a Siemens Sitrans LUT 400 Series Ultrasonic Level Controller W/ an Echomax XRS-5 Ultrasonic Transmitter Upstream of the V Notch Weir on the Chlorine Contact Chamber. A Stenner variable speed, chemical feed pump Model Number SVP4H7 mounted on a shelf to inject solution into transfer line from clarifier to chlorine contact chamber. The Pump shall be flow paced based on 4-20 ma signal from ultrasonic flow meter with a spill recovery line directed back into the bulk storage tank. The Contractor shall provide all necessary piping and fittings to take suction from the proposed bulk storage tank and inject the solution into the treatment plant discharge before the ground storage tanks. A spare chemical feed pump shall be provided. The bulk storage tank shall be a 60 gallon Protank, Model # DWC 60, double wall tank with a quick connect with a Ball Valve located on the top for filling. Pump, tank, and all chemical feed system components shall be NSF 61 Approved for use in water systems. All Penetrations Shall Be Sealed to Prevent Access by Insects.

1.04 Chemical Feed Electrical: The electrical work shall comply with NEMA 1 requirements. All wire raceways shall be sealed PVC to prevent corrosion from the chlorine gas. Seal wyes shall be installed on all conduit entering the chemical room.

1.05 Payment: Payment for the materials, equipment, and labor furnished and installed under this specification shall be paid for under the Chemical Feed System Item

UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM

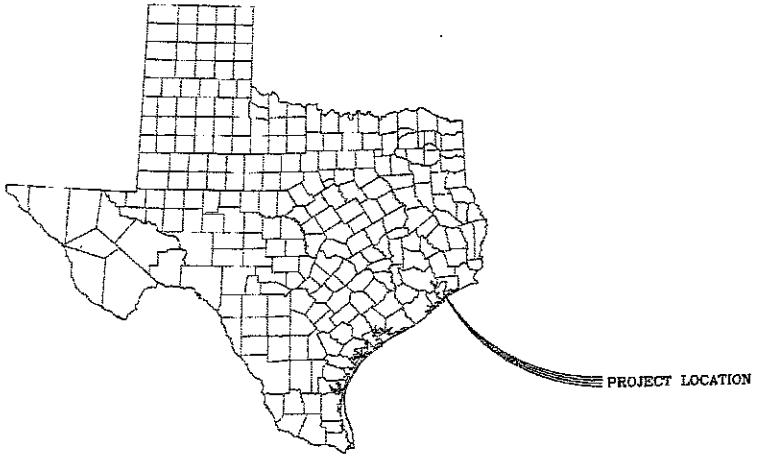
WASTEWATER PLANT IMPROVEMENTS

CHAMBERS CO., TEXAS

TPDES NO. WQ0013643001

GENERAL NOTES:

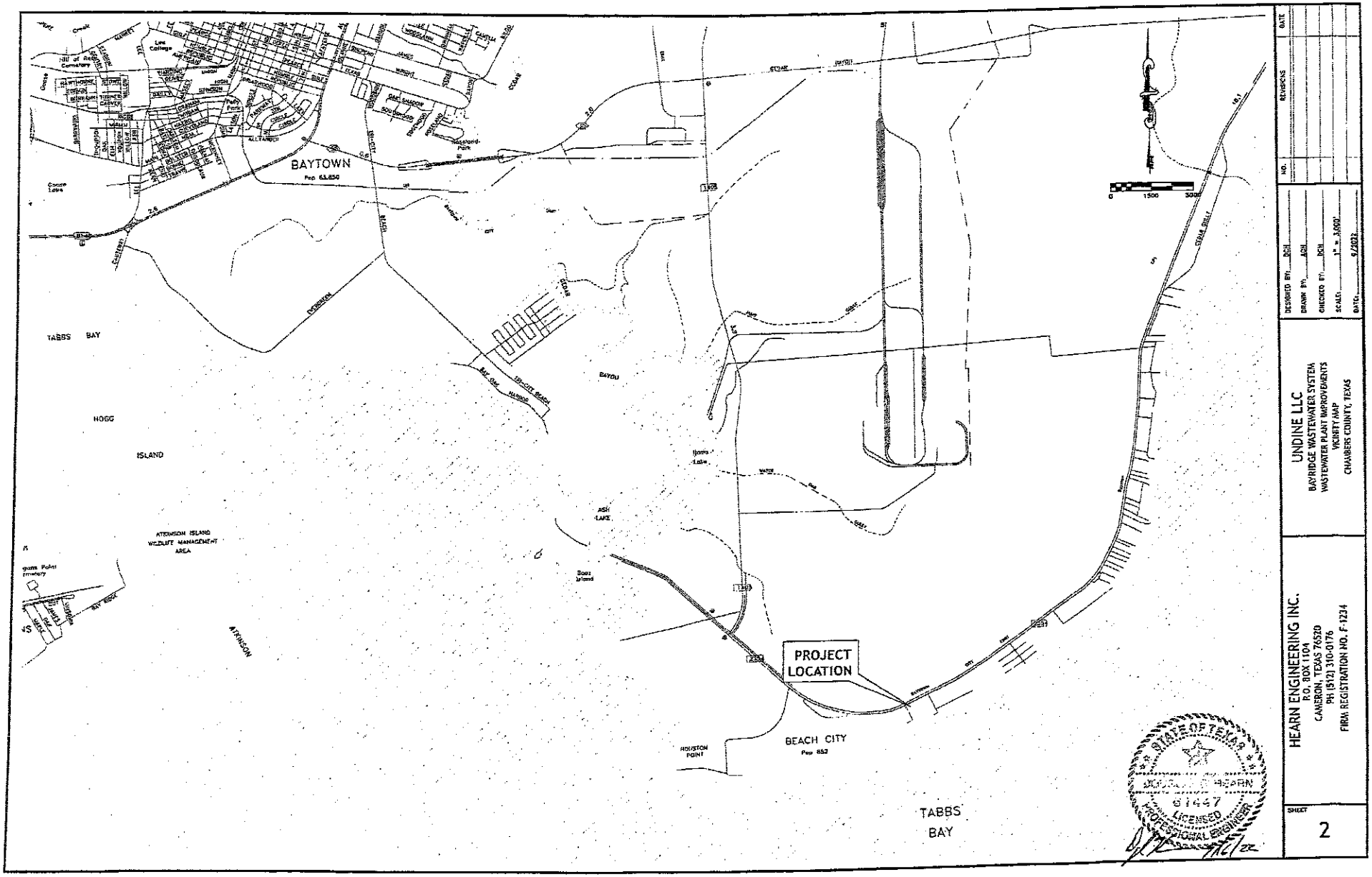
1. The contractor shall be liable for damage to improvements and utilities along the access route and at or near the worksite. Utilities may exist and not be shown on the construction drawings. The site shall be carefully scrutinized for evidence of utilities. As a minimum, prior to any ground disturbance, the number 811 shall be called to ascertain if underground utilities exist in the general work area. Calling the number will only confirm the existence of underground utilities owned by companies that subscribe to one of these organizations. There may be other underground utilities in the work area. The contractor shall notify the owners of all utilities a minimum of (10) days in advance of the intent to perform work in the affected area. The notice shall be in writing and a copy shall be furnished to the contracting officer.
2. All work shall be in accordance with TCEQ rules and regulations (chapter 290). All newly installed pipes and related products must conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI as required by 290.44(a)(1) of the rules. All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less as required in 290.44(a)(2) of the rules. Disinfection shall be in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service.
3. The contractor shall not attempt to determine locations by scaling from the plans. While every attempt has been made to prepare these plans to scale, the Engineer shall be consulted if clarifications are needed.
4. The contractor shall verify the location and elevations of all existing utilities prior to beginning constructed.
5. Conflicts with the proposed work shall be brought to the attention of the Engineer immediately.
6. The contractor shall notify the Engineer twenty-four (24) hours prior to beginning construction.
7. All underground fittings shall be mechanical joint restrained with Mega Lugs or other system approved by the Engineer. All above ground piping shall be flanged or threaded.
8. Proposed piping above ground shall be threaded schedule 40 G.I.P. up to 4" and schedule 40 fabricated steel or flanged D.I. for larger. All in ground piping shall be either schedule 40 G.I.P. or schedule 80 PVC.
9. Final grading shall insure proper drainage & be accomplished with top soil. once grading is completed, the area shall be revegetated with hydromulch which shall be maintained until there is a min. coverage of 90% with no area larger than ten square feet. All areas exposed construction shall be revegetated.
10. It is the intent of these plans and specifications that the contractor shall provide an installation that is complete. All items necessary, reasonably incidental or customarily included, shall be provided.



SHEET INDEX

HEARN ENGINEERING INC.
P.O. Box 1104 - Cameron, Texas 76520 - (512) 318-0176 - FIRM # F-1234

STATE OF TEXAS
D. HEARN
61447
LICENSED
PROFESSIONAL ENGINEER
7/16/12



NO.	REVISIONS	DATE

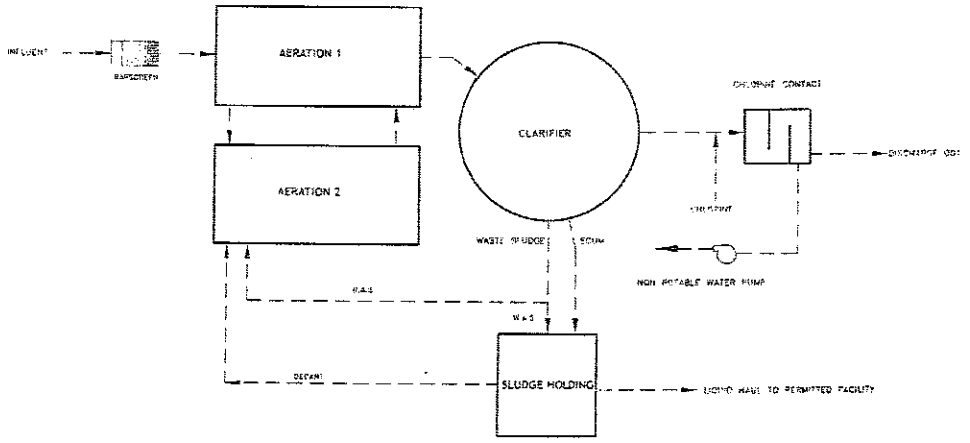
DESIGNED BY: BDH
DRAWN BY: ADH
CHECKED BY: BDH
SCALE: 1" = 3,000'
DATE: 5/2022

UNDINE LLC
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
VICINITY MAP
CHAMBERS COUNTY, TEXAS

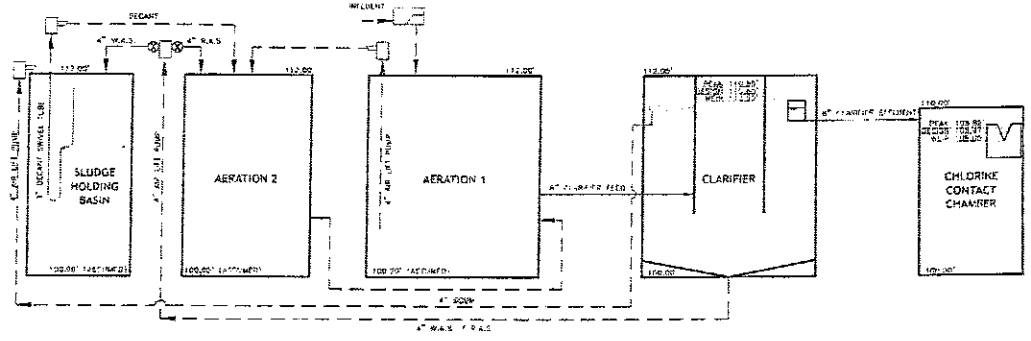
HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

STATE OF TEXAS
61447
LICENSED
PROFESSIONAL ENGINEER

SHEET
2



FLOW DIAGRAM



HYDRAULIC PROFILE

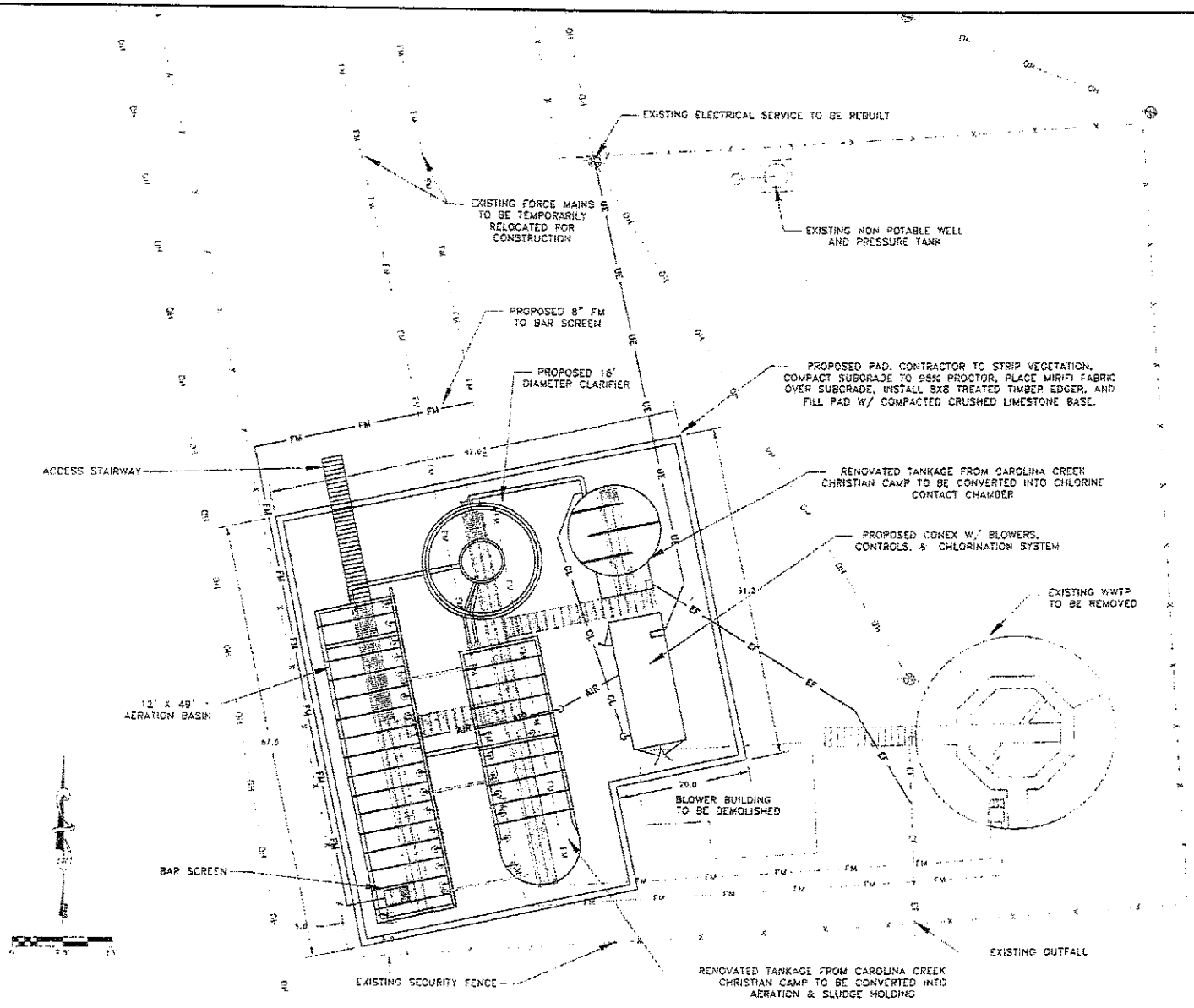
STATE OF TEXAS
PROFESSIONAL ENGINEER
9/16/22

DESIGNED BY: JDH
DRAWN BY: ACH
CHECKED BY: JDH
SCALE: N.T.S.
DATE: 9-2022

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
FLOW SCHEMATIC AND HYDRAULIC PROFILE
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

SHEET
3



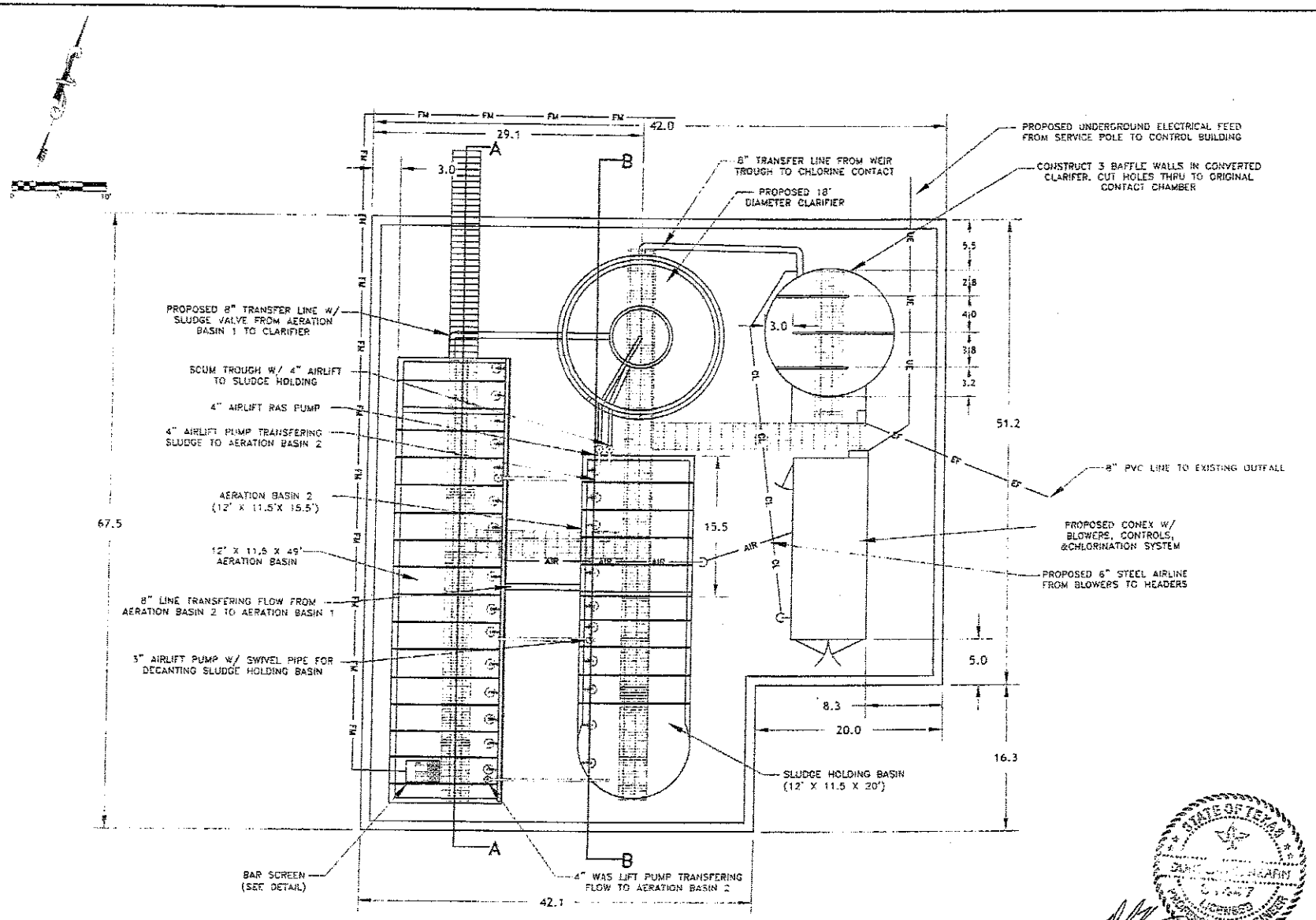
STATE OF TEXAS
REGISTERED
PROFESSIONAL ENGINEER
9/16/22

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 316-0176
FIRM REGISTRATION NO. F-1234

UNDINE, L.L.C.
BAINBRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT SITE PLAN
CHAMBERS COUNTY, TEXAS

DESIGNED BY: BDH
DRAWN BY: ASM
CHECKED BY: BJH
DATE: 9/2022

SHEET
4



HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

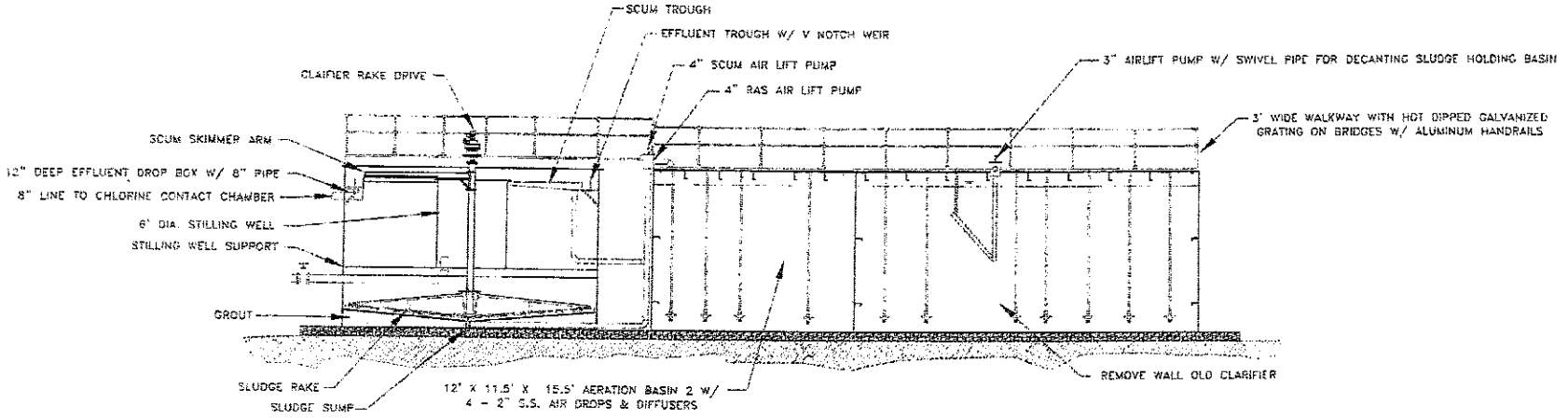
UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT LAYOUT
CHAMBERS COUNTY, TEXAS

DESIGNED BY: BDH
DRAWN BY: ACH
CHECKED BY: BDH
SCALE: 1" = 10'
DATE: 9/2022

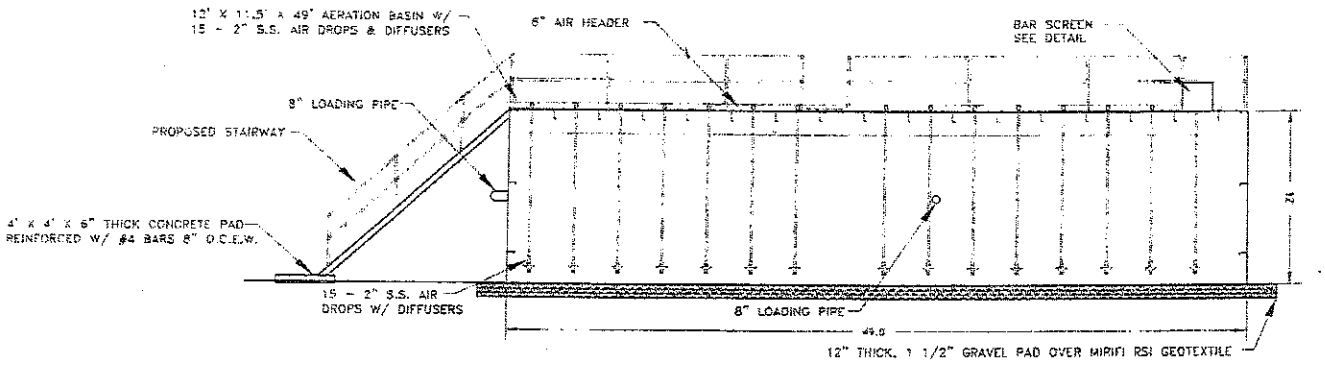
NO. | REVISIONS | DATE

STATE OF TEXAS
BRIAN D. HEARN
103647
LICENSED
PROFESSIONAL ENGINEER
9/16/22

SHEET
5



SECTION A – A



SECTION B – B

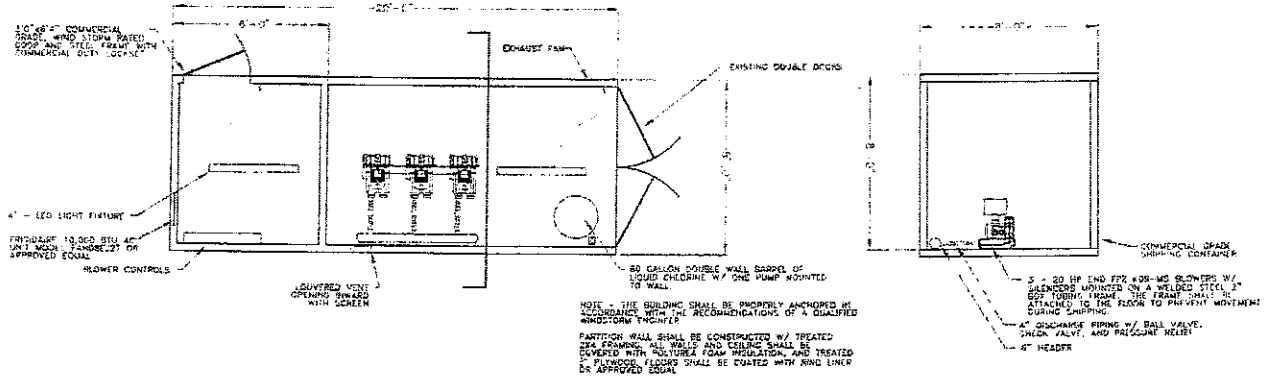
STATE OF TEXAS
SCOTT [illegible]
67647
LICENSED
PROFESSIONAL ENGINEER

9/16/12

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

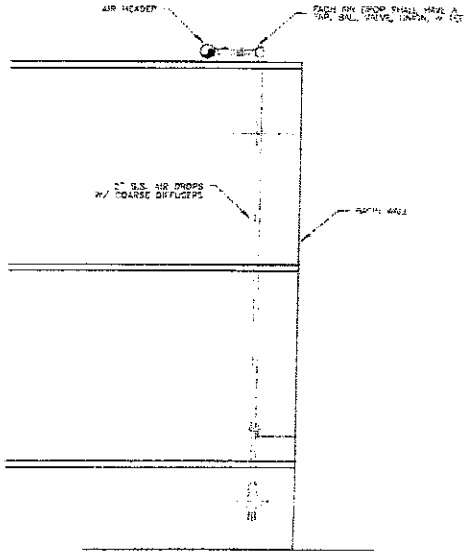
UNDINE, L.L.C.
BOLIVAR WASTEWATER SYSTEM
CRYSTAL PALACE WASTEWATER PLANT
SECTIONS
GALVESTON COUNTY, TEXAS

SHEET
6

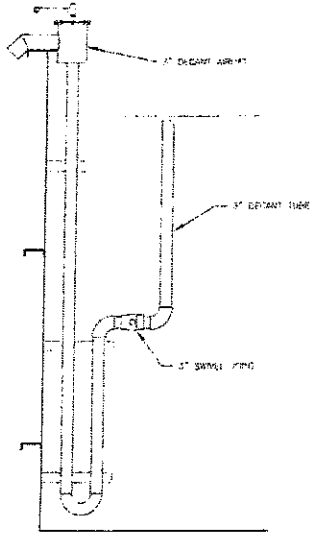


20' SHIPPING CONTAINER PLAN VIEW

SECTION VIEW



AIR DROP
SCALE 1"=3'



DECANT PIPING
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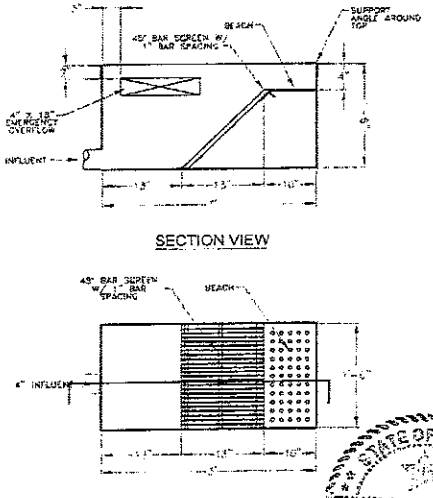


SECTION VIEW

PLAN VIEW

BAR SCREEN
NOT TO SCALE

STATE OF TEXAS
REGISTERED
PROFESSIONAL ENGINEER

NO.	REVISIONS	DATE
DESIGNED BY	DCH	
DRAWN BY	AFW	
CHECKED BY	DCH	
SCALE	AS NOTED	
DATE	9/2022	

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1164
CAMERON, TEXAS 76520
PH (512) 390-0176
FIRM REGISTRATION NO. F-234

SHEET 7

ELECTRICAL NOTES:

1. UNDERGROUND CONDUIT MAY BE PVC RIGID CONDUIT WITH 24" MIN. COVER WITH 2" RED CONC. CAP IN LIEU OF RIGID STEEL.

2. EXTERIOR ELECTRICAL ENCL. SHALL BE NEMA-3R OR NEMA 4 WEATHERPROOF.

3. WIRING AND CONDUIT SHOWN FOR GENERAL ARRANGEMENT ONLY. CONTRACTOR SHALL INSTALL ALL CONTROL PANELS, WIRING, AND CONDUIT REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING INSTALLATION IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND THE INTENT OF THE SPECS.

4. ALL CONDUCTORS SHALL BE COPPER. CONDUIT INSIDE PUMP BUILDINGS MAY BE SURFACE MOUNTED EMT. ALL ELECTRICAL WITHIN CHEMICAL ROOMS SHALL BE PVC SEALED TO PREVENT CORROSION FROM GAS. SEAL W/FS SHALL BE INSTALLED ON ALL CONDUIT RUNS LEAVING A CHEMICAL ROOM.

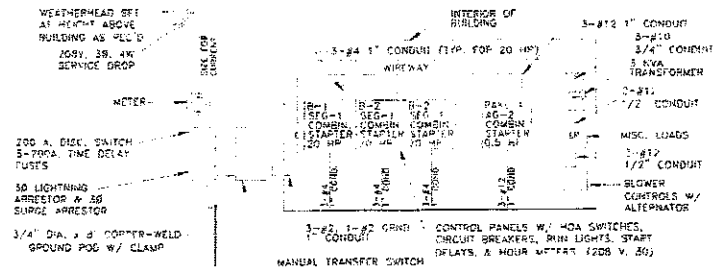
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS AND COORDINATE THE INSTALLATION OF THE ELECTRICAL AND TELEPHONE SERVICE TO SITE. COST OF ESTABLISHING SERVICE SHALL BE INCLUDED IN THE BID. THE TELEPHONE NUMBER SHALL BE PLACED INSIDE THE ALARM DIALER.

6. ALL CONTROL PANELS SHALL BE LABELED WITH PERMANENT, PLASTIC NAME PLATES.

7. ALL MOTORS SHALL BE PROVIDED WITH ADJUSTABLE TIME DELAYS AND PHASE MONITORS.

8. ALL WIRING, ELECTRICAL EQUIPMENT, CONTROLS, AND MOTORS SHALL BE PROTECTED FROM SURGES WITH EQUIPMENT DESIGNED FOR THIS APPLICATION.

9. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT THE CONTRACTOR SHALL PROVIDE AN INSTALLATION THAT IS COMPLETE AND FUNCTIONAL. ALL ITEMS NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, SHALL BE PROVIDED.



ELECTRICAL DISTRIBUTION
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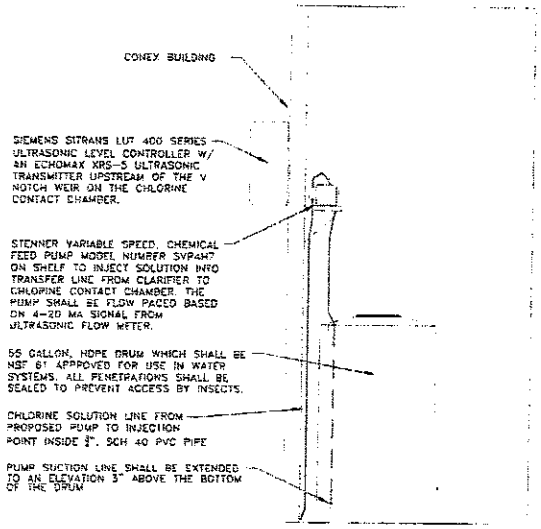

LIQUID CHEMICAL FEED
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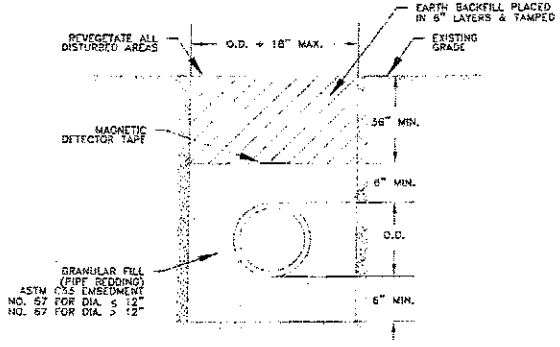

PIPE BEDDING
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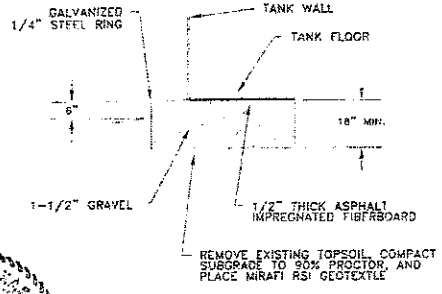

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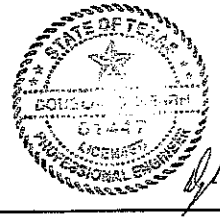

9/16/22

DESIGNED BY: DCH
DRAWN BY: ACL
CHECKED BY: DCH
SCALE: N/S
DATE: 9/2022

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

SHEET 8

Mail and More Etc
1400 Graham Dr Ste B
TOMBALL, TX 77375
281-351-1700

Shipment----------
FedEx Priority Overnight Envelope
Ship To:
APPLICATION REVIEW & PROCESSING MC-
TCEQ
12100 PARK THIRTY FIVE CIR
BUILDING F ROOM 2101
AUSTIN, TX 78753-1808
Package ID: 343946 42.23
Tracking #: 784875276778
Expected arrival: Wed 10/11 10:30 AM

SUBTOTAL	42.23
TAX	0.00
TOTAL	42.23
TEND Debit	42.23

Total shipments: 1
JEFF GOEBEL: GOEBEL ENVIRONMENTAL
10/10/2023
#299600 04:53 PM
Workstation: 47 - Auxiliary Workstation Left
CCTran# 0bcfe36c-0693-4892-ac76-2f1fa8dc736c

Signature_____

****
Thank you for shipping with us.
We greatly appreciate your business.
-Gloria
****

MMISSION ON ENVIRONMENTAL QUALITY

WASTEWATER PERMIT APPLICATION CHECKLIST

this checklist with the application.

mental, LLC

ems is included in your application.

N		Y	N
☐	Original USGS Map	☒	☐
☐	Affected Landowners Map	☒	☐
☐	Landowner Disk or Labels	☒	☐
☐	Buffer Zone Map	☒	☐
☐	Flow Diagram	☒	☐
☐	Site Drawing	☒	☐
☐	Original Photographs	☒	☐
☒	Design Calculations	☒	☐
☒	Solids Management Plan	☒	☐
☒	Water Balance	☐	☒
☒			
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☒			
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For TCEQ Use Only

Segment Number _____ County _____
Expiration Date _____ Region _____
Permit Number _____

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

APPLICATION FOR A DOMESTIC WASTEWATER PERMIT ADMINISTRATIVE REPORT 1.0

If you have questions about completing this form please contact the Applications Review and Processing Team at 512-239-4671.

Section 1. Application Fees (Instructions Page 29)

Indicate the amount submitted for the application fee (check only one).

Flow	New/Major Amendment	Renewal
<0.05 MGD	$350.00 ☐	$315.00 ☐
≥0.05 but <0.10 MGD	$550.00 ☐	$515.00 ☐
≥0.10 but <0.25 MGD	$850.00 ☐	$815.00 ☒
≥0.25 but <0.50 MGD	$1,250.00 ☐	$1,215.00 ☐
≥0.50 but <1.0 MGD	$1,650.00 ☐	$1,615.00 ☐
≥1.0 MGD	$2,050.00 ☐	$2,015.00 ☐

Minor Amendment (for any flow) $150.00 ☐

Payment Information:

Mailed — Check/Money Order Number: [redacted]

Check/Money Order Amount: [redacted]

Name Printed on Check: [redacted]

EPAY — Voucher Number: [redacted]

Copy of Payment Voucher enclosed? Yes ☒

Section 2. Type of Application (Instructions Page 29)

☐ New TPDES

☒ Major Amendment *with* Renewal

☐ Major Amendment *without* Renewal

☐ Renewal without changes

☐ New TLAP

☐ Minor Amendment *with* Renewal

☐ Minor Amendment *without* Renewal

☐ Minor Modification of permit

For amendments or modifications, describe the proposed changes: Need for additional flow

For existing permits:

Permit Number: WQ0014452001

EPA I.D. (TPDES only): TX0125776

Expiration Date: 7/12/23

Section 3. Facility Owner (Applicant) and Co-Applicant Information (Instructions Page 29)

A. The owner of the facility must apply for the permit.

What is the Legal Name of the entity (applicant) applying for this permit?

Undine Texas Environmental, LLC

(The legal name must be spelled exactly as filed with the Texas Secretary of State, County, or in the legal documents forming the entity.)

If the applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at http://www15.tceq.texas.gov/crpub/

CN: 604519330

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44.*

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Vance Tillman

Credential (P.E, P.G., Ph.D., etc.):

Title: CFO

B. Co-applicant information. Complete this section only if another person or entity is required to apply as a co-permittee.

What is the Legal Name of the co-applicant applying for this permit?

None

(The legal name must be spelled exactly as filed with the TX SOS, with the County, or in the legal documents forming the entity.)

If the co-applicant is currently a customer with the TCEQ, what is the Customer Number (CN)? You may search for your CN on the TCEQ website at: http://www15.tceq.texas.gov/crpub/

CN:

What is the name and title of the person signing the application? The person must be an executive official meeting signatory requirements in *30 TAC § 305.44.*

Prefix (Mr., Ms., Miss):

First and Last Name:

Credential (P.E, P.G., Ph.D., etc.):

Title:

Provide a brief description of the need for a co-permittee:

C. Core Data Form

Complete the Core Data Form for each customer and include as an attachment. If the customer type selected on the Core Data Form is **Individual**, complete **Attachment 1** of Administrative Report 1.0.

Attachment: A-1

Section 4. Application Contact Information (Instructions Page 30)

This is the person(s) TCEQ will contact if additional information is needed about this application. Provide a contact for administrative questions and technical questions.

A. Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: 3005 Fax No.:

E-mail Address: jgoebel@undinellc.com

Check one or both: ☒ Administrative Contact ☒ Technical Contact

B. Prefix (Mr., Ms., Miss):

First and Last Name:

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name:

Mailing Address:

City, State, Zip Code:

Phone No.: Ext.: Fax No.:

E-mail Address:

Check one or both: ☐ Administrative Contact ☐ Technical Contact

Section 5. Permit Contact Information (Instructions Page 30)

Provide two names of individuals that can be contacted throughout the permit term.

A. Prefix (Mr., Ms., Miss): Ms

First and Last Name: Carey Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: cthomas@undinellc.com

B. Prefix (Mr., Ms., Miss): Mr

First and Last Name: Andy Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Dr

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: athomas@undinellc.com

Section 6. Billing Information (Instructions Page 30)

The permittee is responsible for paying the annual fee. The annual fee will be assessed to permits ***in effect on September 1 of each year.*** The TCEQ will send a bill to the address provided in this section. The permittee is responsible for terminating the permit when it is no longer needed (using form TCEQ-20029).

Prefix (Mr., Ms., Miss): Ms

First and Last Name: Carey Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: cthomas@undinellc.com

Section 7. DMR/MER Contact Information (Instructions Page 31)

Provide the name and complete mailing address of the person delegated to receive and submit Discharge Monitoring Reports (EPA 3320-1) or maintain Monthly Effluent Reports.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Andy Thomas

Credential (P.E, P.G., Ph.D., etc.):

Title: Vice President

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: athomas@undinellc.com

DMR data is required to be submitted electronically. Create an account at: https://www.tceq.texas.gov/permitting/netdmr/netdmr.html.

Section 8. Public Notice Information (Instructions Page 31)

A. Individual Publishing the Notices

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-574-5953 Ext.: Fax No.:

E-mail Address: jgoebel@undinellc.com

B. Method for Receiving Notice of Receipt and Intent to Obtain a Water Quality Permit Package

Indicate by a check mark the preferred method for receiving the first notice and instructions:

☒ E-mail Address

☐ Fax

☐ Regular Mail

C. Contact person to be listed in the Notices

Prefix (Mr., Ms., Miss): Mr

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title:

Organization Name: Undine Texas Environmental, LLC

Phone No.: 713-574-5953 Ext.:

E-mail: jgoebel@undinellc.com

D. Public Viewing Information

If the facility or outfall is located in more than one county, a public viewing place for each county must be provided.

Public building name: **Sterling Municipal Library**

Location within the building:

Physical Address of Building: 1 Mary Elizabeth Wilbanks Ave

City: Baytown County: Chambers

Contact Name:

Phone No.: 281-427-7331 Ext.:

E. Bilingual Notice Requirements:

This information **is required** for **new, major amendment, and renewal applications.** It is not required for minor amendment or minor modification applications.

This section of the application is only used to determine if alternative language notices will be needed. Complete instructions on publishing the alternative language notices will be in your public notice package.

Please call the bilingual/ESL coordinator at the nearest elementary and middle schools and obtain the following information to determine whether an alternative language notices are required.

1. Is a bilingual education program required by the Texas Education Code at the elementary or middle school nearest to the facility or proposed facility?

   ☒ Yes ☐ No

   If **no**, publication of an alternative language notice is not required; **skip to** Section 9 below.

2. Are the students who attend either the elementary school or the middle school enrolled in a bilingual education program at that school?

   ☒ Yes ☐ No

3. Do the students at these schools attend a bilingual education program at another location?

   ☐ Yes ☒ No

4. Would the school be required to provide a bilingual education program but the school has waived out of this requirement under 19 TAC §89.1205(g)?

☐ Yes ☒ No

5. If the answer is yes to question 1, 2, 3, or 4, public notices in an alternative language are required. Which language is required by the bilingual program? Spanish

Section 9. Regulated Entity and Permitted Site Information (Instructions Page 33)

A. If the site is currently regulated by TCEQ, provide the Regulated Entity Number (RN) issued to this site. **RN1023422268**

Search the TCEQ's Central Registry at http://www15.tceq.texas.gov/crpub/ to determine if the site is currently regulated by TCEQ.

B. Name of project or site (the name known by the community where located):

Bayridge WWTP

C. Owner of treatment facility: Undine Texas Environmental, LLC

Ownership of Facility: ☐ Public ☒ Private ☐ Both ☐ Federal

D. Owner of land where treatment facility is or will be:

Prefix (Mr., Ms., Miss): Undine Texas Environmental, LLC``

First and Last Name:

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

E. Owner of effluent disposal site:

Prefix (Mr., Ms., Miss):

First and Last Name:

Mailing Address:

City, State, Zip Code:

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

F. Owner of sewage sludge disposal site (if authorization is requested for sludge disposal on property owned or controlled by the applicant):

Prefix (Mr., Ms., Miss):

First and Last Name:

Mailing Address:

City, State, Zip Code:

Phone No.: E-mail Address:

If the landowner is not the same person as the facility owner or co-applicant, attach a lease agreement or deed recorded easement. See instructions.

Attachment:

Section 10. TPDES Discharge Information (Instructions Page 34)

A. Is the wastewater treatment facility location in the existing permit accurate?

☒ Yes ☐ No

If **no, or a new permit application**, please give an accurate description:

B. Are the point(s) of discharge and the discharge route(s) in the existing permit correct?

☒ Yes ☐ No

If **no, or a new or amendment permit application**, provide an accurate description of the point of discharge and the discharge route to the nearest classified segment as defined in 30 TAC Chapter 307:

City nearest the outfall(s): Baytown

County in which the outfalls(s) is/are located: Chambers

Outfall Latitude: 29.65911111 Longitude: 94.89694444

C. Is or will the treated wastewater discharge to a city, county, or state highway right-of-way, or a flood control district drainage ditch?

☐ Yes ☒ No

If **yes,** indicate by a check mark if:

☐ Authorization granted ☐ Authorization pending

For **new and amendment** applications, provide copies of letters that show proof of contact and the approval letter upon receipt.

Attachment:

D. For all applications involving an average daily discharge of 5 MGD or more, provide the

names of all counties located within 100 statute miles downstream of the point(s) of discharge.

Under 5 MGD

Section 11. TLAP Disposal Information (Instructions Page 36)

A. For TLAPs, is the location of the effluent disposal site in the existing permit accurate?

☐ Yes ☒ No

If **no, or a new or amendment permit application**, provide an accurate description of the disposal site location:

Not a TLAP Application

B. City nearest the disposal site:

C. County in which the disposal site is located:

D. Disposal Site Latitude: Longitude:

E. For **TLAPs**, describe the routing of effluent from the treatment facility to the disposal site:

F. For **TLAPs**, please identify the nearest watercourse to the disposal site to which rainfall runoff might flow if not contained:

Section 12. Miscellaneous Information (Instructions Page 37)

A. Is the facility located on or does the treated effluent cross American Indian Land?

☐ Yes ☒ No

B. If the existing permit contains an onsite sludge disposal authorization, is the location of the sewage sludge disposal site in the existing permit accurate?

☐ Yes ☐ No ☒ Not Applicable

If No, or if a new onsite sludge disposal authorization is being requested in this permit application, provide an accurate location description of the sewage sludge disposal site.

Click here to enter text.

C. Did any person formerly employed by the TCEQ represent your company and get paid for service regarding this application?

☐ Yes ☒ No

If yes, list each person formerly employed by the TCEQ who represented your company and was paid for service regarding the application:

Click here to enter text.

D. Do you owe any fees to the TCEQ?

☐ Yes ☒ No

If **yes**, provide the following information:

Account number: Amount past due:

E. Do you owe any penalties to the TCEQ?

☐ Yes ☒ No

If **yes**, please provide the following information:

Enforcement order number: Amount past due:

Section 13. Attachments (Instructions Page 38)

Indicate which attachments are included with the Administrative Report. Check all that apply:

☒ Lease agreement or deed recorded easement, if the land where the treatment facility is located or the effluent disposal site are not owned by the applicant or co-applicant.

☒ Original full-size USGS Topographic Map with the following information:

- Applicant's property boundary
- Treatment facility boundary
- Labeled point of discharge for each discharge point (TPDES only)
- Highlighted discharge route for each discharge point (TPDES only)
- Onsite sewage sludge disposal site (if applicable)
- Effluent disposal site boundaries (TLAP only)
- New and future construction (if applicable)
- 1 mile radius information
- 3 miles downstream information (TPDES only)
- All ponds.

☐ Attachment 1 for Individuals as co-applicants

☒ Other Attachments. Please specify: A-2

Section 14. Signature Page (Instructions Page 39)

If co-applicants are necessary, each entity must submit an original, separate signature page.

Permit Number: WQ0013643001

Applicant: Undine Texas Environmental, LLC

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate 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 there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I further certify that I am authorized under 30 Texas Administrative Code § 305.44 to sign and submit this document, and can provide documentation in proof of such authorization upon request.

Signatory name (typed or printed): Carey Thomas

Signatory title: Vice President

Signature: Carey A. Thomas Date: 10.10.2023

(Use blue ink)

Subscribed and Sworn to before me by the said Carey A. Thomas

on this 10th day of October, 20 23.

My commission expires on the 28th day of January, 20 25.

Nicia Rotermund

Notary Public

[SEAL]

NICIA ROTERMUND
Notary Public, State of Texas
Comm. Expires 01-28-2025
Notary ID 129281276

Harris

County, Texas

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

SUPPLEMENTAL PERMIT INFORMATION FORM (SPIF)

FOR AGENCIES REVIEWING DOMESTIC TPDES WASTEWATER PERMIT APPLICATIONS

TCEQ USE ONLY:

Application type: ____Renewal ____Major Amendment ____Minor Amendment ____New

County: _____ Segment Number: _____

Admin Complete Date: _____

Agency Receiving SPIF:

_____ Texas Historical Commission _____ U.S. Fish and Wildlife

_____ Texas Parks and Wildlife Department _____ U.S. Army Corps of Engineers

This form applies to TPDES permit applications only. (Instructions, Page 53)

The SPIF must be completed as a separate document. The TCEQ will mail a copy of the SPIF to each agency as required by the TCEQ agreement with EPA. If any of the items are not completely addressed or further information is needed, you will be contacted to provide the information before the permit is issued. Each item must be completely addressed.

Do not refer to a response of any item in the permit application form. Each attachment must be provided with this form separately from the administrative report of the application. The application will not be declared administratively complete without this form being completed in its entirety including all attachments.

The following applies to all applications:

1. Permittee: Undine Texas Environmental, LLC

   Permit No. WQ00 13643001 EPA ID No. TX 0042081

   Address of the project (or a location description that includes street/highway, city/vicinity, and county):

   1.5 miles southeast of the intersection of FM 2354 and 1405

Provide the name, address, phone and fax number of an individual that can be contacted to answer specific questions about the property.

Prefix (Mr., Ms., Miss): Mr.

First and Last Name: Jeff Goebel

Credential (P.E, P.G., Ph.D., etc.):

Title: Business Development

Mailing Address: 17681 Telge Rd

City, State, Zip Code: Cypress Texas 77429

Phone No.: 713-724-9321 Ext.: Fax No.:

E-mail Address: jgoebel@undinellc.com

2. List the county in which the facility is located: Galveston
3. If the property is publicly owned and the owner is different than the permittee/applicant, please list the owner of the property.

Undine Texas Environmental, LLC

4. Provide a description of the effluent discharge route. The discharge route must follow the flow of effluent from the point of discharge to the nearest major watercourse (from the point of discharge to a classified segment as defined in 30 TAC Chapter 307). If known, please identify the classified segment number.

From the facility thence to Trinity Bay

5. Please provide a separate 7.5-minute USGS quadrangle map with the project boundaries plotted and a general location map showing the project area. Please highlight the discharge route from the point of discharge for a distance of one mile downstream. (This map is required in addition to the map in the administrative report).

Provide original photographs of any structures 50 years or older on the property.

Does your project involve any of the following? Check all that apply.

- ☒ Proposed access roads, utility lines, construction easements
- ☐ Visual effects that could damage or detract from a historic property's integrity
- ☐ Vibration effects during construction or as a result of project design
- ☒ Additional phases of development that are planned for the future
- ☐ Sealing caves, fractures, sinkholes, other karst features

☐ Disturbance of vegetation or wetlands

6. List proposed construction impact (surface acres to be impacted, depth of excavation, sealing of caves, or other karst features):

None

7. Describe existing disturbances, vegetation, and land use:

WWTP Site

THE FOLLOWING ITEMS APPLY ONLY TO APPLICATIONS FOR NEW TPDES PERMITS AND MAJOR AMENDMENTS TO TPDES PERMITS

8. List construction dates of all buildings and structures on the property:

Not Known

9. Provide a brief history of the property, and name of the architect/builder, if known.

WWTP Site

WATER QUALITY PERMIT

PAYMENT SUBMITTAL FORM

Use this form to submit the Application Fee, if the mailing the payment.

- Complete items 1 through 5 below.
- Staple the check or money order in the space provided at the bottom of this document.
- **Do not mail this form with the application form.**
- Do not mail this form to the same address as the application.
- Do not submit a copy of the application with this form as it could cause duplicate permit entries.

Mail this form and the check or money order to:

BY REGULAR U.S. MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
P.O. Box 13088
Austin, Texas 78711-3088

BY OVERNIGHT/EXPRESS MAIL

Texas Commission on Environmental Quality
Financial Administration Division
Cashier's Office, MC-214
12100 Park 35 Circle
Austin, Texas 78753

Fee Code: WQP **Waste Permit No:** WQ0013643001

1. Check or Money Order Number:
2. Check or Money Order Amount:
3. Date of Check or Money Order:
4. Name on Check or Money Order:
5. APPLICATION INFORMATION

   Name of Project or Site: Bay Ridge

   Physical Address of Project or Site: 1.5 miles southeast of the intersection of FM 2354 and 1405

   If the check is for more than one application, attach a list which includes the name of each Project or Site (RE) and Physical Address, exactly as provided on the application.

Staple Check or Money Order in This Space

THIS PAGE INTENTIONALLY LEFT BLANK

Section 1. Individual Information (Instructions Page 50)

Complete this attachment if the facility applicant or co-applicant is an individual. Make additional copies of this attachment if both are individuals.

Prefix (Mr., Ms., Miss):

Full legal name (first, middle, last):

Driver's License or State Identification Number:

Date of Birth:

Mailing Address:

City, State, and Zip Code:

Phone Number: Fax Number:

E-mail Address:

CN:

For Commission Use Only:
Customer Number:
Regulated Entity Number:
Permit Number:

CHECKLIST OF COMMON DEFICIENCIES

Below is a list of common deficiencies found during the administrative review of domestic wastewater permit applications. To ensure the timely processing of this application, please review the items below and indicate by checking Yes that each item is complete and in accordance applicable rules at 30 TAC Chapters 21, 281, and 305. If an item is not required this application, indicate by checking N/A where appropriate. Please do not submit the application until the items below have been addressed.

Core Data Form (TCEQ Form No. 10400) ☐ Yes
(Required for all applications types. Must be completed in its entirety and signed. Note: Form may be signed by applicant representative.)

Correct and Current Industrial Wastewater Permit Application Forms ☐ Yes
(TCEQ Form Nos. 10053 and 10054. Version dated 6/25/2018 or later.)

Water Quality Permit Payment Submittal Form (Page 19) ☐ Yes
(Original payment sent to TCEQ Revenue Section. See instructions for mailing address.)

7.5 Minute USGS Quadrangle Topographic Map Attached ☐ Yes
(Full-size map if seeking "New" permit. 8 ½ x 11 acceptable for Renewals and Amendments)

Current/Non-Expired, Executed Lease Agreement or Easement Attached ☐ N/A ☐ Yes

Landowners Map ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Things to Know:

- All the items shown on the map must be labeled.
- The applicant's complete property boundaries must be delineated which includes boundaries of contiguous property owned by the applicant.
- The applicant cannot be its own adjacent landowner. You must identify the landowners immediately adjacent to their property, regardless of how far they are from the actual facility.
- If the applicant's property is adjacent to a road, creek, or stream, the landowners on the opposite side must be identified. Although the properties are not adjacent to applicant's property boundary, they are considered potentially affected landowners. If the adjacent road is a divided highway as identified on the USGS topographic map, the applicant does not have to identify the landowners on the opposite side of the highway.

Landowners Cross Reference List ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Landowners Labels or USB Drive attached ☐ N/A ☐ Yes
(See instructions for landowner requirements)

Original signature per 30 TAC § 305.44 – Blue Ink Preferred ☐ Yes
(If signature page is not signed by an elected official or principle executive officer, a copy of signature authority/delegation letter must be attached)

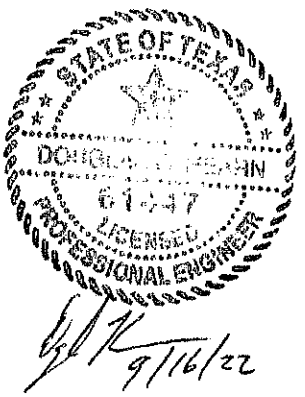
UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
CHAMBERS COUNTY, TEXAS
TPDES NO. WQ0013643001

SEPTEMBER, 2022

PREPARED BY:

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PHONE 512-310-0176
FIRM # F-1234



BAYRIDGE WWTP DESIGN REPORT
CHAMBERS COUNTY, TEXAS
UNDINE

ENGINEER: Douglas Hearn, P.E., R.P.L.S.
Hearn Engineering, Inc.
P.O. Box 1104
Cameron, Texas 76520

DATE: 09/16/22

DESIGN PARAMETERS:

Permitted Flows:

Average Daily Flow =	0.100 mgd =	69	gpm (Qavg)
2-hour Peak Flow =	0.30 mgd =	208	gpm (Qpk)
Peak Factor =	3.0		

Influent Strength:

CBOD5 =	250 mg/l =	209	ppd
TSS =	250 mg/l =	209	ppd
NH3-N =	40 mg/l =	33	ppd

Effluent Limits:

$CBOD_5$ =	10 mg/l
TSS =	15 mg/l
NH_3-N =	3 mg/l
D.O. =	4 mg/l

Process Design: The existing treatment plant utilizes the extended aeration process. The proposed modifications are intended to replace the existing plant with similar process which will produce effluent that will meet the permit requirements of BOD5 = 10 mg/l, TSS = 15 mg/l, D.O. - 4 mg/l, pH between 6.0 and 9.0 standard units, and Chlorine Residual = 1 mg/l after 20 minute detention time at an average daily flow of 100,000 gpd. The anticipated operating range for MLSS is 3,000 mg/l.

Design Features: The two existing gravity collection systems flow to the lift stations which pump to the plant. Flows into the plant will enter thru a bar screen. After passing thru the aeration basin, flows automatically transfer aerated sludge into the clarifier. Clear water will overflow the perimeter weirs and travel to a new chlorine contact chamber where it is dosed with liquid chlorine by a chemical feed pump. The chamber is sized to allow 20 minute detention time prior to beind discharged into the pipe to the bay. Settled sludge from the clarifiers will either be returned to the aeration basin where it will be mixed with the influent (RAS) or wasted to the sludge holding basin (WAS) where it can be thickened before being liquid hauled to a TCEQ approved facility by a TCEQ licensed hauler. Three regenerative blowers will provide air for the aeration basin, sludge holding, chlorine contact, and the air lift pumps while reducing noise. The plant design includes a manual transfer switch for a generator. An alarm dialer has been installed on the plant to alert personnel in the event of power outages and high levels.

BAYRIDGE WWTP DESIGN REPORT

AERATION BASIN:

Criteria:

Organic Loading =	30	lbs BOD_5/1,000 cf
Oxygen Requirement =	2.2	lbs/lb BOD_5
	4.6	lbs/lb NH_3 - N

Volume Required:

Influent BOD_5 =	209	ppd
Minimum Volume =	6,950	cf

Basin Dimensions:

Number of Basins =	1.00		
Sidewater Depth =	10.0	ft	
Basin Dimensions =	12.0	ft Wide x	58.0 ft Long
Actual Basin Area =	696	sf	
Actual Basin Volume =	6,960	cf	

Actual Loading:

Organic Loading =	30.0	lbs BOD_5/1,000 cf

Oxygen Requirement:

$$O_2R = (1.2(BOD_5)+4.3(NH_3\text{-}N))/BOD_5)$$

O_2R = 1.89 lbs O_2 / lbs BOD_5

Airflow Requirement:

$$RAF = \frac{(PPD\ BOD_5 * O_2R)}{(WOTE*0.23*0.075*1440)}$$

Diffuser Eff. =	4%	
RAF =	396	scfm
TCEQ Minumum Air Requirement =	3,200	* lbs BOD_5/1440
=	463	cfm

Aeration System:

Number of Diffusers =	19	
Airflow per Diffuser =	25	scfm/diffuser
Diffuser Submergence =	8.00	ft

BAYRIDGE WWTP DESIGN REPORT

CLARIFIER:

Criteria:

Surface Loading =	600	gpd/sf @ average flow
	1,200	gpd/sf @ peak flow
Detention Time =	3.0	hrs @ average flow
	1.8	hrs @ peak flow
R.A.S. Rate =	150%	

Basin Requirements:

@ Average Flow =	167	sf
	1,671	cf
@ Peak Flow =	250	sf
	3,008	cf
Number of Basins =	1	
Minimum Diameter =	17.8	ft

Basin Dimensions:

Number of Basins =	1	
Basin Diameter =	18.0	ft
Sidewater Depth =	10.0	ft
Actual Surface Area =	254	sf
Actual Volume =	2,545	cf

Actual Surface Loading:

@ Average Flow =	393	gpd/sf
@ Peak Flow =	1,179	gpd/sf

Actual Detention Time:

@ Average Flow =	4.6	hrs
@ Peak Flow =	1.5	hrs

Weir Loading Rate =	20,000	gpd/lf @ peak flow
Min. Required Weir Length =	15.0	lf

CHLORINE CONTACT CHAMBER:

Criteria:

Detention Time =	20	min @ peak flow
Airflow =	20	scfm/1,000 cf

Volume Required:

Peak Flow =	208	gpm
Minimum Volume =	557	cf

Basin Dimensions:

Number of Basins =	1		
Sidewater Depth =	7.0	ft @ peak flow	
Basin O.D. =	12.0	ft x	8.0 ft
Actual Basin Area =	96.0	sf	
Actual Basin Volume =	672	cf	

Aeration System:

Airflow =	13	scfm
Number of Diffusers =	1	
Airflow per Diffuser =	20	scfm/diffuser
Diffuser Submergence =	6.0	ft

BAYRIDGE WWTP DESIGN REPORT

SOLIDS HANDLING:

Criteria:

TCEQ Basin Design Volume =	10	cf/lb BOD_5/day		
TCEQ Min. Required Airflow =	30	scfm/1000 cf		
Min. Sludge Retention =	15	days		
Influent BOD_5 =	250	mg/l =	209	ppd
Effluent BOD_5 =	10	mg/l =	8	ppd
Removed BOD_5 =	240	mg/l =	200	ppd
Required Volume =	2,002	cf		

Basin Dimensions:

Number of Basins =	1			
Sidewater Depth =	10.5	ft		
Basin Dim. =	12.0	ft x	16.0	ft
Actual Basin Area =	192	sf		
Actual Basin Volume =	2,016	cf		

Aeration System:

Required Airflow =	60	scfm
Number of Diffusers =	3	
Airflow per Diffuser =	20	
Diffuser Submergence =	8.5	ft

BLOWERS REQUIRED:

Aeration Basin		463 scfm
Chlorine Contact Basin		13 scfm
Digester		60 scfm
Air Lift @ 10 scfm/ea	4	40 scfm
Total Aeration Required		577 scfm

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
CHAMBERS CO., TEXAS
TECHNICAL SPECIFICATIONS
INDEX

ITEM NO. 1

GENERAL

1.01 Scope of Work: The work covered by these Specifications consists of furnishing all labor, equipment, machinery and materials and performing all operations in connection with the construction of wastewater system improvements for Undine, L.L.C.. Wherever the term "Engineer" is used in the Specifications, it shall be construed to mean "Hearn Engineering, Inc.", or its designated representatives.

1.02 Construction Site: During construction the Contractor shall keep the site free and clear of all rubbish and debris and shall clean-up the site promptly when notified to do so by the Owner's representative. The Contractor shall, at his own expense, maintain streets free from dust, mud, excess earth or debris which constitutes a nuisance or danger to the public using the thoroughfare or the occupants of adjacent properties. Care shall be taken to prevent spillage on streets over which hauling is done, and any such spillage or debris due to construction operations shall be immediately removed.

1.03 Backwork: The Contractor shall coordinate his operations in such a manner as to prevent the amount of clean-up and completion of backwork from becoming excessive. Should such a condition exist, the Owner's representative may order all or portions of the work to cease and refuse to allow any work to commence until the backwork is done to his satisfaction.

1.04 Grading: The Contractor shall do such grading in the area adjacent to backfilled trenches and structures as may be necessary to leave the area in a neat and satisfactory condition, approved by the Owner's representative.

1.05 Inspection of Work: The principal inspection for the work covered under this Contract shall be by the Owner and his designated representatives. The quality of material and the quality of installation of pipe and related equipment shall be to the satisfaction of the Inspector. It shall be the Contractor's responsibility for the construction methods and safety precautions in the undertaking of this Contract.

1.06 Notification: The Owner must be notified a minimum of 24-hours in advance of beginning construction.

1.07 Testing And Acceptance of Improvements: The Owner's representative will be present at the testing and balancing of electrical systems, mechanical systems, and linework. The Contractor will test all lines and be confident that the lines will be able to pass the test prior to calling the Owner's representative to observe the tests. No lines will be accepted by the Owner without the Owner's representative observing the tests and certifying to the lines passing the pressure tests as specified herein.

In addition, all water-containing vessels (i.e., ground tank, pressure tank, etc.) shall be tested for leakage prior to being placed in service. The maximum allowable leakage for the 24-hour testing period shall be 1/4-inch plus the daily evaporation rate as established by the NWS.

1.08 Work in Freezing Weather: Portions of the work may continue as directed by the Owner's representative.

1.09 Property Lines and Monuments: The Contractor shall be responsible for the protection, reference and resetting of property corner monuments if disturbed.

1.10 Contractor's Use of Premises: The Contractor shall, at his own expense, provide additional space as necessary for his operations and storage of materials. The Contractor shall be responsible for providing and maintaining all needed construction related facilities as part of the contract including, but not limited to telephone, fax services, job office, electricity, potable water, sanitary facilities, security, and waste disposal. The Contractor shall not use the facilities of the Owner without permission. The site shall be kept free of debris at all times.

1.11 Trade Names: Except as specified otherwise, wherever in the Specifications an article or class of material is designated by a trade name or by the name or catalog number of any maker, patentee, manufacturer, or dealer, such designations shall be taken as intending to mean and specify the articles described or another equal thereto in quality, finish, and serviceability for the purpose intended, as may be determined and judged by the Engineer in his sole discretion.

1.12 Materials And Workmanship: No material which has been used by the Contractor for any temporary purpose whatever is to be incorporated in the permanent structure without written consent of the Engineer. Where materials or equipment are specified by a trade or brand name, it is not the intention of the Owner to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality for 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 item, in the opinion or judgment of the Engineer. Unless otherwise specified, all materials shall be the best of their respective kinds and shall be in all cases fully equal to approved samples. Notwithstanding that the words "or 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 shall be approved in writing by the Engineer and the Engineer shall have the right to require the use of such specifically designated material, article or process.

1.13 Operation and Maintenance Manuals: Six (6) sets of complete Operation and Maintenance (O&M) Manuals shall be supplied by the equipment manufacturer at the time of shipment. Manuals shall be submitted for approval by the Engineer.

1.14 Service: The equipment manufacturers shall provide the services of a technical service representative to inspect and adjust the completed installation and to instruct the Owner's personnel in the care and operation of the equipment specified herein. The manufacturers shall maintain a service organization available on call with spare parts from local stock. All equipment provided on this project shall be guaranteed against defects of material and workmanship for a period of one (1) year from date of acceptance of the project by the Owner.

Field service shall be included in each equipment manufacturer's bid to check out the installed equipment, place it in operating service and provide start-up and maintenance instruction service to the plant operating personnel. Field service time is not intended to include any time in the field required to correct fabrication or installation errors, and any charges resulting from time required for this must be resolved between the manufacturer and/or equipment supplier and the General Contractor. The equipment manufacturer shall coordinate all field service trips with the General Contractor and the Owner's representative.

1.15 "AS-BUILT DRAWINGS": The Contractor shall furnish to the Engineer one (1) set of marked-up Plans, showing all the changes and deviations made to the original Plans during the construction of this Project. Dimensions shall be provided where necessary to properly locate all structures,

pipelines and appurtenances. Three (3) sets of electrical "as-built" wiring diagrams shall also be furnished to the Engineer for all equipment and controls by the Electrical Subcontractor through the General Contractor. The Engineer will record the changes, include the electrical diagrams on the original Plans and provide the required sets of "as-built" Plans to the Owner.

1.16 Safety: All work shall comply with the rules set out by the Occupational Safety and Health Act. A minimum of one competent person, that is not working in the excavation, shall monitor excavations exceeding four feet in depth. The person shall be trained to recognize dangerous conditions, proper use of trench protection, CPR, and First Aid in accordance with 29 CFR 1926, Subpart P. All excavations over five feet deep shall be shored, shielded, or sloped in accordance with 29 CFR, Subpart P.

1.17 Measurement And Payment: No separate payment for work performed under this item. Include cost of same in contract price bid for all items of which this work is a component.

ITEM NO. 2

SITE PREPARATION

1.01. Scope: This section of the specifications describes materials and equipment to be utilized and requirements for their use in preparing the work site for construction and performing all earthwork. Site clearing and grubbing within the construction area will be performed by the Contractor. The Contractor shall furnish all materials, equipment and labor necessary to complete the work.

1.02. Underground Soil Data: No soil borings have been taken on this project.

1.03. Existing Underground Utilities and Obstructions: The Drawings indicate underground utilities or obstructions that are known to exist according to the best information available to the Owner. The site shall be carefully scrutinized for evidence of utilities. Prior to any ground disturbance, the contractor shall call the Texas One Call system at 811for utility locates. Calling the number will only confirm the existence of underground utilities owned by companies that subscribe to the service. There may be other utilities in the area and the Contractor will be responsible for insuring that no damage is done to any utilities whether shown or not shown.

A. Electronic Pipe and Cable Finder: Furnish and have available at all times an electronic pipe detector, in good working order, to locate existing pipe lines or other obstructions.

B. Relocation of Services: Locate all utilities services to avoid interference with such services and determine whether these services should be relocated. Repair any damage done to utilities services or pipe line resulting from efforts to locate services or resulting from the construction operation.

NOTE: Any delay or extra cost due to encountering underground utilities or obstructions not shown on the Drawings or found in locations different from those shown on the Drawings shall not constitute a claim for additional payments.

1.04 Surface Drainage: The contractor shall prevent surface water and ground water from flowing into excavations and from flooding project site and surrounding areas. De-water excavated areas as required to remove any water.

2.00 Clearing: The Contractor shall clear from areas indicated on the plans all natural and artificial obstructions, including, but not limited to trees, stumps, brush, shrubs, rubbish, existing storm sewers, abandoned utility lines and debris with the exception of trees designated to be left in place. The natural ground surface shall be cleared of all vegetable growth, such as trees, logs, stumps, roots of downed trees, brush, grass, weeds. Contractor shall haul all trash, rubbish and debris from site prior to starting excavation or grading. Unless otherwise authorized, the area to be cleared and grubbed shall include the work area plus three feet outside the work area.

A. Removal Procedures:

1. Stumps: Remove to a depth at least 3 feet below finished subgrade and backfill with suitable material to a density not less than that of adjacent soil.

2. Abandoned Obstructions: Remove or break down masonry and asphalt structures to a depth of at least 1 foot below finished grade. Thoroughly crack or otherwise

break abandoned structures remaining in place which may impound water where they exist within 10 feet of finished grade backfill with suitable material to a density not less than that of adjacent soil.

3. Tap roots and other significant objectionable matter: Remove to a depth of at least 1 foot below subgrade.

4. Protect from damage those trees and bushes not designated on the Drawings to be removed.

5. Accomplish clearing and grubbing well in advance of earth work to allow sufficient time for inspection and staking.

3.00 Excavation: The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions and levels shown on the Drawings and/or specified. Excavation may be accomplished by any customary method.

A. Unsuitable Subgrade Material: Any material in the opinion of the Engineer which is unsuitable for subgrade shall be removed and replaced with compacted earth material as directed by the Engineer.

B. Topsoil: Topsoil shall be stripped from the construction areas. Material determined suitable by the Engineer shall be stockpiled on site at a location designated by the Engineer. Unsuitable material shall be removed from the site. Replacing topsoil after final grading operation is included in this work. Stockpiled topsoil shall be spread evenly over designated areas at the end of grading operations. Rough grade elevations extending 30' outside the building perimeter shall be 6" lower than the finish grades shown on the plans.

C. Disposal of Material: Unless otherwise specifically authorized, all objectionable material is the Contractor's property and must be removed from the project area.

4.00 Proof-rolling: Proof-rolling shall consist of the moving an 18 ton tandem dump, or equal, to cover base thoroughly by lapping the tires one width each pass to assure a minimum tolerance of a 1/2" settling and no cracking or pumping, prior to any paving. This is to be witnessed by the engineer.

Subgrade shall be proof-rolled with six passes of the roller. Depressions that develop during the proof-rolling operation shall be filled with suitable material and those filled areas shall be proof-rolled with six passes of the roller. If, after having been filled and proof-rolled, the subgrade still contains depressions, the area shall be undercut to the full depth of the soft material or 5 feet whichever is less, backfilled, and rolled to achieve a subgrade acceptable to the Engineer.

After the proof-rolled subgrade has been accepted by the Engineer, the surface of the subgrade shall be finished rolled with a smooth steel wheel roller weighing not less than 10 tons.

Conduits, pipes, culverts, and underdrains shall be neither disturbed nor damaged by proof-rolling operations. Rollers shall neither pass over, nor approach closer than five feet to, conduits, pipes, culverts, and underdrains unless the tops of those products are deeper than three feet. Areas not rolled due to the proximity to conduits, pipes, culverts and underdrains shall be hand tamped.

5.00. Compaction: Scarified soil and fill material shall be compacted to dry densities as determined by

the Standard Proctor Compaction Test performed in accordance with ASTM D 698. The fill material shall be spread in loose lifts of not more than eight inches and shall be compacted with a vibratory or sheepsfoot roller. Each lift shall be compacted to a minimum density of 95% of the maximum dry density as determined in accordance with ASTM D 698, current edition. The fill soil moisture content shall be maintained within 3% of the optimum moisture content as determined in accordance with ASTM D 698, current edition.

5.01 Compaction of fill shall be by sheepsfoot rollers with staggered uniformly spaced knobs and suitable cleaning devices. The projected area of each knob and the number and spacing of the knobs shall be such that the total weight of the roller and ballast when distributed over the area of one row of knobs shall be 250 psi. Placement and compaction of materials shall extend beyond the final contours sufficiently to insure compaction of the material at the resulting final surface. Final contours shall then be achieved by a tracked bulldozer shaping the face of the embankment.

Compaction of backfill around structures shall be accomplished by heavy power tamping equipment.

If tests indicate that density of fill is less than that specified, the area shall be either re-compacted or undercut, filled, and compacted until specified density is achieved at no cost to the Owner.

6.00 Construction Along Highways, Streets, and Roadways: Conduct all construction related activities along highways, streets and roadways in accordance with the applicable regulations of the City, County, and State with reference to construction operations, safety, traffic control, road maintenance and repair.

A. Protection of Traffic: Provide and maintain suitable signs, barricades and lights, as required by the County, for protection of traffic. Replace all highway signs removed for construction as soon as possible. Do not close or block any highway, street, or roadway without first obtaining permission from the proper authorities. Flagmen shall be provided to direct and expedite the flow of traffic.

B. Construction Operations: Perform all work along highways, streets and roadways to least interfere with traffic.

1. Shaping: Reshape damaged slopes, side ditches, and ditch lines immediately after completing backfilling operations. Replace topsoil, sod and any other materials removed from shoulders.

C. Excavated Materials: Do not place excavated material along highways, streets and roadways in a manner which obstructs traffic. Sweep all scattered excavated material off of the pavement.

D. Drainage Structures: Keep all side ditches, culverts, cross drains, and other drainage structures clear of excavated material and free to drain at all times.

E. Maintaining Highways, Streets, Roadways and Driveways: Maintain streets, highways, and roadways in suitable condition for movement of traffic until completion and final acceptance of the work. Use steel running plate to maintain traffic until pavement replacement is completed.

5.00 Building Site Preparation: The Contractor shall grade the site to conform with the subgrade elevations for the building and paving areas and shall grade all other areas to the finish contour elevations shown on the plans. All grading and excavation shall be in accordance with the following requirements:

A. Extent of Work: The building pad area shall be extended 5' beyond the exterior walls of the building to allow for foundation construction.

B. Proof-rolling: The building pad area and all areas to receive fill shall be proof-rolled as described above. Any yielding, pumping or soft areas shall be cut-out and replaced with fill compacted as specified herein.

C. Fill Material: The fill soil used to bring the site to grade shall be limited to soils classified in accordance with ASTM D 2487 as GM, GC, SW, SP, SM, SC, ML and CL. The on-site soils in the cut section are generally of a satisfactory classification. The classification of the soil material used for the building pad areas shall be verified by an approved soils testing laboratory during construction.

D. Compaction: See above.

E. Backfill: Backfilling of walls, structures and trenches shall be compacted in six inch loose lifts. Each lift shall be compacted using a mechanical tamp such as a vibratory or impact type compactor. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface or subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing or harrowing until moisture content is reduced to a satisfactory value.

F. Slopes: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Shore and brace as necessary.

1.07 Backfilling and Embankment: Fill materials shall be placed as required to provide compacted backfill for pavements.

A. Materials: Fill materials shall be free of organic or other perishable material and shall not contain stones or rubble. No material shall be placed when frozen.

B. Soil Sterilization: Soil shall be sterilized and void of live vegetation in an area contained within limits one foot outside the proposed edge of pavement. Herbicide shall be HYBAR XL by Dupont applied at a rate of 10 gallons per acre (follow dilution instructions on label) or PRIMATOL by Ciba Geigy applied at a rate of 20 gallons per acre (follow dilution instruction on label).

C. Proof-rolling: All areas beneath new roadway pavement shall be proof-rolled to detect soft spots after scarification and compaction but before placement of primer and pavement. Contractor may at his option proof-roll areas prior to scarification.

D. Scarification: Following proofrolling, the construction area shall be stripped of topsoil and all unsuitable materials removed as described under Excavation. The area shall then be scarified to a depth of at least eight inches with a disc harrow. Soil shall be well pulverized and mixed (sand-clay) to a depth of eight inches.

E. Compaction: See above.

1.08 Final Grading: Graded areas shall be made to blend into conformation with remaining ground surfaces. All surfaces shall be left smooth and free to drain.

1.09 Payment: Payment for all equipment, labor and materials required to clear; grub; remove; pipe; sterilize soil; scarify, grade and roll road beds, building pads, embankments, and fill for site; in this section of the Specifications shall be included in the unit price bid in the Proposal for the grading and for clearing as it pertains.

ITEM NO. 3

CAST-IN-PLACE CONCRETE

1.00 GENERAL

1.01 General: The General Conditions and Special Conditions of the Specification are incorporated herein. Also incorporated herein is ACI Standard 301, "Specifications for Structural Concrete for Buildings," and ACI Standard 318, "Building Code Requirements for Reinforced Concrete." ACI Standard 301 mentioned above is incorporated in its entirety with modifications, exclusions, expansions, noted hereinafter. Items noted thus (*_____) refer to the indicated section of ACI Standard 301. Copies of ACI Standard 301 are obtainable at a nominal cost from the American Concrete Institute, P.O. Box 4754, Redford Station, Detroit, Michigan 38219. A copy of this standard will be maintained in the Contractor's job site office at all times. All Standards cited in this specification shall be current edition.

1.02 Shop Drawings: Submit in accordance with General Conditions; obtain final corrections and review prior to fabrication.

A. Reinforcing Steel: Show dimensions, schedule, bending details, bar lists, and placing plans. Shop drawings showing all dimensions necessary for fabrication and placing of the reinforcing steel and accessories, with out reference to the project drawings, shall be submitted for approval. Approval shall be obtained before fabrication.

B. Checking: The Contractor shall require that the material supplier submit a signed written statement, in conjunction with the shop drawing submittal, that the drawings have been checked for compliance with the contract requirements. Such checking shall include but not be limited to size, shape, length, quantity, and location. The checking shall have been performed by a person or persons regularly engaged in drawing checking, and shall not be the person or persons who prepare the drawings.

2.00 CONCRETE

2.01 Admixtures: Air-entraining admixtures (ASTM C260) are not required in all concrete unless noted. Calcium chloride admixture (ASTM D98) will not be permitted. Use of "Pozzolith" water-reducing admixture (manufactured by the Master Builders Company) will be required in all concrete used in the base slabs, interior division walls, and perimeter walls. (*2.2)

2.02 Concrete: Concrete shall be ultimate stress type which shall develop 3000 psi compressive strength at 28 days. All concrete shall be of normal weight. (*3.2). All concrete exposed to the weather shall contain an air-entraining agent for protection against potentially destructive exposure. (*3.4). Concrete shall be vibrated and slump shall be in accord with Table 305(a) of ACI 301-66.

2.03 Proportioning of Ingredients: Mix designs shall be established by Method 2 or Alternate Procedure (d), but all 3000 psi concrete shall contain not less than 4 bags of cement per cubic yard of concrete except that the 3000 psi 6" slump concrete shall contain not less than 4-3/4 nor more than 5-1/4 bags of cement per cubic yard of concrete, and not more than 7.5 gallons of water per bag of cement. (*3.8).

2.04 Curing: Use of compounds as noted in (b) (5) is prohibited for curing. All curing shall be damp curing. Where floors are scheduled for cement finish, floors shall be treated, after final curing, with 3 full, even coats of Sonneborn Building Products, Inc.'s Lapidolith Liquid Floor Hardener, Euclid Chemical Company's Euco Liquid Floor Hardener, or A.C. Horn Products' Hornolith. (*Chapter 12).

3.00 FORMWORK

3.01 General: Assume all responsibility for the design and engineering of the formwork as well as its construction and removal. Design formwork for the loads, lateral pressure, and allowable stresses outlined in "Recommended Practice for Concrete Form work", ACI 347.

3.02 Materials: Facing materials shall be such as to provide the specified surface finish. Form coating shall be a field applied chemical concrete release agent capable of preventing bond between poured concrete and the form and shall contain no oil; or shall be factory applied non-absorptive liner. Coat forms before reinforcement is placed.

3.03 Tolerances: Formwork shall be constructed so that concrete surfaces will conform to the tolerance limits specified in Table 4.3.1 "Tolerances for Formed Surfaces," ACI 301. Provide positive means of adjustment (wedges or jacks) of shores and struts to compensate for anticipated deflections and settlement in the formwork during concrete placing operations.

3.04 Form Construction: Contractor shall build forms tight to prevent loss of mortar from the concrete. Provide clean-out openings at base of column, pier, and wall forms to facilitate cleaning and observation immediately before concrete is placed. Unless shown otherwise on drawings, corners of concrete members exposed to view after all other finish materials are in place shall be beveled by the use of chamfer strips, measuring 1/2" across the beveled face, placed in the forms. Submit sample for approval before proceeding. Overlap and hold forms against hardened concrete of a previous placement to prevent offsets or loss of mortar at the construction joint and to maintain a true surface.

3.05 Removal of Forms: Shoring and forming may be removed from formed members when concrete attains 75% of the 28-day design strength, but not earlier than 7 days after placing. Testing of field cured cylinders is required to established strength for form removal. Cylinders shall be molded and tested as specified ASTM C31, ACI 301. Testing to determine field strength shall be made at no extra cost to the Owner.

3.06 Reshoring: Members to receive construction loads shall be reshored so as to distribute construction loads safely to the ground or to members capable of supporting the construction loads without exceeding their design live load. Members supporting construction loads shall have gained the full specified 28-day concrete strength prior to loading.

3.07 Camber:

A. Cantilever Slabs: Camber at end of cantilever in increments of 1/8-inch per 5-foot of length.

B. One-way Slabs: Camber at midspan in increments of 1/8-inch per 10-foot of span.

C. Two-Way Slabs: Camber at center of bay in increments of 1/8-inch per 10-foot of diagonal distance between supports.

D. Camber all slabs except cantilever slabs less than 5-foot length and one-way slabs less than 10-foot span or as indicated on PLANS.

E. Do not camber beams unless indicated on PLANS.

4.00 REINFORCING STEEL

4.01 Material

A. Reinforcement shall be fabricated from ASTM A615 and Supplement S1 Deformed Billet Steel Bars for Concrete Reinforcement 60,000 psi yield point strength.

B. Welded smooth wire fabric (W) shall conform to "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" ASTM 185 and shall be fabricated from plain wire conforming to "Specifications for Cold-Drawn Steel Wire for Concrete Reinforcement" ASTM A82-76.

C. Welded deformed wire fabric (D) shall conform to "Specifications for Welded Deformed Steel Wire Fabric for Concrete Reinforcement" ASTM A497 and shall be fabricated from deformed wire conforming to "Specifications for Deformed Steel Wire for Concrete Reinforcement" ASTM A496.

D. Wire bar supports shall conform to the National Bureau of Standards PS7, "Wire Bar Supports for Reinforced Concrete Construction."

E. Precast concrete block bar supports shall be Precast Concrete Doweled Blocks or Precast Concrete Blocks with wires as indicated in the Manual of Standard Practice CRSI Current Edition.

F. Bar supports shall be as follows:

1. On Ground: Precast Concrete Block Supports or Class "A" Bright Basic Bar Supports with earth-bearing bases (sand plates) of 20 gauge metal;

2. Interior: Class "B" Pre-galvanized Bar Supports or Class "E" Special Stainless Supports;

3. Exterior: Class "D" Hot Dipped Galvanized Bar Supports conforming to Table I, ASTM A153 or Class "E" Special Stainless Bar Supports; and,

4. Tie wire shall not be less than 16 gauge black annealed wire.

1.03 Fabrication

A. All hooks shall be bent using the pin diameters and dimensions as defined as "ACI Standard

Hooks" in the Manual of Standard Practice CRSI current edition, unless otherwise shown on the drawings.

B. Reinforcing bars shall not be bent or straightened in a manner that will injure the materials.

C. Reinforcing bars shall conform to the dimensions shown on the plans and within the fabrication tolerances as shown in the Manual of Standard Practice CRSI current edition.

1.04 Placing Reinforcement

A. Reinforcement shall be placed in designated positions in the forms and held in place, before and during the placing of concrete by means of bar supports, to carry the reinforcing bars they support within the following tolerances from the positions shown on the drawings or specified herein:

1. For clear concrete protection and for depth "d" inflexural member, walls, and compression members where "d" is:

8 inches or less ..... ±1/4 inch
More than 8 inches but
less than 24 inches ..... ±1/2 inch
24 inches or more ..... ±1.0 inch

but the cover shall not be reduced by more than one half of the specified cover.

2. For longitudinal location of bends and ends of bars:

±2 inches except at discontinuous ends of members where tolerance shall be ±1/2 inch.

3. For spacing:

±2 inches except that total number of bars shall not be reduced.

B. Except as shown otherwise on structural drawings, concrete cover for reinforcing bars shall be as follows:

1. Cast against and permanently exposed
to earth ..... 3 inches

2. Exposed to earth and weather... 2 inches

3. Interior formed surfaces:

Piers and Columns ..... 2 inches
Beams ..... 1-1/2 inches
Walls ..... 1 inch
Slabs ..... 3/4 inch

C. Vertical bars in piers and columns shall be offset one bar diameter at lapped splices. Furnish templates for setting dowels.

D. Bars which are straight except for hooks are listed in schedules as straight bars. Lengths shown are for straight segments, not hooks.

E. "Continuous" bars unless indicated otherwise on the drawings shall be lapped 30 diameters at splices. Provide corner bars at corner conditions.

F. Splices not shown in Contract Documents shall be subject to approval.

G. Lap welded wire fabric not less than the spacing of the cross wires plus 2 inches and wire together at splices.

H. Support all reinforcing bars. Space bar supports a maximum of 4 feet on center with the first support not greater than 2 feet from the end of bars. Tie to prevent displacement during concreting operations.

I. Reinforcement shall not be "field" bent after being embedded in hardened concrete except where specifically shown on the drawings.

5.00 MISCELLANEOUS

5.01 Expansion Joints: Premolded expansion joint filler shall conform to ASTM D1751 (*6.2).

5.02 Cast In Anchors and Dovetail Slots: Provide anchors for each 8-inch (or fraction thereof) of masonry abutting concrete, at 16-inches o.c. vertical spacing. Slots shall be continuous. Slots shall be 16 gauge, galvanized, 1-inch wide back x 5/8 inch wide face x 1 inch deep (Hohmann & Barnard #305). Anchors shall be corrugated, galvanized, 1 inch wide x 5-1/2 inches long, 16 gauge, (Hohmann & Barnard #303).

5.03 Testing: The Engineer will select a recognized commercial testing laboratory. In addition to the number of cylinders required by ACI Standard 301, the Contractor shall mold and the laboratory will test one extra cylinder at 7 days, which will be solely for advance information (*Chapter 16).

5.04 Mill Test Reports: Mill test reports reinforcing steel shall be furnished by the Contractor (*16.7.4.4).

5.05 Payment: No separate payment will be made for work done or materials furnished under this section since compensation therefor shall be included in the price bid for the item to which the work pertains.

ITEM NO. 4

PIPING

1.00 GENERAL

1.01 Work Included: All labor and materials to complete all work as shown on the Plans and as specified herein.

1.02 Care of Pipe Coating and Lining: Pipe shall be so handled that the coating or lining will not be damaged. If however, any part of the coating or lining is damaged, the pipe shall be subject to rejection.

1.03 General Requirements for Alignment and Grade: The pipe shall be laid and maintained to the required lines and grades with fittings and valves at the required locations; spigots centered in bells; and all valve stems plumb. The inside of the pipe wall at the bottom of the installed pipe shall slope continuously in the direction indicated and shall be located on the invert elevations indicated within 0.01 foot for gravity piping and within 0.03 foot for all other piping.

1.04 Deviations Occasioned by Other Structures: Wherever obstructions not shown on the Plans are encountered during the progress of the work and interfere to such an extent that an alteration in the Plans is required, the Engineer shall have the authority to change the Plans and order a deviation from the line and grade, or arrange with the Owners of the structures for the removal, relocation, or reconstruction of the obstructions. If the change in Plans results in a change in the amount of work by the Contractor, such altered work shall be done on the basis of payment to the Contractor for extra work under the requirements of the General Conditions, or credit to the Owner for less work. No deviations shall be made from the line and grade without the written consent of the Engineer.

1.05 Interruption of Service: No drainage channel, storm sewer, or other utility shall be put out of service without written approval of the Engineer and/or Owner.

1.06 Construction Drawings: The term construction drawings shall mean drawings, prints, descriptive literature, test reports, samples, calculations, schedules, material lists and information and items of similar meaning.

A. Submittals Required: The Contractor shall furnish to the Engineer and Authority for review in accordance with the procedure outlined below, drawings and descriptive literature for all manufactured or fabricated products. Additional information such as special drawings, schedules, calculations and curves, shall be provided as specifically requested by the Engineer and/or Authority.

B. Contractor's Review: The Contractor shall review and check drawings and submittals. He shall indicate his approval by initials and date. The Contractor shall furnish the Engineer with a minimum of five copies of all submittals. A transmittal form shall accompany each submittal or group of submittals.

C. Engineer's Review: All submittals will be reviewed, stamped, and dated by the Engineer

before they are returned to the Contractor. Acceptable submittals will be approved in writing with one copy returned to the Contractor and the remaining copies retained by the Engineer. Submittals requiring minor corrections before being acceptable will be so noted. Drawings must be resubmitted for review and approval prior to installation or use of products.

D. Drawings for Construction: Drawings or other submittals not bearing the Engineer's review notation shall not be issued to subcontractors or utilized for construction purposes. The Contractor shall maintain at the job site a complete set of construction drawings bearing the Engineer's review.

1.07 Threads: American Standard Pipe Thread shall be used for I.P.S. threaded work. No screwed pipe joints shall be caulked or connected with rope or packing of any kind. Burrs formed by cutting tools shall be reamed out and, before installation, each section of pipe shall be examined to see that it is clean and clear. Pipes shall be free from tool marks. When erecting plated, polished, or soft-metal piping, friction wrenches shall be used exclusively. In "marking up" screwed joints, Crane or Key White thread lubricant shall be used and applied to male threads only.

1.08 Supports and Anchors: Pipe supports, unless otherwise shown on the Plans, shall be provided at the base of all risers, at intervals not to exceed 5 feet on all runs of pipe 2 inches and smaller in diameter. Pipe run in groups shall be spaced equally and kept parallel throughout the length of the run. Pipe abutting walls or ceilings shall be supported by Unistrut P1000 channels, Figure 650 pipe clamps and hanger rods if necessary.

For pipe over 2 inches, hangers shall be Grinnel Company No. 260.

For pipe 2 inches and less, hangers shall be Grinnel Company No. 97. All items shall be galvanized.

Pipe supports shall be Grinnel Company No. 264, complete with proper size extension pipe and floor flange.

Expansion bolts and inserts driven into concrete slabs for pipe hangers shall be installed without injury to the structure.

Anchorage shall be provided for fittings where there is danger of pulling joint when under pressure.

1.09 Governing Standards: All products and work shall be in accordance American Water Works Association (AWWA) standards. In the absence of AWWA standards, work and materials shall comply with applicable American Society for Testing and Material (ASTM), American National Standards Institute (ANSI), National Sanitation Foundation, or other recognized standards. Latest revisions of all standards are applicable. All new pipes and related products must shall conform to ANSI / NSF Standard 61. If requested by the Authority, submit evidence that manufacturers have consistently produced products of satisfactory quality and performance for a period of at least two years.

2.00 MATERIALS

2.01 General: Piping material shall be as herein specified unless otherwise shown on the Plans. Standard Specification designations shall be the latest published designations.

2.02 Steel Pipe: Pipe 6 inches in diameter and smaller shall be designated black steel pipe (BS), galvanized steel pipe (GS), and Schedule 80 seamless steel pipe (Sch 80 Seamless) and shall be manufactured in accordance with ASTM A-120. The minimum class pipe shall be as designated in the Plans.

Fittings shall be 125 pounds and threaded, unless otherwise shown on the Plans. Unions larger than 3 inches shall be standard flanged unions. Welded fittings shall conform to ASTM A-234 with a wall thickness equal to or greater than the pipe wall. Mitered fittings shall conform to AWWA C-208. Flanges shall be ASA-150. Welding shall be in accordance with AWWA C-206.

Pipe larger than 6 inches shall be designated STL and shall be manufactured in accordance with AWWA C-201 or 202. Fittings shall be steel welded fittings ASTM C-208. Flanges shall be in accordance with AWWA C-207, hub type. Welding shall be in accordance with AWWA C-206.

Pipe 6 to 12 inches shall be Schedule 40; 14 to 28 inches shall be Schedule 10; and 30 inches and larger shall have a wall thickness of 5/16 inch (0.312").

2.03 Cast Iron Pipe Fittings (CIP): Fittings shall be in accordance with ANSI A-21.10 and AWWA C-110 for mechanical joints, ANSI A-21.11 for lock-type push-on joints and ANSI B-16.1 for flanged joints. Sizes 3 inch through 12 inch shall have a pressure rating of 250 psi minimum and sizes 14 inch and larger shall have a pressure rating of 150 psi minimum.

Flexible couplings shall be sleeve type with the middle stop removed. Couplings located underground shall be Smith-Blair 431 for the sizes provided therein. Otherwise, underground couplings shall be Smith-Blair 411 or Dresser Style 38 with a fusion epoxy coating. Above ground couplings shall be Smith-Blair 411 or Dresser Style 38. Flanged coupling adapters, with anchor studs and/or harnesses as indicated on the Plans, shall be Smith-Blair, Type 912 or Rockwell International, Type 913, for nominal diameters from 3 to 24 inches. Anchorage across flexible couplings with bent rods will not be permitted

2.04 Ductile Iron Pipe (DIP): Pipe shall be centrifugally cast ductile iron with the pipe barrel meeting all quality requirements of AWWA Specification C-151. Ductile iron pipe shall have a bituminous coating inside and outside, in accordance with AWWA C-104 standard thickness. Mechanical joint and lock-type push-on joint pipe shall be as designated on the Plans and in no case less than Class 50. Flanged ductile pipe shall be Class 53 minimum for sizes 3 inch through 18 inch and Class 55 for 20 inch and larger sizes.

All fittings shall be mechanical joint for underground piping and flanged joint for above ground piping. All standard fittings shall have a minimum Class 53 wall thickness rating. Compact "short body" fittings shall meet ANSI A-21.53 standards and shall be Class 54 minimum. all fittings shall have a minimum 350 psi pressure rating.

2.05 Copper Pipe (CU): Copper pipe shall be ASTM B-88-51, Type L. Pipe ½ inch in diameter and larger shall be "hard-drawn" and smaller than ½ inch shall be annealed. Fittings ½ inch and larger shall be streamline solder joint fittings and smaller than ½ inch shall be flared. Connections to

other piping, tanks, and pumps shall be made with dielectric unions.

In "making up" joints in copper tubing lines, only torches for that purpose may be used. Common blow torches will not be permitted.

2.06 Polyvinyl Chlorine Pipe (PVC): Polyvinyl chloride pipe for chlorine and chemical solutions shall conform to Commercial Standard CS207-60, Type 1, with a minimum wall thickness corresponding to Schedule 80 unless otherwise shown on the Plans.

All joints above ground shall be screwed and sufficient unions shall be used, so the piping can be disassembled without the need to cut pipe.

For buried water lines, all newly installed pipes and related products must conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI as required by 290.44(a)(1) of the TCEQ rules. All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 200 psi or a standard dimension ratio of 21 with single rubber gasket push-on joints or less as required in 290.44(a)(2) of the TCEQ rules. All 6" and 8" PVC pipe shall meet all requirements of AWWA C-900, SDR 18 with rubber gasket push-on joints.

2.07 Polyethylene Pipe (PP): Unless stated otherwise in the plans, water laterals or service connections shall be constructed using class 200, SDR 9 polyethylene which meets or exceeds P3408, ASTM D-2737 (latest revision) and has NSF approval for potable water systems.

2.08 Gaskets: All gasket materials shall be Crane's "Cranite" 1/16 inch asbestos sheet packing. Gaskets shall be coated with thread lubricant when being installed. Flange bolts shall conform to ASTM A-307.

2.09 Galvanized Steel Pipe (GS): Pipe 6 inches in diameter and smaller shall be schedule 80 seamless steel pipe manufactured in accordance with ASTM A-120. Fittings shall be 125 pounds and threaded with American Standard Pipe Thread, unless otherwise shown on the Plans.

2.10 Gate Valves (GV): Gate valves shall be mechanical joint end, double disc, parallel seat, iron body, bronze mounted, non-rising stem with O-ring stem seals, open left. Gate valves 3" through 12" shall be designed for a water working pressure of 200 psi and a test pressure of 400 psi. Valves 14" and larger shall be designed for a water working pressure of 150 psi and a test pressure of 300 psi. Valves 4" through 12" will be designed for installing in a vertical position. Valves larger than 14" will be designed for a horizontal installation and equipped with bevel gearing, gear case, tracks, rollers, scrapers and by-pass valves. Gate valves shall conform to AWWA standard specification C-500, latest revision for "Ordinary Water Works Service" and shall be Mueller No. A2380-20, American- Darling No. 55, or an approved equal.

2.11 Backflow Preventers: Backflow preventers shall be the reduced pressure type providing protection during the emergency conditions of either back siphonage or backpressure or a combination of both. Backflow preventers shall be certified by a nationally recognized testing laboratory as conforming to current requirements of NSF/ANSI 372, ASSE® Listed 1013, ASSE 1013, AWWA C 506, or USC-FCCC. The installation shall meet all applicable State and local codes.

Sizes 3/4-inch through 2-inch shall have bronze bodies with threaded connections and bronze union on either side of the device.

Sizes 2-1/2 inch and larger shall be bronze or iron bodies with corrosion resisting moving parts and trim and flange connections.

The device shall be equipped with three leak-proof test cocks. A fixed air gap, or funnel, shall be installed at the relief port. A drain line shall be piped from the discharge side of the air gap and shall be supported independently from the device. An auxiliary check valve and strainer shall be installed up stream of the device. Gate valves shall be installed upstream and downstream of the device. Backflow preventers shall be manufactured by Zurn Wilkins (Model 375 AST), Watts (No. 909 Series), Hersey, or equal.

2.12 Corporation Stops: Corporation stops shall be ground key type; shall be made of bronze conforming to ASTM B 61 or B 62; and shall be suitable for the working pressure of the system. Ends shall be suitable for solder-joint, flanged lead joint, or flared tube compression type joint. Threaded ends for inlet and outlet of corporation stops shall conform to AWWA C 800; coupling not for connection to flared copper tubing shall conform to ANSI B16.26.

2.13 Valve Boxes (VB): All gate valves shall be equipped with valve boxes. Valve boxes shall be heavy roadway type. The valve boxes shall be cast iron two-piece slip or screw type with drop covers. The valve boxes shall be adjustable to 6 inches up or down from the nominal required cover over the pipe. Typical valve setting details are shown on the plans.

2.14 Tapping Sleeves and Valves (TS&V): Tapping sleeves shall be of the split sleeves, mechanical joint type. Valves shall be gate valves furnished in accordance with the specifications shown above, with flanged connection to the tapping sleeve and mechanical joint connection to the branch pipe. The necessary bolts, glands, and gaskets shall be furnished. Tapping sleeves shall be Mueller No. 615 or equal. Tapping crosses shall be Mueller No. 715 or equal. Tapping valves shall be Mueller No. 667 or equal.

2.15 Tapping Saddles: Tapping saddles shall be ductile iron body type with O-ring gasket and alloy steel straps. Connection shall be flanged or mechanical joint as required.

2.16 Fire Hydrants (FH): All hydrants shall be Mueller A-423 Centurians conforming to the requirements of AWWA C 502 for 150 psi working pressure. Hydrants shall be the compression type, closing with line pressure with a minimum valve opening of 5-1/4".

In the event of a traffic accident, the hydrant barrel shall break away from the standpipe at a point above grade and in a manner which will prevent damage to the barrel and stem, preclude opening of the valve, and permit rapid and inexpensive restoration without digging or cutting off the water.

The means for attaching the barrel to the standpipe shall permit facing the hydrant a minimum of eight different directions. Hydrants shall be fully bronze mounted with all working parts of bronze. Valve seat ring shall be bronze and shall screw into a bronze retainer. All working parts, including the seat ring shall be removable through the top without disturbing the barrel of the hydrant. The operating nut shall match those on the existing hydrants. The operating threads shall be totally enclosed in an operating chamber separated from the hydrant barrel by a rubber O-ring

stem seal and lubricated by a grease or oil reservoir. A stop nut shall be positioned in the top operating mechanism so that the valve cannot contact the bottom of the shoe when fully open.

Hydrant shall be a non-freezing design and provided with a simple, positive, and automatic drain which shall be fully closed whenever the main valve is opened. Hose and pumper connections shall be breech-locked, pinned, and then caulked with lead; or threaded and pinned, to seal them permanently into the hydrant barrel. Each hydrant shall have two 2-1/2 inch hose connections using local fire district's Standard Threads, and one 4 inch pumper connection with National Standard threads. Equip each connection with cap and chain. Hydrants shall be furnished with a mechanical joint shoe connection to the spigot of the 6-inch hydrant lead. Minimum depth of bury shall be 4.5 feet. Provide extension section where necessary for vertical installation and in accordance with manufacturer's recommendations. All outside surfaces of the barrel above grade shall be painted with Koppers Glamortex 501 enamel or equal in a color to be selected by the Owner.

2.16 Check Valves: All check valves for clean water shall be series 1400 wafer style silent check valves as manufactured by Val-Matic or approved equal. Check valves in wastewater applications shall be weighted lever swing checks with resilient seats and epoxy coated cast iron bodies as manufactured by Val-Matic or approved equal.

2.17 Sludge Valves: All sludge valves shall be resilient-seated, cast iron eccentric plug valves as manufactured by Val-Matic or approved equal.

2.18 Supports and Anchors: Pipe supports, unless otherwise shown on the Plans, shall be provided at the base of all risers, at intervals not to exceed five feet on all runs of pipe two inches and smaller in diameter. Pipe run in groups shall be spaced equally and kept parallel throughout the length of the run. Pipe abutting walls or ceilings shall be supported by Unistrut P1000 channels with Figure 650 pipe clamps and hanger rods if necessary. For pipe over two inches, hangers shall be Grinnel Co. No. 260. For two inches and smaller, hangers shall be Grinnel Co. No. 9 (Galvanized). Pipe supports shall be Grinnel Co. No. 264, complete with proper size extension pipe and floor flange. Expansion bolts and inserts driven into concrete slabs for pipe hangers shall be installed without damaging the structure. Anchorage shall be provided for fittings where there is a danger of pulling joint when under pressure.

2.19 Pressure Reducing Valves (PRV): The Pressure Reducing Valve shall maintain a constant downstream pressure regardless of changing flow rate and/or inlet pressure. The valve shall be hydraulically operated, single diaphragm-actuated, globe or angle pattern with a ductile iron body. The valve shall consist of three major components: the body, with seat installed; the cover, with bearings installed; and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve designed to permit flow when controlled pressure is less than the spring setting. The pilot control is held open by the force of the compression on the spring above the diaphragm, and it closes when the delivery pressure acting on the underside of the diaphragm exceeds the spring setting. The pilot control system shall include a fixed orifice. No variable

orifices shall be permitted. The pilot system shall include an opening speed control on all valves as standard equipment. All PRVs shall be Cla-Val 90-01

3.00 PLUMBING

3.01 General: The Contractor shall furnish and install all piping, valves, fittings, and accessories to provide a complete plumbing installation as shown on the Plans and as specified. All materials shall be new and undamaged, and shall conform to the Specifications and to applicable codes.

3.02 Rules and Regulations: All work and materials shall be in full accordance with the latest rules and regulations of the National Fire Prevention Association and the State Fire Marshal; the safety orders of the State Division of Industrial Safety; the National Electric Code; the Uniform Plumbing Code published by the Western Plumbing Officials Association; and other applicable local or state laws or regulations. Nothing on the Plans or in the Specifications is to be construed to permit work not conforming to these codes.

When the Specifications call for materials or construction of a better quality or larger size than required by the above mentioned rules and regulations, the provisions of these Specifications shall take precedence over the requirements of the said rules and regulations.

The Contractor shall furnish, without any extra charge, any additional material and labor when required by the compliance with these rules and regulations, though the work may not be mentioned in these particular Specifications or shown on the Plans.

Spaces are provided in the design for the construction of the building to install the plumbing work and the Contractor shall keep all pipe within the furring lines established on the Plans, unless pipes are shown exposed.

All pipes shall be run in the approximate locations shown and shall be of sizes given on the Plans. Unless otherwise shown, pipelines shall be run parallel to, or at right angles to, the structure. Piping must be offset wherever necessary to obtain head room. In all cases, pipelines shall be installed to conform to the actual conditions found in the building such as offsetting to clear structural members, etc.

Holes for pipes through walls, domes, or ceiling shall be lined with 24-gauge galvanized steel sleeves with ½ inch flanges on each end. where pipes pass through walls, ceilings, or floors, they shall be fitted (in lavatory and chlorine rooms) with chrome-plated plates. Plates must be securely held in position allowing enough clearance for expansion.

Pipes through the roof shall be flashed and made watertight using SEMCO 6 pound seamless lead flashing with 6 inch shirt-and-caulk type counter flashing sleeve.

Wherever changes in sizes of piping occur, the changes shall be made with reducing fittings, as the use of bushings will not, in general, be permitted. Eccentric reducing fittings shall be used wherever necessary to provide free drainage of lines.

All "horizontal" drain pipes within the building shall have a minimum of 1/4 inch pitch per foot, unless otherwise marked or required to obtain the indicated inverts.

Cleanouts shall be installed where required or where indicated on the Plans. No cleanouts or valves shall be installed in inaccessible places. Where valves, traps, or cleanouts are installed in furred ceilings or walls, the Contractor shall furnish and install access plates and frames in the furring. Traps shall be capable of being disassembled without cutting the pipe.

The Contractor shall thoroughly clean all plumbing fixtures and trim free from rust, dirt, etc., before any covering or painting is done or the system put in readiness for final inspection.

The Contractor shall protect all vitreous-finished surfaces or fixtures with heavy paper plaster hereon, or by other means, throughout the period of construction.

The piping system shall be flushed out until it is thoroughly clean in the judgment of the Engineer.

All openings into pipes shall be effectively capped to keep foreign matter out while under construction.

After the completion of all work, all resulting debris shall be removed to leave the entire work in a complete and undamaged condition and the system adjusted to proper operation.

3.03 Materials:

Fixtures: Fixtures are specified on the Plans.

Floor Drains and Traps: Floor drains shall be cast iron as manufactured by number as shown on the Plans. Traps shall be cast iron and shall be installed as near as possible to the unit which they service.

Dielectric Fittings: Shall be provided wherever dissimilar metals are connected.

4.00 INSTALLATION OF PRESSURE LINES:

4.01 General All pipe and fittings shall be carefully examined for defects and no piece shall be installed which is shown to be defective. Special care shall be taken to avoid leaving bits of wood, dirt and foreign particles in the pipe.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. In the trench to prevent getting earth into the pipe, the Engineer may require that, before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is made to the adjacent pipe. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer.

Pipe shall be laid with the bell ends or coupling ends facing in the direction of the laying unless directed otherwise by the Engineer or specifically indicated on the Plans.

All pipe shall be carefully placed and supported at the proper line and grade, and shall be sloped

to permit drainage. Minor adjustment may be necessary to avoid architectural and structural features. Major relocations shall be approved by the Engineer. Minimum earth cover shall be 30 inches, unless otherwise shown on the Plans.

Sufficient screw unions, flanges, joints, or flexible couplings shall be used to allow the convenient removal of any run of pipe without removing adjacent runs or equipment. Where practicable, make-up joints have been indicated on the Plans; however, omission of these joints from the Plans does not excuse the Contractor from their installation. Wherever a pipe larger than 3 inches in diameter is cast or grouted in place and passes from concrete to earth, a flexible coupling must be used on the earth side. Bare metal pipe passing from concrete to earth shall be wrapped with Scotch Wrap 60 for 3 inches each side of the concrete face on the earth side. All metal pipe below ground shall be wrapped with 4-mil polyethylene.

5.00 INSTALLATION OF GRAVITY LINES:

5.01 General: Wherever possible, the Contractor shall avoid the distribution of pipe to the trench site too far in advance of the laying operations. The Contractor shall exercise care in the unloading of the pipe so as to avoid damage caused by the unloading operations.

Immediately preceding the laying of a length of sewer pipe, it shall be visually checked for damage, defects, and to ensure that the inside of the pipe is clean and free from debris.

Both bell and spigot shall be clean before the joint is made, and care shall be taken that nothing but the joint-making material enters the joint.

If water is encountered in the trench, it shall be kept below the bottom of the bell of the pipe. Should the water, through neglect or otherwise, rise in the trench before the jointing operation is completed, the annular space in all pipe so affected shall be freed of all water and foreign matter and thoroughly cleaned before completing the jointing operation.

When pipe laying is not in progress, the forward end of the pipe shall be kept effectively closed with an approved temporary barricade.

6.00 CLEANING, DISINFECTION AND TESTING

6.01 General: Pressure and gravity lines shall be cleaned of all foreign matter and tested in the presence of and to the satisfaction of the Engineer. Leakage shall be corrected or, in the case of the sewer lines, shall be brought within the allowable limit at the Contractor's expense.

The Contractor shall furnish the necessary pumps, labor, equipment and materials and shall perform the required tests of the completed system before the system is placed in operation or connected to other lines.

6.02 Cleaning: The gravity and pressure lines shall be flushed clean prior to testing or disinfection.

6.03 Disinfection: Potable water systems shall be disinfected in accordance with AWWA C-651 "Procedure for Disinfecting Water Mains."

6.04 Testing: Testing shall be in accordance with TCEQ rules and guidance.

6.05 Water Mains: All testing of pipe shall be done under the supervision of the Inspector. The test section shall be bled of air and presoaked in a manner and for a time determined by the Inspector. The Contractor shall furnish all equipment and materials for the testing and shall perform such tests as follows:

a) Duration: The duration of the hydrostatic test shall be a minimum of four (4) hours.

b) Pressure: The test pressure shall be 150 psi actual hydrostatic pressure on the lowest point in the test section. The pressure gauge shall be no more than 30 feet above or below the lowest point; the gauge reading shall compensate for the actual difference in elevation and any movement (change in elevation) of the gauge shall necessitate beginning the test again. The actual hydrostatic pressure shall not exceed 155 psi at any time and not be less than 145 psi for more than 15 minutes. Every effort will be made to maintain an average pressure of 150 psi at the lowest point in each test section throughout the test.

c) Allowable Leakage: The maximum allowable leakage for push-on joints is the number of gallons per hour as determined by the following formula:

$$Q = \frac{(L)(D)(P)\,0.5}{148{,}000}$$

where: Q = Quantity of makup water in gallons/per hour
L = Length of pipe section being tested in feet
D = Nominal diameter of the pipe in inches
P = Square root of the average test pressure during the hydrostatic test in psi.

d) Filling Rates: Maximum filling rates in gallons per minute equivalent to filling velocities of 1 foot per second, for pipes flowing full.

Nominal Size	Flow Rate Q (gpm)
4	9.8
6	14.7
8	19.6
10	24.5
12	29.4
14	34.3
16	39.2
18	44.1
20	49.0
24	58.8
27	66.1
30	73.4
33	80.8
36	88.1
42	102.8
48	117.5

6.06 Air Piping: Air piping shall be tested for a period of four (4) hours at 100 psi or 1.5 times the operating pressure. There shall be no drop in pressure allowed.

6.07 Chlorine Solution Piping: Chlorine solution piping shall be tested with air for a period of four (4) hours at a pressure of 100 psi. There shall be no leakage allowed.

6.08 Gravity Lines: The pipeline shall be completely filled with water for its complete length or by sections as determined by the Engineer. If tested for its complete length, the maximum head at any point shall not exceed 25 feet unless otherwise indicated. If tested in sections, the manholes in the test section shall be completely filled with water. After the pipeline has been filled and allowed to stand for 24 hours, the amount of exfiltration shall be calculated. any amount in excess of 200 gallons per inch of inside pipe diameter per mile per day shall be cause for rejection.

6.09 Marking Tape: Detectable mylar marking tape will be installed over all non-metallic pipelines. Care shall be taken to insure that the buried marking tape is mylar encased aluminum foil. Test data for the tape shall be provided on request.

7.00 PIPE INSULATION

7.01 Piping: All piping 2 inches and smaller, and all exposed chemical feed, water supply, washdown and copper pipelines regardless of size, shall be insulated. Split ½ inch round insulation shall be used with a split PVC pipe covering utilizing galvanized metal straps as required. For piping that is not straight run, the insulation shall be pre-molded sectional urethane with aluminum wrap.

7.02 Valves: Valves and flanges which are an integral part of insulated lines shall be insulated with prefabricated urethane insulation covers as manufactured by Southwest Insulators, Inc. Covers shall be wired in place. All voids shall be made solid by pouring liquid urethane in the valve and flange covers. The covers shall be finished with black glass fab and sealed with a coat of Foster 60-26 weatherproofing. Refer to Plans for those valves larger than 2 inches that require insulation.

8.00 MEASUREMENT AND PAYMENT: No separate payment for work performed under this item. Include cost of same in contract prices bid for item of which this work is a component part, or include in yard piping.

ITEM NO. 5

WASTEWATER TREATMENT PLANT

1.00 GENERAL

1.01 General: The equipment manufacturer shall furnish for installation One (1) activated sludge treatment unit including all necessary equipment required for operation as described in these specifications. The new train consisting of aeration basin, clarifier, and sludge holding shall be designed to treat 100,000 gallons per day (GPD) of raw residential sanitary sewage containing 250 mg/l BOD_5 and 200 mg/l TSS with a two hour peak flow of 3 Q.

1.02 Principal Equipment: The principal items of equipment to include all process piping (including valves), scum, sludge collection, waste sludge pump, air supply and distribution system, chlorination system, flow metering with recording capabilities, and any accessory equipment included as a part of this specification. All equipment covered in this specification shall be furnished by a single manufacturer regularly engaged in production of this type equipment. The manufacturer shall be solely responsible for integrating all systems into a working system and shall be responsible for all startup and warrantee.

1.03 Regulatory Compliance: All equipment shall also be furnished to the engineer's specifications, and in accordance with applicable Texas Commission on Environmental Quality (TCEQ) Chapter 217 Design Criteria and the National Electric Code.

2.00 STRUCTURE

2.01 General: The plant shall be divided into zones as shown on the drawings. Steel plate and shapes shall be structural grade A-36, 1/4" minimum, and shall be joined by electric arc welding. Where required for strength or leak proofing, the weld shall be continuous and watertight.

2.02 Aeration Tanks: The inside length of the rectangular aeration/digester tank shall be as shown on the drawings.

A. Operating Water Depth: Shall be 10 feet 6 inches.

B. Volume: The volume of the aeration zones shall be as follows:

1. Aeration tank: 6,950 Ft^3

2. Digester: 2,002 Ft^3

C. Air Drops: Each tank shall have aeration diffuser droplines to provide air for mixing and proper aeration.

2.03 Clarifier: One (1) circular, flat-bottomed tank shall serve as a clarifier. Each cylindrical tank shall serve as a clarifier with center inlet and peripheral discharge. The inside diameter shall be 18'0" and the side water depth shall be 10 feet (based on the top of grout at outside of tank to mean water level). Overflow rate at average daily flow shall be 133 gallons/day/square foot. An influent-loading well of 4 diameter by 6' tall shall be provided to dissipate influent velocity and prevent short-circuiting. A 6" loading pipe shall be installed from the aeration zone to the loading well. The manufacturer

shall furnish a 8" gate valve on the inlet to the loading pipe to allow drawing of clarifier for service without draining the aeration tank.

A. Grout: The bottom of the clarifier shall be concrete with grout fill conforming to a 1 to 24 slope as shown by the drawings. The general contractor, using the collector as a guide for final finishing shall install the concrete.

B. Equipment: The equipment manufacturer shall provide mechanical sludge and scum collector. The collector arms shall be driven by a triple reduction gear system. The system shall consist of a single reduction worm gear drive with a flange-mounted motor, clutch with adjustable spring loaded adjustment, and planetary main gear drive.

1. Gear drives used in this system shall be commercial drives with parts locally available from PT distributors. The equipment manufacturer shall guarantee that parts and service are available with a 50-mile radius of this installation.
2. The output shaft of the main gear drive requiring no external bearings shall support the entire collection assembly.
3. The gear drive shall be equipped with a "zero speed" sensor to automatically disconnect illuminate an alarm light should the drive cease to rotate for any reason.
4. Scum collection shall be via skimmer arm with flexible wiper which deposits scum in a full width collection box with beach for removal by airlift pump.

C. Sludge Collection: Sludge Collection shall be via adjustable PVC scrapers at the bottom of the clarifier. Blades shall be attached to the support arms, arranged to convey settled sludge to a center collection hopper. Sludge from the hopper will be air lifted to the Aeration Zone in the normal mode.

D. Weir: Clarified liquid shall pass over an adjustable weir plate into the effluent trough. The weir shall be 11-gauge stainless steel plate. The effluent trough shall be an integral part of the clarifier wall as shown on the drawings. A scum baffle shall be installed inside the weir plate.

E. Airlift Pumps: Airlift pumps for sludge and scum shall be sized as shown under PIPING.

2.04 Access Walkway: Prefabricated walkway shall be provided for access to the clarifier drive unit. and to cover the entire area of aerated tanks. The structure shall be adequate for concentrated loads at the drive mechanism as well as live and dead encountered during normal operation (minimum 150 # lineal foot live load). Continuous handrails shall be provided around clarifier walkway a periphery of aeration tanks, walkway surface shall be 1x1-1/8" galvanized bar grate.

The aeration tanks and effluent holding tanks shall be completely covered with grating the same as used on the clarifier bridge.

2.05 Air Supply and Distribution: The equipment manufacturer shall provide three (3) blowers as manufactured by FPZ each blower shall be rated at 471 CFM @ 4.5 PSI, Model Number K09-MS. Blowers are complete with 20 HP 3000 RPM 3 ph/60hz/(208) volt horizontal TEFC motors. Blowers and motors shall be furnished fully assembled on a common steel base plate for installation on rack on side of treatment plant tank as shown. Each blower combination shall be complete inlet filter silencer, pressure relief valve, and flexible piping connections.

Air distribution on the plant shall be via steel pipe. (Plastic pipe shall not be allowed for air distribution or drop pipes.) Diffusers for process air shall be connected to the main Air Header through removable droplines located as shown on drawings. Diffusion devices shall be coarse bubble type with a minimum oxygen transfer efficiency of 5% at 20 CFM. The diffuser material shall be 304 stainless steel and inert. The drop pipe shall consist of galvanized schedule 40 steel pipe and be removable by one man without the use of hoists. Diffuser submergence shall be 9-6".

Diffusers shall be of the sparger type and have six air release slots designed to be non-fouling. Diffusers shall include defector plate to increase diffuser efficiency. Each drop line shall include clean out tee, which will permit "rodding" from above to clear any blockages

3.00 PIPING:

3.01 Piping: All piping required for the process located inside the limits of the plant structure shall be furnished by the manufacturer. Pipe stub-outs shall be provided to the exterior wall for connection to the external piping. Pipe sizes shall be as follows:

A. Influent: 8"

B. Effluent: 8"

C. Clarifier Loading: 8"

3.02 Airlift Pumps: Airlift pumps shall be schedule 40 galvanized steel completed with stainless steel air supply line, valves and supports. Sizes shall be:

A. Return Sludge Airlift: 4"

B. Scum Discharge From Clarifier: 3"

3.03 Valve Operators: All valve operators and/or automatic controls shall be accessible to the operator from the walkway and/or outside wall.

4.00 CHLORINATION/FLOW METERING SYSTEM:

4.01 Chlorine Contact Tank: Inside dimensions of the chlorine contact tank shall be as shown on drawings. Steel baffles shall be furnished by the manufacturer installed in the tank to promote plug flow. Existing liquid chlorine system shall be modified to dose in the new chlorine contact chamber.

4.02 Flow Meter: Effluent flow shall be metered using ultrasonic level measurement over a "V" notch weir. Meter to be as manufactured by Seimens, Inc. and be capable of displaying flow in GPM, provide flow totalizing, and 4-20 mA signal for driving chlorine feed pump and flow recorder.

4.03 Flow Recorder: Flow recorder shall be as manufactured by Honeywell, Model DR 4500. Charts shall be 12" circular and shall be programmable to allow operator to print charts from as little as 8 hours, to a maximum of 30 days; and be capable of displaying flows of 0 to 210 GPM, also programmable to provide operator flexibility.

5.00 ELECTRICAL:

5.01 Electrical Equipment: The manufacturer shall provide the controls for the blowers, sludge scraper mechanism, and flow meter. These controls shall be enclosed in three (3) NEMA 3R panels.

6.00 PAINTING/CORROSION PROTECTION:

6.01 Painting: Fabricated steel items not galvanized or plated will be finish painted. Below water items will be coated with coal tar polyurethane, "Corothane II, moisture cure paint" specifically designed for sewage treatment plant service (manufacturer Sherwin Williams, or equal).

All steel items not welded to the tank shall be hot dip galvanized or stainless steel.

ITEM NO. 6

ELECTRICAL

1.01 General Conditions: The drawings and specifications of other sections of this contract, as well as supplements issued thereto, information to bidders and pertinent documents issued by the Owner's representative are a part of these drawings and specifications and shall be complied with in every respect. All of the above documents will be on file at the office of the Owner's representative and shall be examined by all bidders. Failure to examine all documents shall not relieve the responsibility or be used as a basis for additional compensation due to omission of details of other sections from the electrical documents. The Contractor shall be responsible for visiting the site, checking existing condition, and ascertaining the conditions to be met for installing the work and bid accordingly.

1.02 Scope: The Contractor shall furnish all work, labor, tools, superintendence, material, equipment and operations necessary to provide for a complete and workable electrical system as defined by the contract documents. It is intent of the contract documents that upon completion of the electrical work, the entire system shall be in a finished, workable condition.

All work that may be called for in the specifications but not shown on drawings; or, all work that may be shown on drawings but not called for in specifications, shall be performed by the Contractor as if described in both. Should work be required which is not set forth in either document, but which work is nevertheless required for fulfilling of the intent thereof; then, the Contractor shall perform all work as fully as if it were specifically set forth in the current documents.

1.03 Definition of Terms: The definition of terms used in contract documents shall be in accordance with:

Underwriters Laboratories, Inc.
National Electrical Manufacturers Association
American National Standards Institute
Insulated Power Cable Engineers Association
National Electrical Code
National Fire Protection Association

1.04 Permits, Codes and Utilities: The contractor shall secure all permits, licenses, and inspections as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, rules, regulations and contract requirements bearing on the work. The minimum requirements of the electrical system installation shall conform to the latest edition of the National Electrical Code as well as state and local codes.

Codes and ordinances having jurisdiction and specified codes shall serve as minimum requirements; but, if the contract documents indicate requirements which are in excess of those minimum requirements then the requirements of the contract documents shall be followed. Should there be any conflicts between the contract documents and codes, or any ordinances, report these with bid. Determine the exact requirements for the utility service connections and metering facilities as set forth by the utilities that will serve the project, and pay for an perform all work as required by those utilities.

1.05 Standards: All materials and equipment shall conform to the requirements of the contract documents. They shall be new, free from defects, and they shall conform to the following standards

where these organizations have set standards:

Underwriters Laboratories, Inc. (UL)
National Electrical Manufacturer's Association (NEMA)
American National Standards Institute (ANSI)
Insulated Cable Engineers Association (ICEA)

All material and equipment, of the same class, shall be supplied by the same manufacturer unless specified to the contrary. All products shall bear UL labels where standards have been set for listing.

1.06 Shop Drawings and Submittals: Shop drawings shall be taken to mean detailed drawings with dimensions, schedules, weights, capacities, installation details and pertinent information that will be needed to describe the material or equipment in detail. Submittals shall be taken to mean catalog cuts, general descriptive information, catalog numbers and manufacturer's name.

Submit six copies for review within sixty (60) days after notice to proceed, all shop drawings and submittals as hereinafter called for. If shop drawings and submittals are not received in sixty (60) days, the Owner's representative reserves the right to go directly to the manufacturer for the information and any expense incurred shall be borne by the Contractor.

Review of submittals or shop drawings shall not remove the responsibility for furnishing materials or equipment of proper dimensions, quantity and quality; nor will such review remove responsibility for errors in shop drawings or submittals.

Failure to process submittals or shop drawings on any item and/or items specified shall make the Contractor responsible for suitability of the item and/or items, even though the item and/or items installed appear to comply with the contract.

The Contractor assumes all costs and liabilities which may result from the ordering of any material or equipment prior to the review of the shop drawings or submittals, and no work shall be done until the shop drawings or submittals have been reviewed. In case of correction or rejection, resubmit until such time as they are accepted by the Owner's representative and such procedures will not be cause for delay. After final review, supply up to six (6) copies, if requested.

Submittals and shop drawings shall be compiled from the manufacturer's latest product data. Should there be any conflicts between this data and the contract documents, report this information for each submittal and/or shop drawing. Shop drawings and submittals will be returned unchecked if the specific items proposed are not clearly marked, or if the general's approval stamp is omitted.

When requested, furnish samples of materials for acceptance review. If a sample has been reviewed and accepted, then that item of material or equipment installed on the job shall be equal in quality to the sample; if it is found that the installed item is not equal then replace all such items with the accepted sample equivalent. Materials to be submitted are as follows:

1. Motor Controllers
2. Disconnect Switches
3. Lighting Fixtures
4. Wire
5. Conduit and Fittings
6. Heat Trace Equipment

7. Wiring Devices
8. Level Transmitters
10. Control System

1.07 Acceptance and Substitutions: All manufacturers named are a basis as a standard of quality and substitutions of any equal product will be considered for acceptance. The judgment of equality of product substitution shall be made by the Engineer. Substitutions after award of contract shall be made only within sixty (60) days after the notice to proceed. Furnish all required supporting data. The submittal of substitutions for review shall not be cause for time extensions. Where substitutions are offered, the substituted product shall meet the product performance as set forth in the specified manufacturer's current catalog literature, as well as meeting the details of the contract documents.

The details on the drawings and the requirements of the specifications are based on the first listed item of material or equipment; if any other than the first listed material or equipment is furnished, then assume responsibility for the correct function, operation, and accommodation of the substituted item. In the event of misfits or changes in work required, either in this section or other sections of the contract, or in both, bear all costs in connection with all changes arising out of the use of other than the first listed item specified.

2.01 Excavation and Backfilling: The Contractor shall do all excavating and backfilling necessary for the installation of the work. This shall include shoring and pumping in ditches to keep them dry until the work in question has been installed. All shoring required to protect the excavation and safeguard employees shall be properly performed. All excavations shall be made to the proper depth, with allowances made for floors, forms, beams, piping, finished grades, etc. Ground under conduits shall be well compacted before conduits are installed. All backfilling shall be made with selected soil; free of rocks and debris and shall be pneumatically tamped in six inch (6") layers to secure a field density ratio of 90%. All excavated material not suitable and not used in the backfill shall be removed offsite at the Contractor's expense.

The Contractor shall field check and verify the locations of all underground utilities prior to any excavating. Avoid disturbing these as far as possible. In the event existing utilities are broken into or damaged, they shall be repaired so as to make their operation equal to that before the trenching was started.

Where the excavation requires the opening of existing walks, drives, or other existing pavement, these facilities shall be cut as required to install new lines and to make connections to existing lines. The sizes of the cut shall be held to a minimum consistent with the work to be installed. After installation of new work is completed and the excavation has been backfilled in accordance with above, repair existing walks, drives or other existing pavement to match existing installation.

2.02 Cutting and Patching: Cutting and patching required under this section shall be done in a neat workmanlike manner. Cutting lines shall be uniform and smooth. Concrete saws shall be used for large cuts in concrete and use core drills for small round cuts in concrete. Where openings are cut through masonry walls, provide lintel or other structural supports to protect the remaining masonry. Adequate support shall be provided during the cutting operation to prevent damage to masonry. Where large openings are cut through metal surfaces, attach metal angles around the opening. Concrete openings that are to be patched shall be filled with non-shrinking cementing compound. Finished concrete patching shall be troweled smooth and shall be uniform with surrounding surfaces.

2.03 Waterproofing: Provide waterproof flashing for each penetration of exterior walls and roof.

Flashing for conduit penetrations through built-up roofs shall be made with pitch pans filled with pitch. Conduit penetrations through poured concrete roofs shall be made with sleeves and annulus caulked. Penetrations through walls at below ground elevations shall be waterproofed by conduit sealing fittings or other methods as indicated. Interiors of raceways that are likely to have water ingress such as runs from hand-holes into below-grade installations shall have waterstops installed to prevent water from entering into installations.

2.04 Equipment Protection: The contractor shall provide suitable protection for all equipment, work and property against damage during construction and shall assume full responsibility for material and equipment stored at the site. Conduit openings shall be closed with caps or plugs during installation. All outlet boxes and cabinets shall be kept free of concrete, plaster, dirt, and debris. Equipment shall be covered and tightly sealed against entrance of dust, dirt, and moisture.

2.05 Clean-up: The Contractor shall remove all temporary labels, dirt, paint, grease and stains from all exposed equipment. Upon completion of work, clean equipment and the entire installation so as to present a first class job suitable for occupancy. No loose parts or scraps or equipment shall be left on the premises. Equipment paint scars shall be repaired with paint kits supplied by the equipment manufacturer, or with an approved paint. At completion of work all equipment interiors shall be free from dust, dirt, and debris.

2.06 Tests: All equipment shall be put through a trial run-in test to ascertain the performance complies with the intent of the specifications. All run-in tests shall be made in the presence of the Engineer.

3.01 Record Drawings: At the start and during the progress of the job, keep one separate set of blueline prints for making construction notes and mark-ups. Conduit routing and wiring runs shall be shown as constructed with each identified. All deviations from the contract documents shall be noted. A set of marked-up drawings shall be submitted for review.

3.02 Operations and Maintenance Manuals: Six (6) weeks prior to the completion of the project, compile an operations and maintenance manual on each item of equipment. These manuals shall include detailed instructions and maintenance, as well as spare parts lists. Submit six (6) copies for review.

4.01 PRODUCTS:

A. Raceways

1. Above ground conduit shall be hot dipped galvanized rigid steel and shall comply with ANSI C90.1, Federal Specification UWC-S81-D and UL Standard UL-6.

2. Below grade conduit and interior of laboratory and chemical rooms shall be non-metallic rigid PVC Schedule 40, rated 90°C and conform to NEMA TC-2 and UL-651 standards. Transitions to above ground to be made with PVC coated rigid metallic same as above.

3. Connections to motors shall be made using liquid tight flexible conduit and shall consist of galvanized flexible interlocking steel core with thermoplastic cover.

B. Conduit Fittings

1. NEMA 1 locknuts for indoor rigid metallic conduit shall be galvanized steel.

2. Outdoor field applied hubs for sheet metal enclosures shall be galvanized steel ring, nylon throat, threaded NPT insert and shall be MYERS "SCRU-TITE", or equal.

3. Conduit hubs for non-metallic enclosures shall be fiberglass polyester reinforced with galvanized steel core, complete with locknut and grounding bushing and shall be Square D Type NH, or equal.

4. Rigid metallic conduit chase nipples, slip fittings, unions, reducers shall be hot dipped galvanized steel.

5. Rigid metallic conduit grounding bushings shall be hot dipped galvanized steel with threaded hub, nylon insulated throat, and ground lug.

6. Liquid tight flexible conduit fittings shall be hot dipped galvanized steel body with internal locking ring.

C. Conduit Bodies and Boxes

1. Conduit bodies such as "C", "LB", "T" and the like pulling fittings shall be zinc coated with sand-cast malleable iron. Covers shall be gasketed cast metal with stainless steel cover screws and clamp style attachment. Furnish Crouse-Hinds Form 7, or equal.

2. Conduit bodies such as "GUA", "GUAT", "GUAL", and the like pulling/splicing fittings shall be zinc coated malleable iron with threaded cast metal zinc coated covers. All such conduit bodies shall be Crouse-Hinds GU/EA series, Appleton "GR" series, or equal.

3. Cast metal outlet boxes, pull boxes, and junction boxes whose volume is smaller than 100 cubic inches, and cast metal device boxes, shall be zinc coated sand-cast malleable iron. All boxes shall have threaded hubs. Furnish Crouse-Hinds "FD" style Condulets, Appleton "FD" style Unilets, or equal.

4. Covers for cast metal boxes shall be gasketed cast metal covers with stainless steel screws.

D. Wire and Cable

1. All conductors shall be soft-drawn, stranded annealed copper that meets ANSI 44, ASTM B3-74/38-72.

2. Insulation for all 480V conductors in sizes larger than #3/0 AWG shall be insulated with ethylene propylene rubber and shall have chlorosulfonated flame retardant outer jacket. All such wire shall be type RHH, RHW, USE, VW-1. Furnish Okonite "Okolon", Rockbestos "Firewall", or equal.

3. Insulation for all 480V conductors in sizes #3/0 AWG and smaller shall be cross-linked polyethylene. Furnish type RHH, RHW, USE wire, Okonite "X-Olene", G.E. "Vulkene", or equal.

4. All power signal-conductor cables shall be factory pigmented black insulation.

5. Insulation for all 120/240V conductors, insulated equipment grounding conductors and control conductors shall be cross-linked polyethylene. Furnish type XHHW wire, Okonite "X-Olene", G.E. "Vulkene", or equal.

6. Multiconductor shielded cables shall be polyethylene insulated tinned copper conductors within an aluminum-polyester shield tinned copper drain wire and a chrome PVC jacket. Shield shall provide 100% coverage. Cables shall be UL style 2092 and shall be Belden Beldfoil #8760, or equal, with number of conductors shown.

7. Multiconductor signal cables shall consist of pairs of insulated copper conductors, size and number of pairs as indicated cabled together using polyethylene filler cords where necessary. The cabled assembly shall be wrapped with a clear polyester tape. The integral supporting messenger shall be 1/4" (7 strand) class A galvanized extra high strength steel with a minimum breaking strain of 6650 lbs. The messenger shall be flooded with a rubber-asphalt compound for corrosion protection and shall comply with sections 10 and 11 of IMSA specifications 19-3 or 20-3. Overall jacket shall have a black sunlight resistant overall jacket. The cable core and messenger shall be assembled to form a figure 8 construction.

E. Connectors

1. Mechanical connectors shall be copper alloy bolted pressure type with bronze hardware.

2. Insulated spring-wire connectors, "wire-nuts", for small building wire taps and splices shall be plated spring steel with thermoplastic jacket. Connector shall be rated at 150°C continuous. Furnish 3M "Hyflex", T&B "PT", or equal.

3. Insulated set-screw connectors shall consist of copper body with flame-retardant plastic insulated shield. Furnish Ideal, T&B, or equal.

4. Connectors for control conductor connections to screw terminals shall be crimp-type with vinyl insulated barrel and tin-plated copper ring-tongue style connector. Furnish T&B "Sta-kon", 3M "Scotchlok", or equal.

F. Insulating Products

1. Tape products shall be furnished as hereinafter specified and shall be Plymouth, Okonite, F.E., 3M, or equal.

2. General purpose electrical tape shall be 7 mil thick stretchable vinyl plastic, pressure adhesive type, "Slipknot Grey", 3M Scotch 33+, or equal.

3. Insulating void-filling tape and high voltage bedding tape shall be stretchable ethylene propylene rubber with high-tack and fast fusing surfaces. Tape shall be rated for 90°C continuous, 130°C overload, and shall be moisture-proof. Void-filling tape shall be "plysafe", 3M Scotch 23, or equal.

4. High temperature protective tape shall be rated 180°C continuous indoor/outdoor, stretchable, self-bonding silicone rubber. High temperature tape shall be "Plysil #3455", 3M Scotch 70, or equal.

5. Insulation putty filler-tape shall be Plymouth #2074; 3M, or equal.

G. Labels

1. Colored banding tape shall be 5 mil stretchable vinyl with permanent solid color. Colors shall be as hereinafter specified. Tape shall be Plymouth "Slipknot 45", 3M Scotch #35, or equal.

2. Numbered marking labels shall be colored vinyl markers, T&B, Brady, or equal.

3. Cable identification labels shall be weather resistant polyester with blank write-on space, T&B, Brady, or equal.

4. Buried conduit marking tape for marking path or buried conduits shall be four inch (4") nominal width strip of polyethylene with highly visible, repetitive marking "BURIED CONDUIT", or similar language, along its length.

5. Nameplates shall be micarta lamicoid material, 1/6" thick, black background with white engraving. Attachment means shall be self-tapping stainless steel screws.

H. Grounding Devices

1. Exothermally welded joints shall be made with Enrico "Cadweld", Burndy "Thermweld", or equal kits.

2. Ground bus connectors shall be Square D type "LU", OZ Type "XLH", or equal.

3. Conduit grounding bushings shall be as specified under CONDUIT FITTINGS.

I. Supporting Devices

1. Mounting hardware, nuts, bolts, lock washers, and washers, shall be grade 304 stainless steel.

2. Unless otherwise indicated, slotted channel framing and supporting devices shall be manufactured of ASTM 6063, T-6 grade aluminum; 1-5/8" wide x 3/14" deep (double opening type). Clamp nuts for use with slotted channels shall be grade 304 stainless steel.

3. Conduit straps for use with slotted channels shall be aluminum with stainless steel hardware.

4. After-set concrete inserts shall consist of stainless steel expansion bolts, 1/4" minimum diameter, 500 lbs. minimum pull-out resistance. Furnish Phillips, Wej-it, or equal.

5. Hanger rod shall be 3/8" minimum diameter galvanized steel all-thread.

6. Nest-back or clamp-back conduit supports shall be two-piece hot-dipped galvanized malleable iron devices. Furnish Crouse-Hinds "MW + CB", Gedney 140 series, or equal.

7. One-hole conduit clamps shall be hot-dipped galvanized malleable iron type, Crouse-Hinds type "MW", T&B 1270/1280 series, or equal.

8. Conduit "U" bolts shall be hot-dipped galvanized steel with galvanized hex-head bolts.

9. Plastic saddles for supporting buried conduits shall be interlocking type that provides separation between conduits vertically and laterally and between bottom of conduits and trench floor.

J. Miscellaneous Material

1. Double bushings for insulating wiring through sheet metal panels shall consist of mating male and female threaded phenolic bushings. Phenolic insulation shall be high-impact "ABB", Gedney type "ABB", or equal.

2. Cable grips shall be grip-type wire mesh with machined metal support. Furnish Kellems, Appleton, or equal products.

3. Conduit pull-cords for use in empty raceways shall be glass-fiber reinforced tape with foot-marked along its length. Furnish Thomas, Greenlee, or equal products.

4. Conduit thread coating compound shall be conductive, non-galling, and corrosion-inhibiting. Furnish Crouse-Hinds type "STL", Appleton type "ST", or equal.

5. Wire pulling compound shall be non-injurious to insulation and to conduit and shall be lubricating, non-crumbling, and non-combustible. Furnish Gedney "Wire-Quick", Ideal "Yellow", or equal.

6. Plastic compound for field-coating of ferrous material products shall be PVC in liquid form that sets-up semi-hard upon curing. Furnish Rob Roy "Rob Kote", Sedco "Patch Coat", or equal.

7. Zinc spray for coating electrogalvanized steel products shall be Research Laboratory type "LPS", Mobil "Zinc-spray", or equal.

8. Splicing kit shall be provided with insulating and sealing compound to provide a moisture-tight splice. Provide Scotchcast Series 82 or equal splicing kit.

K. Lighting

1. Fixture lamps shall be furnished as scheduled and as specified.

2. Each fixture shall be complete with its appropriate hardware, finish trim, and

appurtenances as required for a finished installation.

L. Wiring Devices

1. All wiring devices shall be specification grade and shall meet NEMA WD 1-1971 requirements. Furnish following types unless otherwise indicated.

2. Two-pole, 3-wire grounding, 15A/125V, NEMA 5-15R duplex receptacle shall be Arrow-Hart #5662-S, Hubbell #5262, or equal.

3. Two-pole, 3-wire grounding, 20A/125V, NEMA 5-20R duplex receptacle shall be Arrow-Hart #5739-S, Hubbell #5362, or equal.

4. GFCI receptacle shall be single receptacle in a duplex body with upper half containing reset and test pushbuttons. Furnish Square D "GFSR", or equal.

5. Two-pole, 3-wire grounding, #20A/250V, NEMA 6-20R single receptacle shall be Arrow-Hart #5861, Hubbell #5461, or equal.

6. Single-pole, single throw, 20A toggle switch shall be Arrow-Hart #1791, Hubbell #1221, or equal.

7. Single-pole, double throw (three-way) 20A toggle switch shall be Arrow-Hart #1993, Hubbell #1223, or equal.

8. Double-pole, double-throw (four-way) 20A toggle switch shall be Arrow-Hart #1994, Hubbell #1224, or equal.

9. Double-pole, single-throw 29A toggle switch shall be Arrow-Hart #1992, Hubbell #1222, or equal.

10. Single-pole, double-throw, momentary/ centeroff, 20A toggle switch shall be Arrow-Hart #1995, Hubbell #1556, or equal.

11. Door switch, single-throw pressure sensitive shall be Pass & Seymore #1205, or equal.

M. Panelboards

1. Panelboards shall have voltage, overcurrent devices and features as indicated.

2. Breakers shall be plug-on type, trip-free. Multipole breakers shall be provided with a common internal trip which opens all poles simultaneously and with a single operating handle for all poles. Handle ties between breakers are not acceptable.

3. Breakers for 480V distribution panels shall be rated at least 14,000 amps I.C., and breakers for 120/240V panels shall be rated at least 10,000 amps I.C.

4. Provide ground bus inside each cabinet.

5. Enclosures shall be NEMA 1 surface mounted cabinet with gasketed, hinged door, inside gutter trim and with door mounted directory pocket. All metal surfaces shall be painted with baked-on acrylic enamel.

N. Dry-Type Transformers

1. Dry-type transformers shall have continuous KVA and voltage characteristics as shown.

2. Enclosures shall be indoor type.

3. Coils shall be provided with NEMA standard taps in high voltage windings.

4. Furnish Square D or equal dry-type transformers.

O. Safety Switches

1. Safety switches shall be fused or non-fused as indicated. Each fused type switch shall be equipped with class R rejection clips.

2. Switch mechanism in each safety switch shall be quick-make, quick-break, heavy-duty type that meets Federal Specification W-S-865C.

3. Enclosures shall be NEMA types as indicated. NEMA 4X types shall be fiberglass reinforced polyester with gasketed door and stainless steel hardware.

4. Conduit hubs for NEMA 4X enclosed safety switches shall be steel body type with fiberglass reinforced polyester covering and with grounding bushing inside.

5. Conduit hubs for NEMA 3 and NEMA 4 enclosures shall be water-tight threaded hubs with grounding bushing inside.

6. Each enclosure shall be equipped with ground lug.

7. Where indicated furnish disconnect mechanism with auxiliary control disconnect contact rated 10 amp make, 6 amp break 120V A.C., 35% p.f.

8. Where indicated furnish NEMA 4X safety switches with integrally mounted pilot operators.

9. NEMA 1, 3, 4 or 12 enclosed safety switches shall be Square D, or equal.

10. NEMA 4X safety switches shall be Square D "Krydon", or equal.

P. Motor Controllers

1. Enclosures shall be NEMA types as indicated. NEMA 4X types shall be fiberglass reinforced polyester with gasketed door and stainless steel hardware.

2. Each motor controller shall be as follows:

a. All motor controllers shall be full-voltage, non-reversing type except where other types are indicated. Contactors and overcurrent devices and conductors shown shall be minimum sizes, confirm all external loads prior to manufacture.

b. Each controller shall have a hinged door. Disconnect device operating handles shall have on-off positions clearly marked and each handle shall have padlocking provisions. Controller doors shall have mechanical interlocks to prevent their being opened unless the disconnect is in the "off" position; however, there shall be a defeat mechanism for authorized personnel entry.

c. Each controller shall be equipped with its own fuses and control power transformer. VA capacity of control power transformer shall be sized to handle its compartment load plus external connected loads.

d. Each controller shall be equipped with pull apart terminal blocks.

e. Each controller shall be equipped with indicated pilot operators and other devices. All pilot operators such as pilot lights, selector switches, and pushbuttons shall be oil-tight grade. Each device shall be equipped with engraved metal surround legend with functions engraved.

f. Provide one ambient-compensated overload for each motor controller. Size five and larger contactors shall have overloads fed from CT's in motor leads. Overload blocks shall be adjustable from 80% to 115% of their nominal value. Where indicated, provide overloads with auxiliary contacts. Selection of overloads shall be determined by the full load current of motor to be supplied.

g. All control relays shall be industrial type each with 10 amp, 120V rated contacts. Each contact shall be field convertible. Each relay shall have open-close position indication. Relay coils shall be rated 120VAC continuous duty, including latch type relay coils.

h. Motor branch circuit overcurrent protection shall be motor circuit protectors, unless otherwise indicated. Each "MCP" shall have adjustable current setting pickup. Minimum I.C. of each "MCP" shall be 22KA rms symmetrical amps.

5.01 INSTALLATION: The following methods shall be used on this project:

5.02 Raceways:

A. Install the conduit system to provide the facility with the utmost degree of reliability and maintenance-free operation. The conduit system shall have the appearance of having been installed by competent workmen. Kinked conduit, conduit inadequately supported or carelessly installed, do not give such reliability and maintenance-free operation and will not be acceptable.

B. Raceways shall be installed for all wiring runs except as otherwise indicated.

C. Conduit sizes, where not indicated, shall be N.E.C. code-sized to accommodate the number and diameter of wires to be pulled into the conduit. Unless otherwise indicated, 3/4" trade-size shall be minimum size conduit.

D. Unless otherwise noted, conduit runs shall be installed exposed. Such runs shall be made parallel to the lines of the structure.

E. Unless otherwise indicated, conduit runs installed below-grade in earth shall be PVC. Use manufacturer's approved cement for joining couplings and adapters. Runs shall be installed so that tops of conduits are at least twenty-four inches (24") below finished grade. Support runs on plastic spacers and backfill to three inches (3") above topmost conduits with washed sand. Wash down all sand backfill with water so as to completely fill interstices and to compact sand. Complete backfill to finished grade with selected soil that is free from clods, debris, rocks and the like. Pneumatically tamp backfill in six inches (6") to eight inches (8") below finished grade, install continuous run of "BURIED CABLE" marking tape.

F. Below-grade to above-grade upturns in non-metallic runs shall be made with plastic coated rigid metallic conduit. Install for each upturn a PVC male adaptor on each end of PVC run and thread into metallic coupling that shall be equipped with a PVC sleeve. Continue thence with plastic coated metallic conduit to at least four inches (4") above finished grade.

G. Rigid metallic conduit runs shall have their couplings and connections made with screwed fittings and shall be made up wrench-tight. Check all threaded conduit joints prior to wire pull.

H. All conduit runs shall be water-tight over their lengths of run except where drain fittings are indicated. In which cases, install specified breather-drain fittings.

I. Plastic jacketed flexible steel conduit shall be used to connect wiring to motors, limit switches, bearing thermostats, and other devices that may have to be removed for servicing. Unless otherwise indicated, maximum lengths of flex shall be six feet (6').

J. Each flex connector shall be made up tightly so that the minimum pull-out resistance is at least 150 lbs.

K. Empty conduits shall have pull-tape installed. Identify each terminus as to location of other end. Use blank plastic waterproof write-on label and write information on each label with waterproof ink. Cap exposed ends of empty conduit with plastic caps.

L. Conduit runs into boxes, cabinets, and enclosures shall be set in a neat manner. Vertical runs shall be set plumb. Conduits set cocked or out of plumb will not be acceptable.

M. Conduit entrances into equipment shall be carefully planned. Cutting away of enclosure structure, torching out sill or braces, and removal of enclosure structural members, will not be acceptable.

N. Use approved hole cutting tools for entrances into sheet metal enclosures. Use of cutting torch or incorrect tools will not be acceptable. Holes shall be cleanly cut and they shall be

free from burrs, jagged edges, and torn metal.

O. All raceways shall be swabbed clean after installation. There shall be no debris left inside. All interior surfaces shall be smooth and free from burrs and defects that would injure wire insulation.

5.03 Conduit Bodies and Boxes:

A. Conduit bodies such as "LB", "T", etc., shall be installed in exposed runs of conduit wherever indicated and where required to overcome obstructions and to provide pulling access to wiring. Covers for such fittings shall be accessible and unobstructed by the adjacent construction.

B. Covers for conduit bodies installed shall be gasketed cast metal type.

C. All conduit boxes installed shall be cast metal type. Covers for all such boxes shall be gasketed cast metal type.

5.04 Raceway Support:

A. All raceway systems shall be adequately and safely supported. Loose, sloppy and inadequately supported raceways will not be acceptable. Supports shall be installed at intervals not greater than those set forth under Article 300 of N.E.C., unless shorter intervals are otherwise indicated, or unless conditions require shorter intervals of supports.

B. Surface mounted runs of conduit on concrete or masonry surfaces shall be supported off the surface by means of aluminum slotted channels and conduit clamps. Attach each slotted channel support to concrete surface by means of two (2) 1/4" diameter stainless steel bolts into drilled expansion shields.

C. Conduit runs that are installed along metallic structures shall be supported by means of beam clamps or other methods as may be indicated. Coat each clamp with PVC prior to installation.

D. Below-grade conduits shall be supported with plastic saddles.

5.05 Wiring:

A. Conductors shall be sized as shown and where no size is indicated, the conductor size shall be #12 AWG.

B. All control wiring, 120/240V wiring and insulated equipment grounding conductors shall be type XHHW insulated stranded copper conductors.

C. All 480V wiring in sizes #4/0 and larger shall be made with type RHH, RH, USE, VW-1 wire with stranded copper conductors that has EPR insulation and flame retardant jacket.

D. All 480V wiring in sizes smaller than #4/0 shall be installed with type RHH, RHW, USE insulated stranded copper conductors.

E. Branch circuits may be spliced for receptacle, lighting and small appliances load inside appropriate junction boxes.

F. Except as otherwise specified, taps and splices with #10 AWG and smaller shall be made with insulated spring wire connectors. Such connectors in damp or wet locations shall be further insulated with an envelope of stretched piece of EPR tape around each wire to fill the interstices between the wires. Then, apply one-half lapped layer of electrical tape over all.

G. Motor connections made with #10 AWG and smaller wire shall be made up with set-screwed copper lugs with threaded-on insulating jacket. After make-up of each connector, install two (2) layers half-lapped, of high temperature tape over connector barrel and down over wires into connector one inch (1").

H. Motor connections made with #8 AWG and larger wire shall be made up with cast copper alloy splice connector. Apply over each connector and down 1.5 inches over each wire entry, wrapping if high temperature tape. Apply at least three (3) layers, half-lapped each layer of such tape with maximum build-up over the connector. Then apply final wrapping of at least three (3) layers, half-lapped each layer of electrical tape.

I. Taps, splices, and connections in #8 AWG and larger wires shall be made with copper alloy bolted pressure connectors. Each such connector shall be insulated by means of applying insulation putty over sharp edges so as to present a smooth bonding surface. Next, apply at least four (4) layers, half-lapped each layer of EPR tape. Then make final wrapping of at least three (3) layers, half-lapped each layer of electrical tape.

J. Control wiring connections to stud type and screw type terminals shall be made with ring-tongue type crimp connectors. Label each terminal jacket with wire marking label at each connection.

K. Each wire connection shall be made up tightly so that resistance of connection is as low as equivalent length of associated conductor resistance.

L. Phase label black pigmented power wires with color banding tape. Color of tape applied shall be that specified below.

Conductor	120/240V Systems	480V Systems
Phase A	Black	Purple
Phase B	Red	Brown
Phase C	Blue	Yellow
Neutral	White	Gray
Equipment Ground	Green	Green

M. Numbered marking labels shall be installed to identify circuit numbers from panelboards. Install labels on each wire in each panelboard, junction, and pull box, and device connection.

N. Label each wiring run with write-on waterproof labels inside each motor control center and in service switchboard. Install write-on label ties around wire group at conduit entrance and

write-on label the wire size, and service.

O. Install numbered marking on each control wiring termination at each terminal strip and at each device. Do this in motor control center, terminal cabinets, safety switches, remote controllers, pilot operators, and instrumentation equipment. Number selected shall correspond to number on terminal strip.

P. All wiring inside enclosures will be neatly trained and laced with nylon tie-wraps.

Q. All wiring shall be installed in raceways unless otherwise noted; however, no wire shall be drawn into a conduit until all work of a nature which may cause injury is completed. Do not exceed wire and cable manufacturer's recommended pulling tensions. A cable pulling compound shall be used as a lubricant and its composition shall not affect the conductor or its insulation.

5.06 Wiring Devices:

A. Install wiring devices where indicated. Wiring devices shall be type as indicated.

B. Each wiring device shall be set with axis plumb and installed with yoke screws so as to adequately support device yokes to the box.

C. Device boxes shall be cast metal Condulets or equal.

D. Use ganged boxes for ganged devices.

E. Each device box shall be equipped with specified cast metal cover.

5.07 Grounding:

A. Each item of equipment shall be adequately and thoroughly grounded. Comply with Article 250 of N.E.C., except where higher standards of grounding have been specified.

B. Equipment grounding conductors (EGC) shall be installed where indicated. These wires shall be green colored in sized #6 AWG and smaller and green banded in larger sizes.

C. EGC runs into equipment and shall be grounded to equipment bus where available, or to equipment ground lugs.

D. Where grounding type bushings are installed, bond EGC thereto and furthermore ground each bushing lug to equipment ground bus or ground lug, or ground rod.

E. In each motor terminal box, install equipment ground lug and connect EGC thereto.

F. In each floodlight pole, install ground connector to pole and bond to conduit bushing and to EGC in branch circuit.

5.07 Outdoor Lighting Fixtures:

A. Install anchor bolts with templates. Each anchor bolt shall be set plumb and have correct

projection above top of concrete to accommodate double nuts and base so that there shall be slight projection of each bolt above top nut when top nut is fully seated.

B. Each pole shall be set so that after tightening the nuts on the anchor bolts, they shall be plumb.

C. Conduit upcomers into pole bases shall be extended up to hand-hole level. Each conduit shall be equipped with grounding bushing. Bond each bushing lug to pole ground lug.

D. Pole riser wiring shall be made with 600V rated 3-conductor SO cord. Ground green equipment grounding conductor to pole ground lug at base and ground to luminaire at top.

E. Aim floodlighting luminaires at night for maximum coverage. Results shall be acceptable to the Engineer.

5.08 Labeling: In addition to requirements for labeling as specified throughout this section, install labels as follows:

A. Phase bank each power wire and cable with colored banding tape. do this at each termination.

B. Apply numbered wire marking labels to control wires, power wiring in panelboards, pull and junction boxes, and at outlets to identify circuit numbers. Each control wire shall be labeled at each connection.

C. Apply write-on identification labels to wiring sets in each hand-hole to identify function. Use waterproof labels.

D. Apply write-on identification labels to empty conduits to identify each with information as to terminus of other end and also trade size of conduit.

E. Install micarta nameplates with engraving to identify function and/or load served for the following:

1. Starters
2. Overcurrent Devices
3. Safety Switches
4. Panelboards
5. Motor Controllers
6. RTU's
7. Level Transmitters
8. Flow Switches
9. Heat Trace Equipment

Micarta nameplates shall be attached with stainless steel screws, use two (2) per each nameplate. Submit for review a schedule for engraving along with size for each proposed micarta nameplate. Do not fabricate nameplate until review has been completed.

6.01 Electrical Service: The Contractor will make arrangements with the Electric Utility Company to locate and provide 3-phase overhead power service at the water plant site. The Owner will pay for

all fees charged directly by the Electric Utility Company for equipment and labor supplied to provide such service. The Contractor shall schedule his work around such service availability.

7.01 Guarantee: All electrical and control equipment shall be guaranteed against defects in material and workmanship for a period of one (1) year from the date of system acceptance.

8.01 Payment: No separate payment for work performed under this item. Include cost of same in contract prices bid for all items of which this work is a component part.

ITEM NO. 7

LIQUID CHEMICAL FEED SYSTEM

1.01 Chlorination Building: NA

1.02 Chemical Feed Room Ventilation: Vents shall have bug screens and be of aluminum with adjustable damper or an FRP corrosion resistant shroud. All penetrations shall be sealed to prevent access by insects. The inlet vent opening shall be low on the opposite side as shown. The fan shall be controlled by exterior light switch.

1.03 Chemical Feed System: The Contractor shall provide and install a complete chemical feed system. The system shall/s shall consist of a Siemens Sitrans LUT 400 Series Ultrasonic Level Controller W/ an Echomax XRS-5 Ultrasonic Transmitter Upstream of the V Notch Weir on the Chlorine Contact Chamber. A Stenner variable speed, chemical feed pump Model Number SVP4H7 mounted on a shelf to inject solution into transfer line from clarifier to chlorine contact chamber. The Pump shall be flow paced based on 4-20 ma signal from ultrasonic flow meter with a spill recovery line directed back into the bulk storage tank. The Contractor shall provide all necessary piping and fittings to take suction from the proposed bulk storage tank and inject the solution into the treatment plant discharge before the ground storage tanks. A spare chemical feed pump shall be provided. The bulk storage tank shall be a 60 gallon Protank, Model # DWC 60, double wall tank with a quick connect with a Ball Valve located on the top for filling. Pump, tank, and all chemical feed system components shall be NSF 61 Approved for use in water systems. All Penetrations Shall Be Sealed to Prevent Access by Insects.

1.04 Chemical Feed Electrical: The electrical work shall comply with NEMA 1 requirements. All wire raceways shall be sealed PVC to prevent corrosion from the chlorine gas. Seal wyes shall be installed on all conduit entering the chemical room.

1.05 Payment: Payment for the materials, equipment, and labor furnished and installed under this specification shall be paid for under the Chemical Feed System Item

UNDINE, L.L.C.

BAYRIDGE WASTEWATER SYSTEM

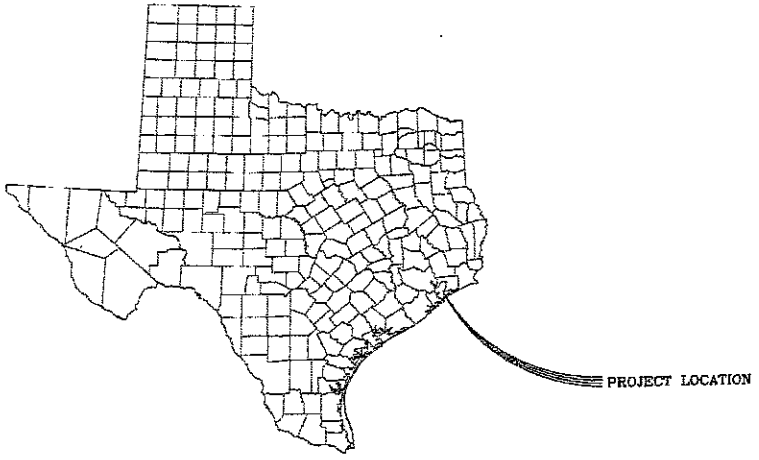
WASTEWATER PLANT IMPROVEMENTS

CHAMBERS CO., TEXAS

TPDES NO. WQ0013643001

GENERAL NOTES:

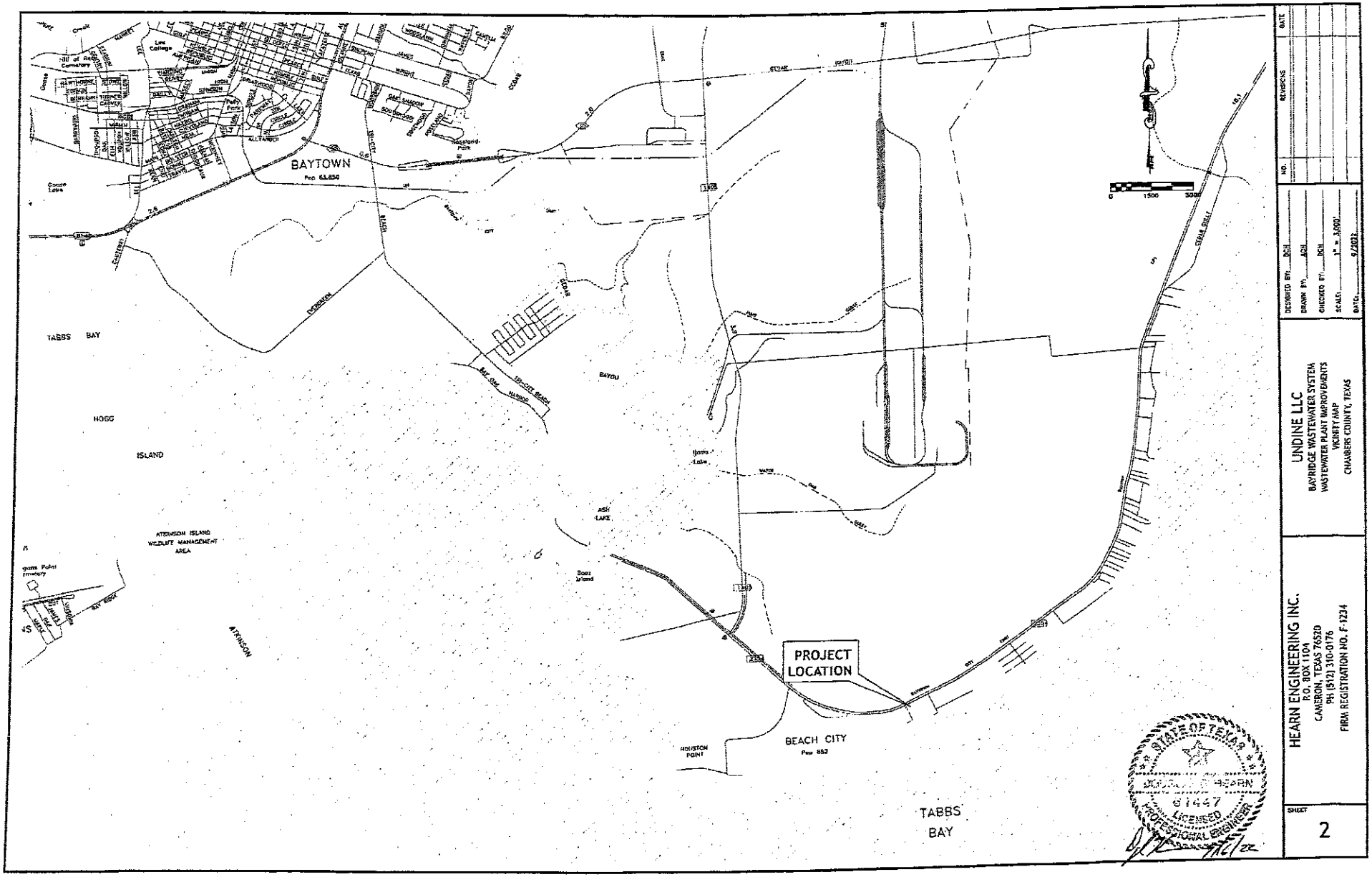
1. The contractor shall be liable for damage to improvements and utilities along the access route and at or near the worksite. Utilities may exist and not be shown on the construction drawings. The site shall be carefully scrutinized for evidence of utilities. As a minimum, prior to any ground disturbance, the number 811 shall be called to ascertain if underground utilities exist in the general work area. Calling the number will only confirm the existence of underground utilities owned by companies that subscribe to one of these organizations. There may be other underground utilities in the work area. The contractor shall notify the owners of all utilities a minimum of (10) days in advance of the intent to perform work in the affected area. The notice shall be in writing and a copy shall be furnished to the contracting officer.
2. All work shall be in accordance with TCEQ rules and regulations (chapter 290). All newly installed pipes and related products must conform to American National Standards Institute / National Sanitation Foundation (ANSI/NSF) Standard 61 and must be certified by an organization accredited by ANSI as required by 290.44(a)(1) of the rules. All plastic pipe for use in public water systems must also bear the National Sanitation Foundation Seal of Approval (NSF-pw) and have an ASTM design pressure rating of at least 150 psi or a standard dimension ratio of 26 or less as required in 290.44(a)(2) of the rules. Disinfection shall be in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service.
3. The contractor shall not attempt to determine locations by scaling from the plans. While every attempt has been made to prepare these plans to scale, the Engineer shall be consulted if clarifications are needed.
4. The contractor shall verify the location and elevations of all existing utilities prior to beginning constructed.
5. Conflicts with the proposed work shall be brought to the attention of the Engineer immediately.
6. The contractor shall notify the Engineer twenty-four (24) hours prior to beginning construction.
7. All underground fittings shall be mechanical joint restrained with Mega Lugs or other system approved by the Engineer. All above ground piping shall be flanged or threaded.
8. Proposed piping above ground shall be threaded schedule 40 G.I.P. up to 4" and schedule 40 fabricated steel or flanged D.I. for larger. All in ground piping shall be either schedule 40 G.I.P. or schedule 80 PVC.
9. Final grading shall insure proper drainage & be accomplished with top soil. once grading is completed, the area shall be revegetated with hydromulch which shall be maintained until there is a min. coverage of 90% with no area larger than ten square feet. All areas exposed construction shall be revegetated.
10. It is the intent of these plans and specifications that the contractor shall provide an installation that is complete. All items necessary, reasonably incidental or customarily included, shall be provided.



SHEET INDEX

HEARN ENGINEERING INC.
P.O. Box 1104 - Cameron, Texas 76520 - (512) 318-0176 - FIRM # F-1234

STATE OF TEXAS
D. HEARN
61447
LICENSED
PROFESSIONAL ENGINEER
7/16/12



NO.	REVISIONS	DATE

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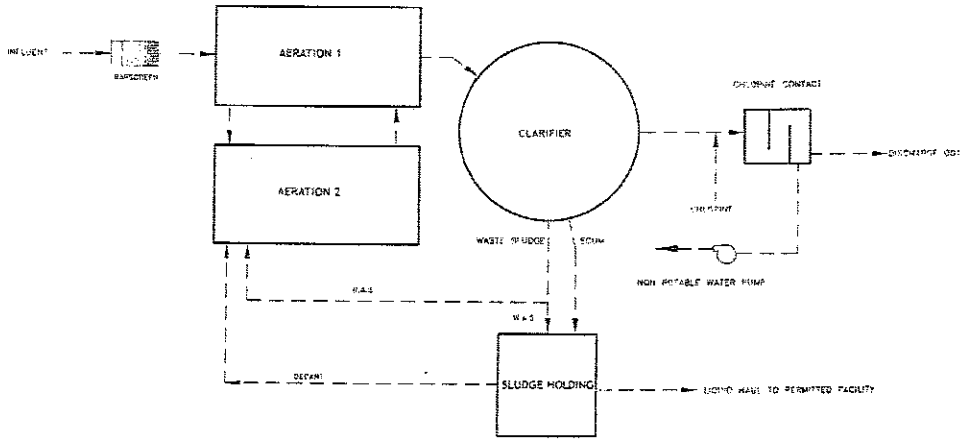
DRAWN BY: ADH
CHECKED BY: BDH
SCALE: 1" = 3,000'
DATE: 5/2022

UNDINE LLC
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
VICINITY MAP
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

STATE OF TEXAS
61447
LICENSED
PROFESSIONAL ENGINEER

SHEET
2



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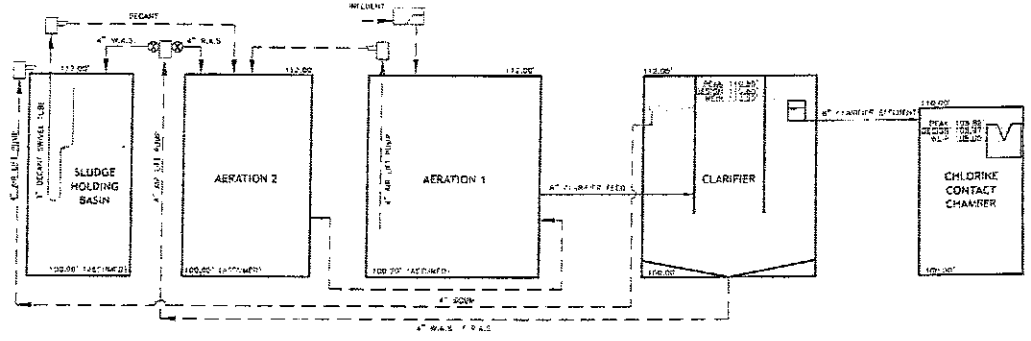


HYDRAULIC PROFILE

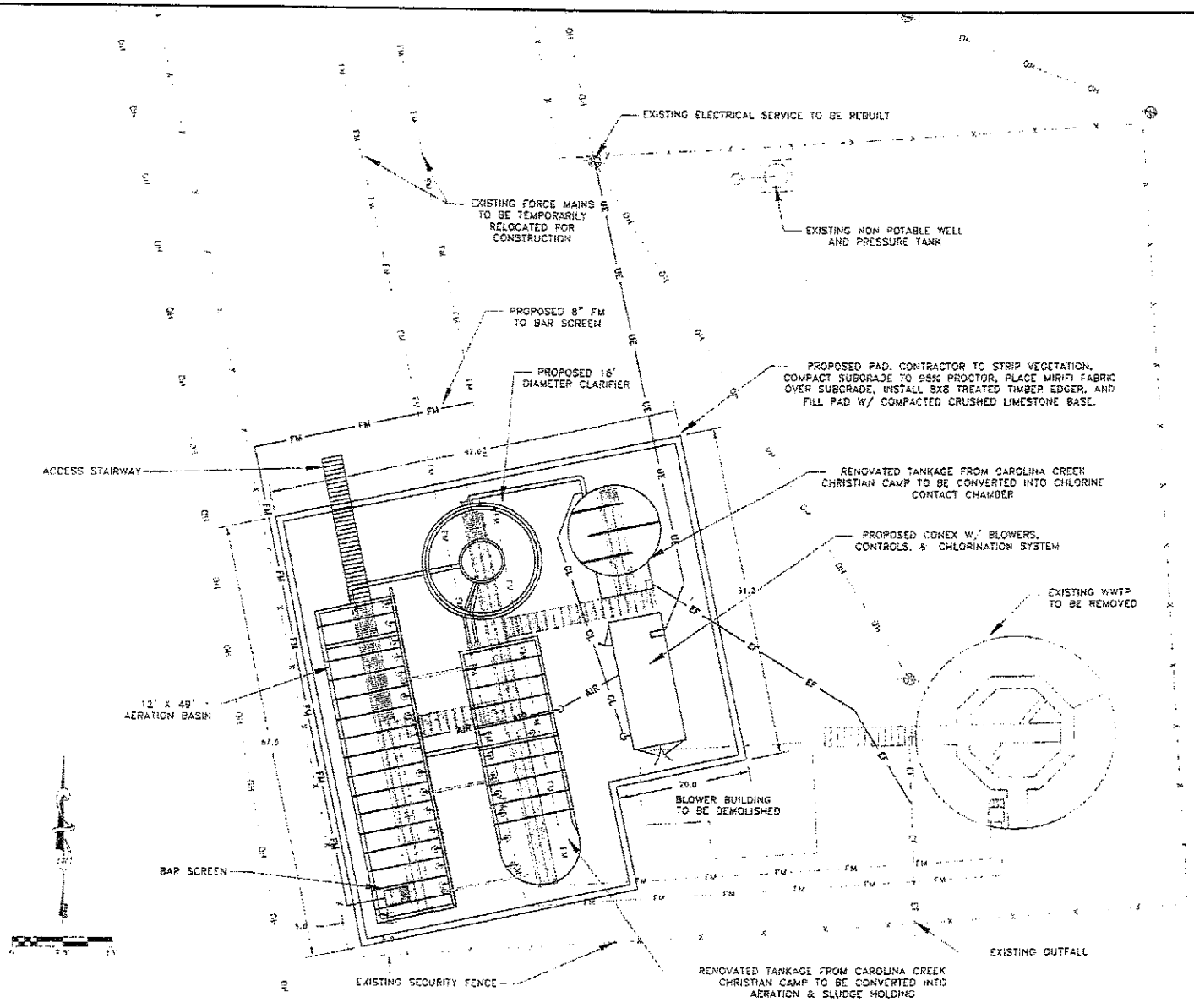
STATE OF TEXAS
PROFESSIONAL ENGINEER
9/16/22

DESIGNED BY: JDH
DRAWN BY: ACH
CHECKED BY: JDH
SCALE: N.T.S.
DATE: 9-2022

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
FLOW SCHEMATIC AND HYDRAULIC PROFILE
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

SHEET
3



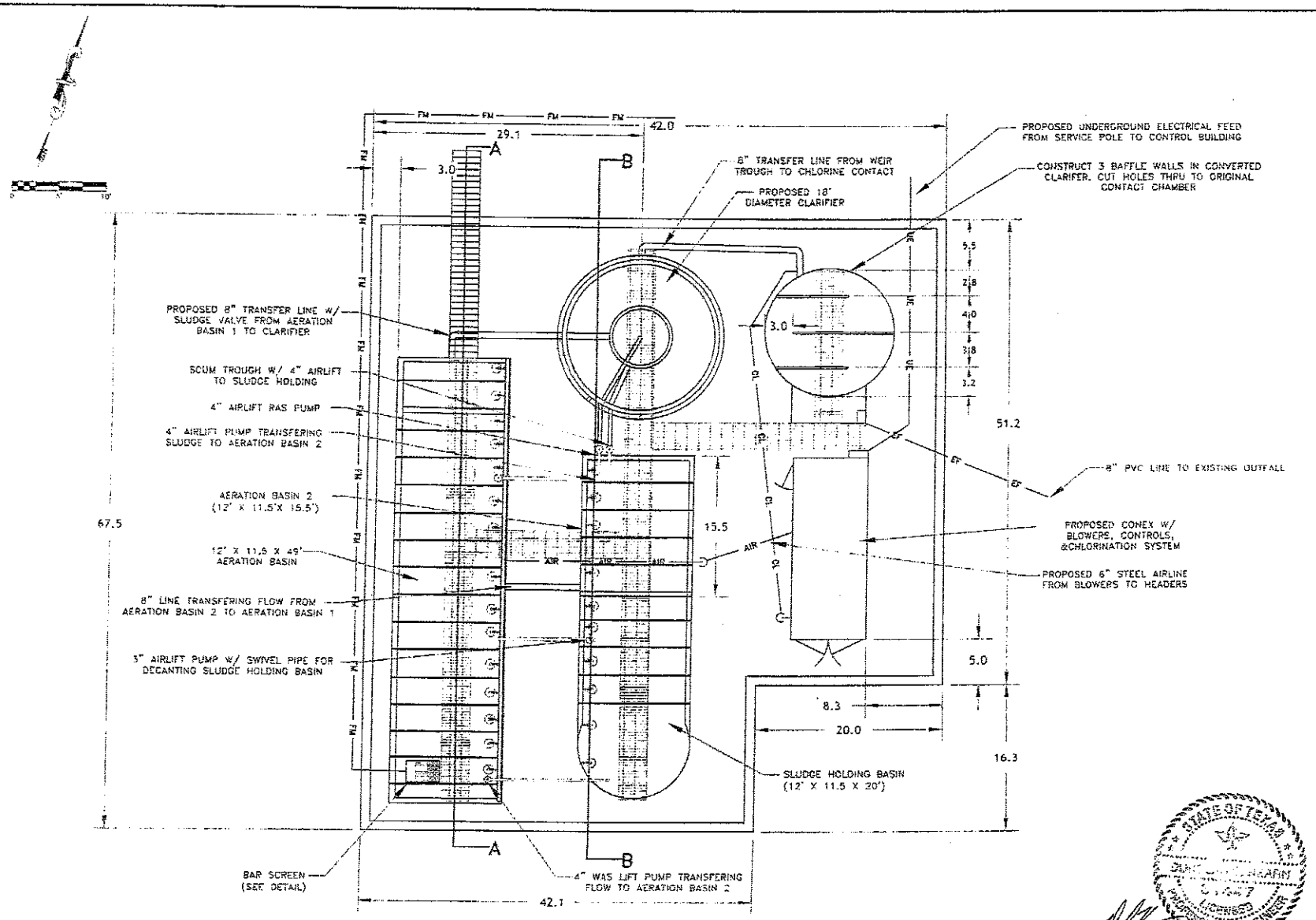
STATE OF TEXAS
REGISTERED
PROFESSIONAL ENGINEER
9/16/22

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 316-0176
FIRM REGISTRATION NO. F-1234

UNDINE, L.L.C.
BAINBRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT SITE PLAN
CHAMBERS COUNTY, TEXAS

DESIGNED BY: BDH
DRAWN BY: ASM
CHECKED BY: BJH
DATE: 9/2022

SHEET
4



HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

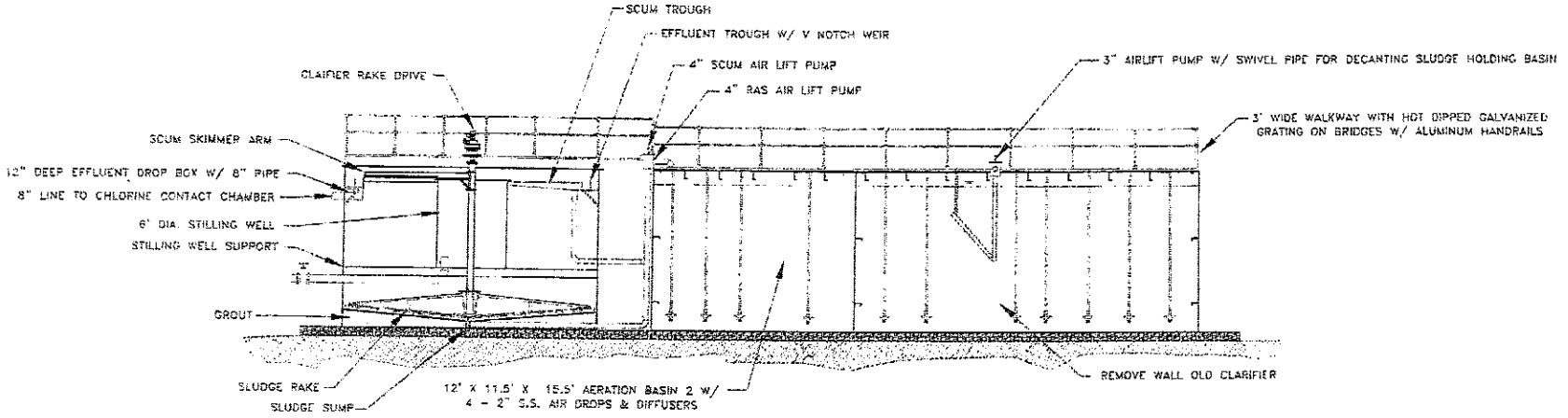
UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
PLANT LAYOUT
CHAMBERS COUNTY, TEXAS

DESIGNED BY: BDH
DRAWN BY: ACH
CHECKED BY: BDH
SCALE: 1" = 10'
DATE: 9/2022

NO. | REVISIONS | DATE

STATE OF TEXAS
BRIAN D. HEARN
103647
LICENSED
PROFESSIONAL ENGINEER
9/16/22

SHEET
5



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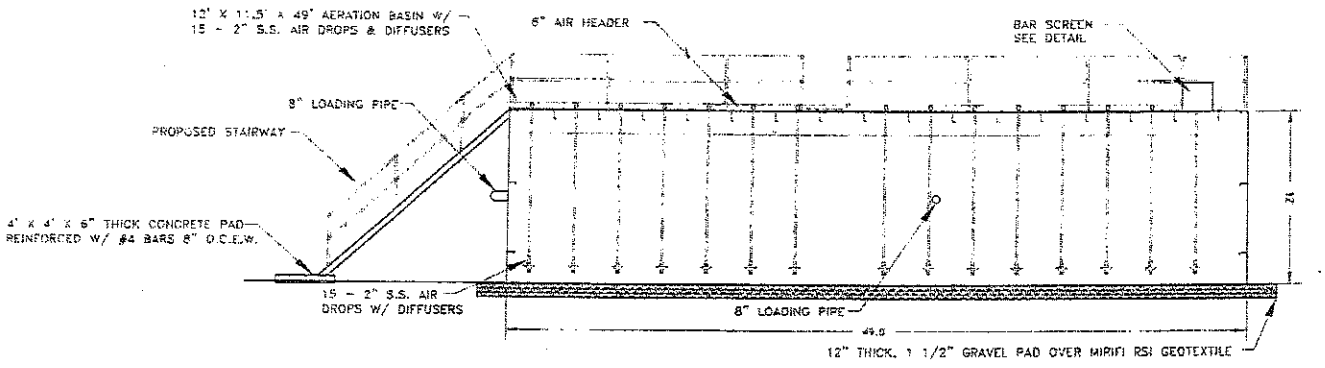


SECTION B – B

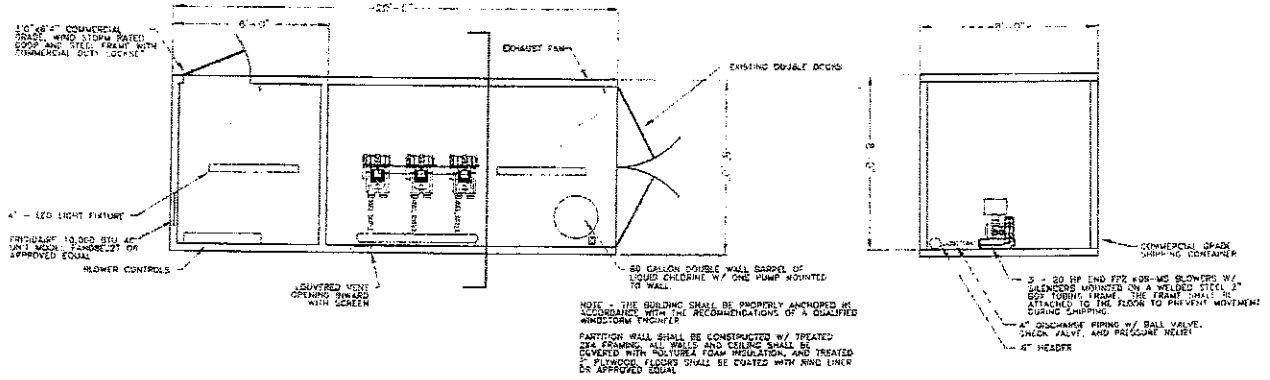
STATE OF TEXAS
SCOTT [illegible]
67647
LICENSED
PROFESSIONAL ENGINEER

9/16/12

HEARN ENGINEERING INC.
P.O. BOX 1104
CAMERON, TEXAS 76520
PH (512) 310-0176
FIRM REGISTRATION NO. F-1234

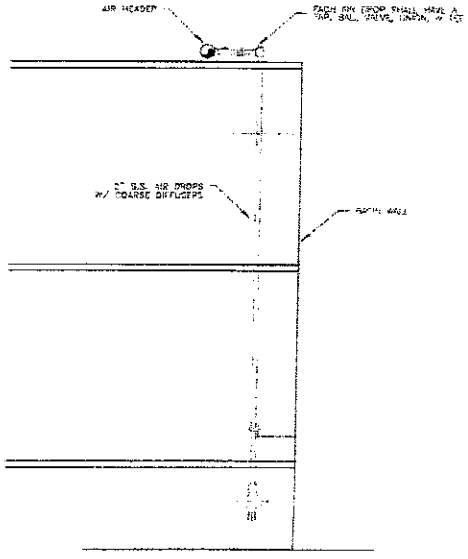
UNDINE, L.L.C.
BOLIVAR WASTEWATER SYSTEM
CRYSTAL PALACE WASTEWATER PLANT
SECTIONS
GALVESTON COUNTY, TEXAS

SHEET
6



20' SHIPPING CONTAINER PLAN VIEW

SECTION VIEW



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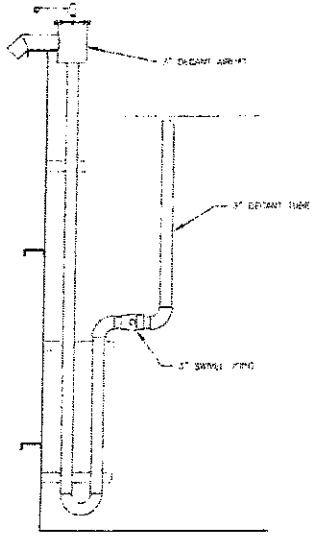

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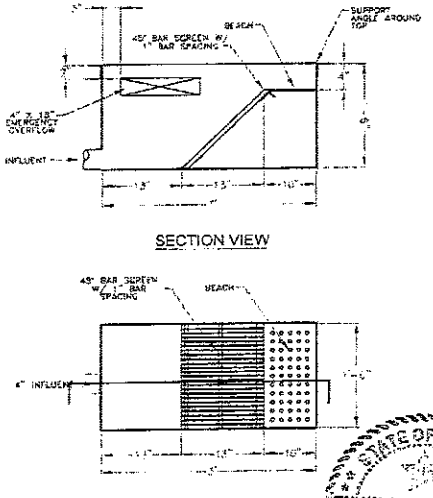

SECTION VIEW

PLAN VIEW

BAR SCREEN
NOT TO SCALE

STATE OF TEXAS
REGISTERED
PROFESSIONAL ENGINEER

NO.	REVISIONS	DATE
DESIGNED BY	DCH	
DRAWN BY	AFW	
CHECKED BY	DCH	
SCALE	AS NOTED	
DATE	9/2022	

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
P.O. BOX 1164
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PH (512) 390-0176
FIRM REGISTRATION NO. F-234

SHEET 7

ELECTRICAL NOTES:

1. UNDERGROUND CONDUIT MAY BE PVC RIGID CONDUIT WITH 24" MIN. COVER WITH 2" RED CONC. CAP IN LIEU OF RIGID STEEL.

2. EXTERIOR ELECTRICAL ENCL. SHALL BE NEMA-3R OR NEMA 4 WEATHERPROOF.

3. WIRING AND CONDUIT SHOWN FOR GENERAL ARRANGEMENT ONLY. CONTRACTOR SHALL INSTALL ALL CONTROL PANELS, WIRING, AND CONDUIT REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING INSTALLATION IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND THE INTENT OF THE SPECS.

4. ALL CONDUCTORS SHALL BE COPPER. CONDUIT INSIDE PUMP BUILDINGS MAY BE SURFACE MOUNTED EMT. ALL ELECTRICAL WITHIN CHEMICAL ROOMS SHALL BE PVC SEALED TO PREVENT CORROSION FROM GAS. SEAL W/FS SHALL BE INSTALLED ON ALL CONDUIT RUNS LEAVING A CHEMICAL ROOM.

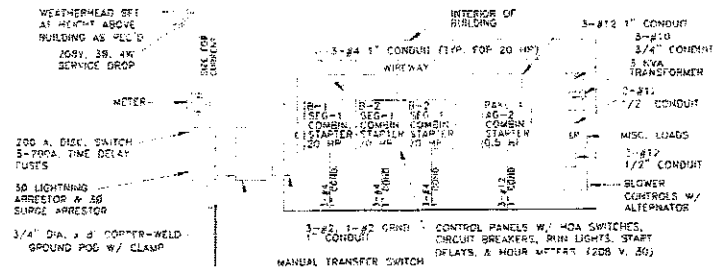
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING ALL ARRANGEMENTS AND COORDINATE THE INSTALLATION OF THE ELECTRICAL AND TELEPHONE SERVICE TO SITE. COST OF ESTABLISHING SERVICE SHALL BE INCLUDED IN THE BID. THE TELEPHONE NUMBER SHALL BE PLACED INSIDE THE ALARM DIALER.

6. ALL CONTROL PANELS SHALL BE LABELED WITH PERMANENT, PLASTIC NAME PLATES.

7. ALL MOTORS SHALL BE PROVIDED WITH ADJUSTABLE TIME DELAYS AND PHASE MONITORS.

8. ALL WIRING, ELECTRICAL EQUIPMENT, CONTROLS, AND MOTORS SHALL BE PROTECTED FROM SURGES WITH EQUIPMENT DESIGNED FOR THIS APPLICATION.

9. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS THAT THE CONTRACTOR SHALL PROVIDE AN INSTALLATION THAT IS COMPLETE AND FUNCTIONAL. ALL ITEMS NECESSARY, REASONABLY INCIDENTAL, OR CUSTOMARILY INCLUDED, SHALL BE PROVIDED.



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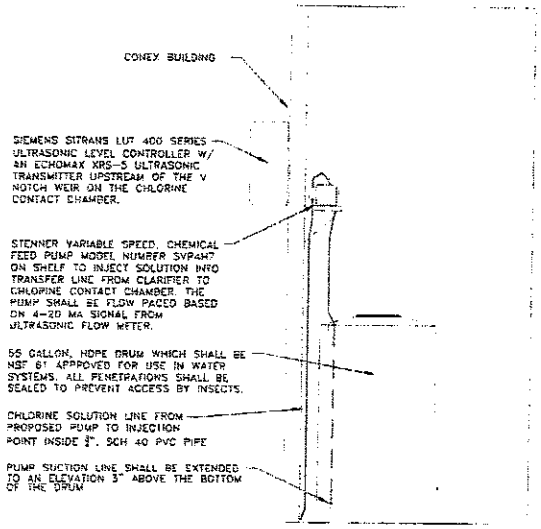

LIQUID CHEMICAL FEED
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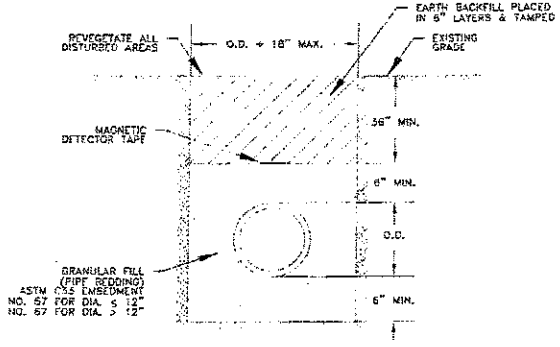

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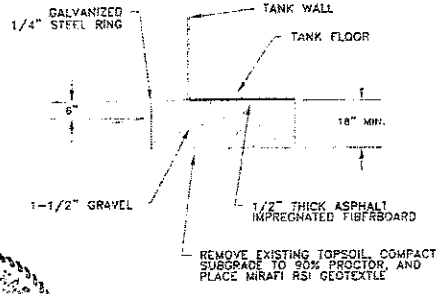

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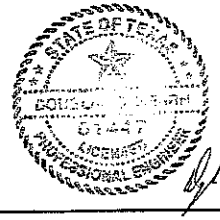

9/16/22

DESIGNED BY: DCH
DRAWN BY: ACL
CHECKED BY: DCH
SCALE: N/S
DATE: 9/2022

UNDINE, L.L.C.
BAYRIDGE WASTEWATER SYSTEM
WASTEWATER PLANT IMPROVEMENTS
MISCELLANEOUS DETAILS
CHAMBERS COUNTY, TEXAS

HEARN ENGINEERING INC.
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FIRM REGISTRATION NO. F-1234

SHEET 8