



**Southwest  
Engineers**

Civil | Environmental | Land Development

**WATER POLLUTION ABATEMENT PLAN  
(WPAP)**

FOR

**CARPENTER RANCH RV PARK**

584 MCKINNON LOOP  
BUDA, HAYS COUNTY, TEXAS 78610

Prepared For:

**CARPENTER ROAD RANCH LLC  
10417 TULAROSA PASS  
AUSTIN, TX 78726**

Prepared By:

**SOUTHWEST ENGINEERS, INC**

205 CIMARRON PARK LOOP, SUITE B  
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August 2023

Project #: 0946-001-20

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205 Cimarron Park Loop, Ste B  
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Phone: 512.312.4336

Attachment C – BMPs for On-site Stormwater  
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I.

EDWARDS AQUIFER APPLICATION COVER PAGE  
(TCEQ-20705)

# Texas Commission on Environmental Quality

## Edwards Aquifer Application Cover Page

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### Our Review of Your Application

**The Edwards Aquifer Program staff conducts an administrative and technical review of all applications. The turnaround time for administrative review can be up to 30 days as outlined in 30 TAC 213.4(e). Generally administrative completeness is determined during the intake meeting or within a few days of receipt. The turnaround time for technical review of an administratively complete Edwards Aquifer application is 90 days as outlined in 30 TAC 213.4(e). Please know that the review and approval time is directly impacted by the quality and completeness of the initial application that is received. In order to conduct a timely review, it is imperative that the information provided in an Edwards Aquifer application include final plans, be accurate, complete, and in compliance with [30 TAC 213](#).**

### Administrative Review

1. [Edwards Aquifer applications](#) must be deemed administratively complete before a technical review can begin. To be considered administratively complete, the application must contain completed forms and attachments, provide the requested information, and meet all the site plan requirements. The submitted application and plan sheets should be final plans. Please submit one full-size set of plan sheets with the original application, and half-size sets with the additional copies.

To ensure that all applicable documents are included in the application, the program has developed tools to guide you and web pages to provide all forms, checklists, and guidance. Please visit the below website for assistance: <http://www.tceq.texas.gov/field/eapp>.

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

An appointment should be made to resubmit the application. The application is re-examined to ensure all deficiencies are resolved. The application will only be deemed administratively complete when all administrative deficiencies are addressed.

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

### Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

**Mid-Review Modifications**

It is important to have final site plans prior to beginning the permitting process with TCEQ to avoid delays.

Occasionally, circumstances arise where you may have significant design and/or site plan changes after your Edwards Aquifer application has been deemed administratively complete by TCEQ. This is considered a “Mid-Review Modification”. Mid-Review Modifications may require redistribution of an application that includes the proposed modifications for public comment.

If you are proposing a Mid-Review Modification, two options are available:

- If the technical review has begun your application can be denied/withdrawn, your fees will be forfeited, and the plan will have to be resubmitted.
- TCEQ can continue the technical review of the application as it was submitted, and a modification application can be submitted at a later time.

If the application is denied/withdrawn, the resubmitted application will be subject to the administrative and technical review processes and will be treated as a new application. The application will be redistributed to the affected jurisdictions.

Please contact the regional office if you have questions. If your project is located in Williamson, Travis, or Hays County, contact TCEQ’s Austin Regional Office at 512-339-2929. If your project is in Comal, Bexar, Medina, Uvalde, or Kinney County, contact TCEQ’s San Antonio Regional Office at 210-490-3096

Please fill out all required fields below and submit with your application.

<b>1. Regulated Entity Name:</b> Carpenter Ranch RV Park					<b>2. Regulated Entity No.:</b>				
<b>3. Customer Name:</b> Carpenter Road Ranch LLC					<b>4. Customer No.:</b>				
<b>5. Project Type:</b> (Please circle/check one)	<input checked="" type="radio"/> New	Modification			Extension		Exception		
<b>6. Plan Type:</b> (Please circle/check one)	<input checked="" type="radio"/> WPAP	<input type="radio"/> CZP	<input type="radio"/> SCS	<input type="radio"/> UST	<input type="radio"/> AST	<input type="radio"/> EXP	<input type="radio"/> EXT	Technical Clarification	Optional Enhanced Measures
<b>7. Land Use:</b> (Please circle/check one)	Residential		<input checked="" type="radio"/> Non-residential			<b>8. Site (acres):</b>		57.4	
<b>9. Application Fee:</b>	\$8,000		<b>10. Permanent BMP(s):</b>			Wet Pond (Water Quality W/ Detention)			
<b>11. SCS (Linear Ft.):</b>	N/A		<b>12. AST/UST (No. Tanks):</b>			N/A			
<b>13. County:</b>	Hays		<b>14. Watershed:</b>			Little Bear Creek - Colorado River			

# Application Distribution

Instructions: Use the table below to determine the number of applications required. One original and one copy of the application, plus additional copies (as needed) for each affected incorporated city, county, and groundwater conservation district are required. Linear projects or large projects, which cross into multiple jurisdictions, can require additional copies. Refer to the “Texas Groundwater Conservation Districts within the EAPP Boundaries” map found at:

[http://www.tceq.texas.gov/assets/public/compliance/field\\_ops/eapp/EAPP%20GWCD%20map.pdf](http://www.tceq.texas.gov/assets/public/compliance/field_ops/eapp/EAPP%20GWCD%20map.pdf)

For more detailed boundaries, please contact the conservation district directly.

<b>Austin Region</b>			
<b>County:</b>	<b>Hays</b>	<b>Travis</b>	<b>Williamson</b>
Original (1 req.)	✓	—	—
Region (1 req.)	✓	—	—
County(ies)	✓	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input checked="" type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

<b>San Antonio Region</b>					
<b>County:</b>	<b>Bexar</b>	<b>Comal</b>	<b>Kinney</b>	<b>Medina</b>	<b>Uvalde</b>
Original (1 req.)	—	—	—	—	—
Region (1 req.)	—	—	—	—	—
County(ies)	—	—	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA Medina	<input type="checkbox"/> EAA Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Henry Juarez

Print Name of Customer/Authorized Agent

Signature of Customer/Authorized Agent

Date 9/1/2022

**\*\*FOR TCEQ INTERNAL USE ONLY\*\***

Date(s) Reviewed:		Date Administratively Complete:	
Received From:		Correct Number of Copies:	
Received By:		Distribution Date:	
EAPP File Number:		Complex:	
Admin. Review(s) (No.):		No. AR Rounds:	
Delinquent Fees (Y/N):		Review Time Spent:	
Lat./Long. Verified:		SOS Customer Verification:	
Agent Authorization Complete/Notarized (Y/N):		Fee Check:	Payable to TCEQ (Y/N):
Core Data Form Complete (Y/N):			Signed (Y/N):
Core Data Form Incomplete Nos.:			Less than 90 days old (Y/N):



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## II.

### General Information Form (TCEQ-0587)

# General Information Form

## Texas Commission on Environmental Quality

For Regulated Activities on the Edwards Aquifer Recharge and Transition Zones and Relating to 30 TAC §213.4(b) & §213.5(b)(2)(A), (B) Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

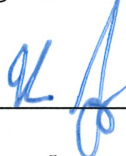
## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **General Information Form** is hereby submitted for TCEQ review. The application was prepared by:

Print Name of Customer/Agent: Henry Juarez

Date: 9/1/2022

Signature of Customer/Agent:



## Project Information

1. Regulated Entity Name: Carpenter Ranch RV Park
2. County: Hays County
3. Stream Basin: Colorado River Basin
4. Groundwater Conservation District (If applicable): Barton Springs Edwards Aquifer Conservation District
5. Edwards Aquifer Zone:
  - Recharge Zone
  - Transition Zone
6. Plan Type:
  - WPAP
  - SCS
  - Modification
  - AST



UST

Exception Request

7. Customer (Applicant):

Contact Person: James Stinson

Entity: Carpenter Road Ranch LLC

Mailing Address: 10417 Tularosa Pass

City, State: Austin, TX

Zip: 78726

Telephone: 512-221-0780

FAX: \_\_\_\_\_

Email Address: centexhuntclub@gmail.com

8. Agent/Representative (If any):

Contact Person: Henry Juarez

Entity: Southwest Engineers, Inc.

Mailing Address: 205 Cimarron Park Loop

City, State: Buda, TX

Zip: 78610

Telephone: 512-312-4336

FAX: \_\_\_\_\_

Email Address: henry.juarez@swengineers.com

9. Project Location:

The project site is located inside the city limits of \_\_\_\_\_.

The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of Hays.

The project site is not located within any city's limits or ETJ.

10.  The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

584 McKinnon Loop Buda, TX 78610

11.  Attachment A – Road Map. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12.  Attachment B - USGS / Edwards Recharge Zone Map. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

Project site boundaries.

USGS Quadrangle Name(s).

Boundaries of the Recharge Zone (and Transition Zone, if applicable).

Drainage path from the project site to the boundary of the Recharge Zone.

13.  The TCEQ must be able to inspect the project site or the application will be returned. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

Survey staking will be completed by this date: \_\_\_\_\_

14.  **Attachment C – Project Description.** Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

- Area of the site
- Offsite areas
- Impervious cover
- Permanent BMP(s)
- Proposed site use
- Site history
- Previous development
- Area(s) to be demolished

15. Existing project site conditions are noted below:

- Existing commercial site
- Existing industrial site
- Existing residential site
- Existing paved and/or unpaved roads
- Undeveloped (Cleared)
- Undeveloped (Undisturbed/Uncleared)
- Other: \_\_\_\_\_

### ***Prohibited Activities***

16.  I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
- (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
- (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
- (4) The use of sewage holding tanks as parts of organized collection systems; and
- (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17.  I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);

- (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and
- (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

### ***Administrative Information***

18. The fee for the plan(s) is based on:

- For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
- A request for an exception to any substantive portion of the regulations related to the protection of water quality.
- A request for an extension to a previously approved plan.

19.  Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

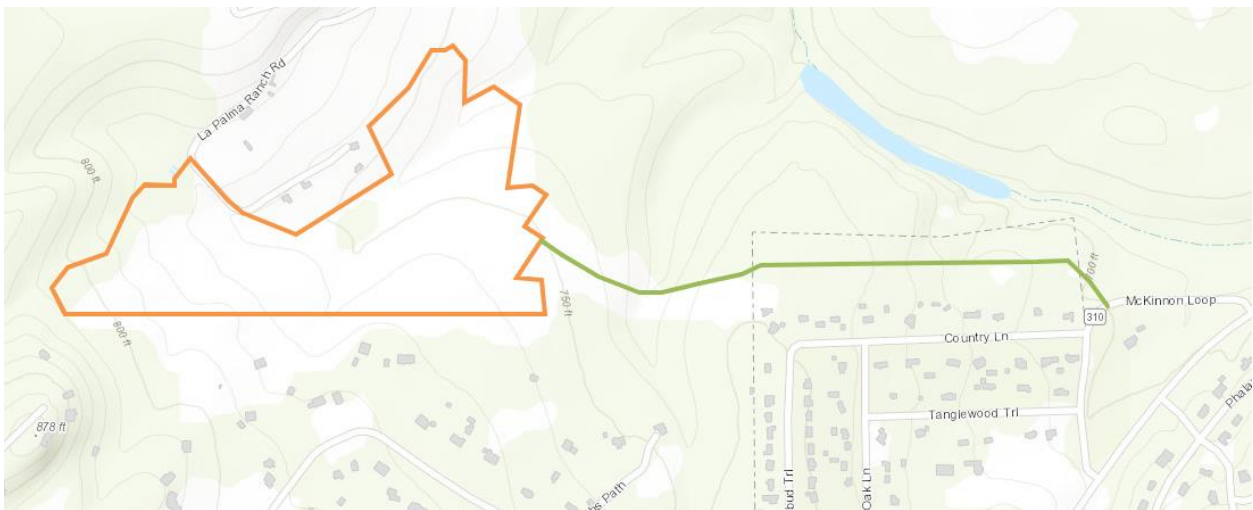
- TCEQ cashier
- Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

21.  No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

WATER POLLUTION ABATEMENT PLAN  
ATTACHMENT A

ROAD/LOCATION MAP

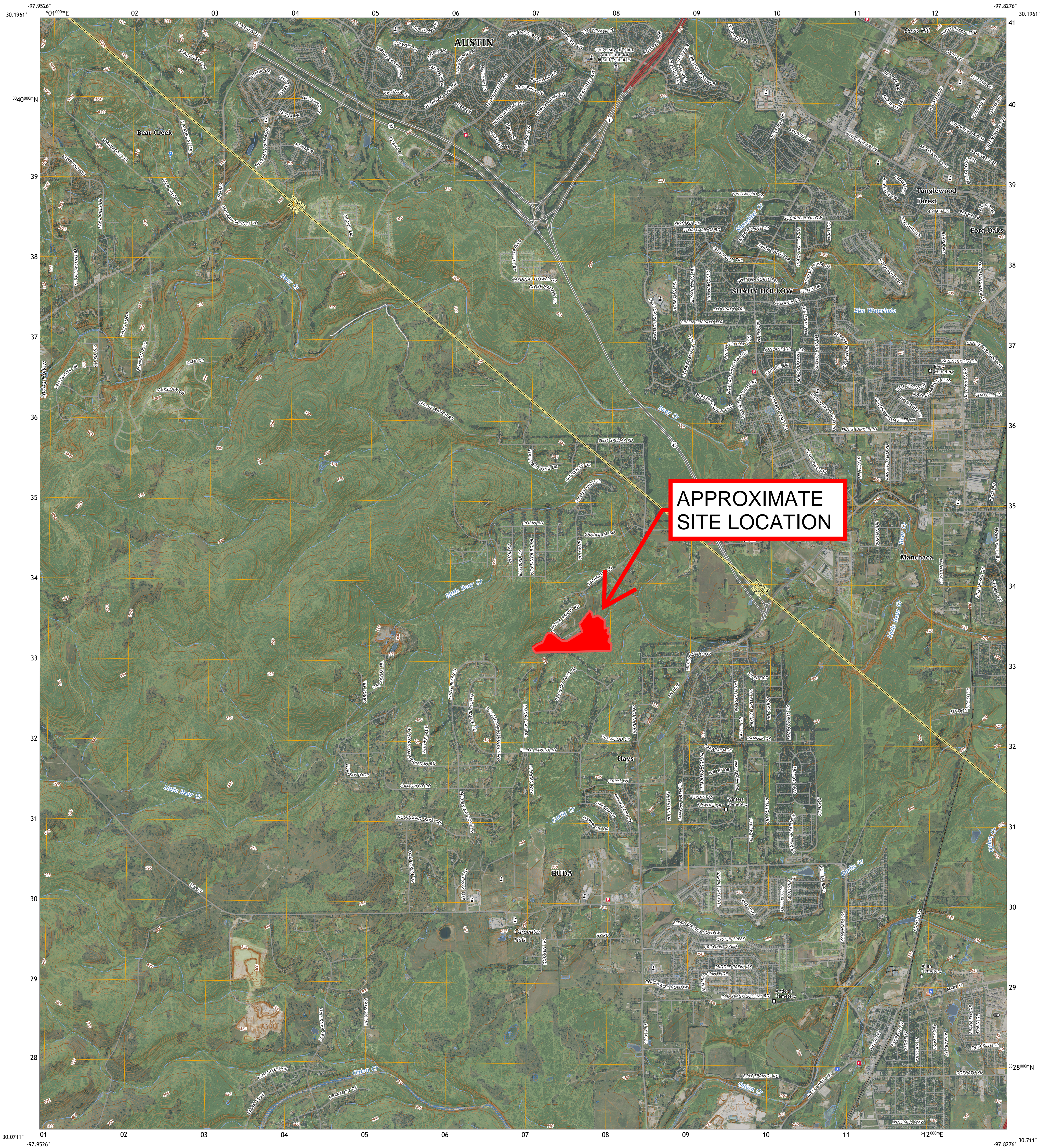


584 MCKINNON LOOP  
BUDA, TX 78610

CONTRIBUTING ZONE PLAN  
ATTACHMENT B

USGS/EDWARDS AQUIFER RECHARGE ZONE MAPS



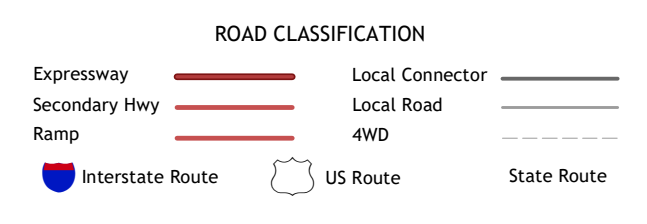
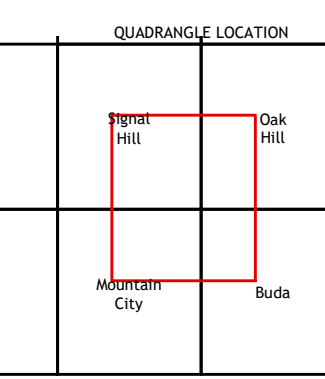
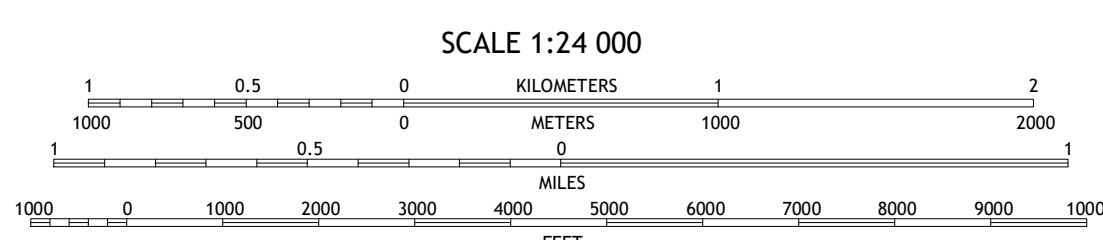
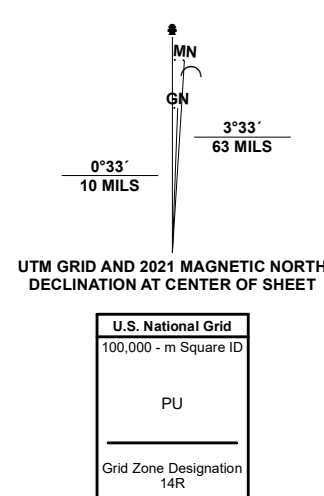


**APPROXIMATE  
SITE LOCATION**

Produced by the United States Geological Survey  
North American Datum of 1983 (NAD83)  
World Geodetic System of 1984 (WGS84) Projection and  
1 000-meter grid/Universal Transverse Mercator, Zone 14R  
Data is provided by The National Map (TNN), is the best available at the time of map  
generation, and includes data content from supporting themes of Elevation,  
Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover,  
and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC)  
Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale.  
Private lands within government reservations may not be shown. Obtain permission  
before entering private lands. Temporal changes may have occurred since these data  
were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: <https://nationalmap.gov>



7.5-MINUTE TOPO 1, TX  
2022



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GENERAL INFORMATION SECTION  
ATTACHMENT C

PROJECT DESCRIPTION

The subject property consists of a 54.7-acre tract located at 584 McKinnon Loop, Buda, TX 78610. The property is located within the City of Hays Extraterritorial Jurisdiction (ETJ) and City of Austin's 2-mile ETJ as well as within Hays County and the Edwards Aquifer Recharge as defined by the Texas Commission on Environmental Quality (TCEQ). The project tract is located within the Onion Creek-Colorado River Watershed. Currently, the property consists of undeveloped land with natural vegetation and trees. There are several drainage swales or creeks that drain across the property. The storm water runoff drains primarily by overland sheet flow in an easterly direction. The proposed development includes the constructions of 105 unit recreational vehicle park with associated access roads and driveways and a 3.63 acre wet pond. The wet pond will be used as a Permanent Best Management Practices (BMP) onsite to treat storm water generated from the maximum allowable impervious cover of 15%. The BMP has been designed in accordance with TCEQ's complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices RG-348 Addendum Sheet. Stormwater will be detained in the wet pond prior being released into a tributary of Onion Creek.

The WPAP describes the measures taken to design the wet pond. The design calculations are based on a maximum allowable impervious cover of approximately 5.09 acres draining to the wet pond at an ultimate built-out of 15% impervious cover. The impervious cover will be a combination of paved roadways and parking areas for recreational vehicles along with amenity buildings. Please refer to the site construction drawings provided with this WPAP for more information.



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III.

Geologic Assessment Form  
(TCEQ-0585)



# Geologic Assessment

## Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

**To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.**

**Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.**

## Signature

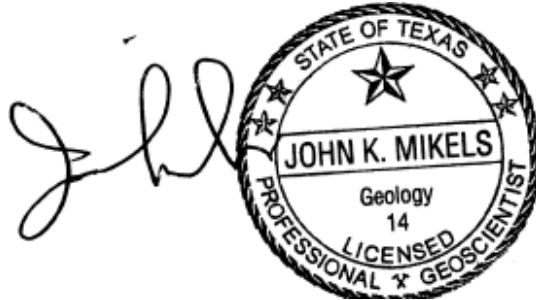
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30TAC213.

Print Name of Geologist: John K. Mikels, PG Telephone: 512-445-3433

Date: 7/9/22 Email: geos-jkm@swbell.net Fax: 512-445-5005

Representing: Sole Proprietorship, d/b/a GEOS Consulting (No TBPG Firm Registration #)  
(Name of Company and TBPG or TBPE registration number)

Signature & Seal of Geologist:



Regulated Entity Name:

## Project Information

1. Date(s) Geologic Assessment was performed: 4/27/22

2. Type of Project:

WPAP  
 SCS

AST  
 UST

3. Location of Project:

Recharge Zone (*per TCEQ online Edwards Aquifer map*)  
 Transition Zone  
 Contributing Zone within the Transition Zone

**Regulated Entity:** Carpenter Ranch Resort, Hays City, TX

- 4.  **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
- 5.  **Soil cover** on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups\* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

<u>Soil Name</u>	<u>Group</u>	<u>Thickness (ft)</u>
RUD: Rumble-Comfort, rubbly association, 1-8% slopes.....	C/D.....	0.8-3.3
CrD: Comfort-Rock outcrop complex, 1-8% slopes.....	D.....	0.8-1.7

*\*Soil Group Definitions (abbreviated)*  
*A - Soils having a high infiltration rate when thoroughly wetted.*  
*B - Soils having a moderate infiltration rate when thoroughly wetted.*  
*C - Soils having a slow infiltration rate when thoroughly wetted.*  
*D - Soils having a very slow infiltration rate when thoroughly wetted.*

- 6.  **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column (**combined with Attachment C**).
- 7.  **Attachment C – Site Geology.** A narrative description of the site-specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
- 8.  **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" = 400'

Applicant's Site Plan Scale: 1" = 168'  
Site Geologic Map Scale: 1" = 168' (for printing on 24" x 18" paper)  
Site Soils Map Scale (if more than 1 soil type): N/A

- 9. Method of collecting positional data:
  - Global Positioning System (GPS) technology.
  - Other method(s). Please describe method of data collection: Aerial imagery & site maps
- 10.  The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
- 11.  Surface geologic units are shown and labeled on the Site Geologic Map.
- 12.  Geologic or **manmade** features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

**Regulated Entity:** Carpenter Ranch Resort, Hays City, TX

- Geologic or manmade features were not discovered on the project site during the field investigation.
13.  The Recharge Zone boundary is shown & labeled, if appropriate. ***(nearest RZ-TZ boundary is about 230 feet SE of Site and indicated on the GA Map)***
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.
- There is/are 0 well(s) present on the project site and the location(s) is/are shown and labeled. (Check all of the following that apply.)
- The wells are not in use and have been properly abandoned.
- The wells are not in use and will be properly abandoned.
- The wells are, or will be, in use and comply with 16 TAC Chapter 76.
- There are no wells or test holes of any kind known to exist on the project site. ***(NOTE: No wells were seen on the Site and no records of wells on this Site were found in the TWDB/WDI online well database. The Texas RRC online well viewer did not indicate the presence of any oil/gas/exploratory wells on/near the Site.)***

***Administrative Information***

15.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, & county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.

**Site Name & Address:** Carpenter Ranch Resort (access road), Hays City, Hays County, TX

**Attachment A - Geologic Assessment Table:** (attached hereto)

**Attachment B - Stratigraphic Column:** *(\*indicates formations cropping out on/near this Site)*

<b><u>Group/Formation</u></b>	<b><u>Member(s)</u></b>	<b><u>Est. Thickness Beneath Site (ft)</u></b>
Kdr, Del Rio Fm	NA	10-20±
Kgt, Georgetown Fm	NA	30-40±
Ked, Edwards*	Regional Dense, Leached & Collapsed	70±

**Attachment C - Site Geology**

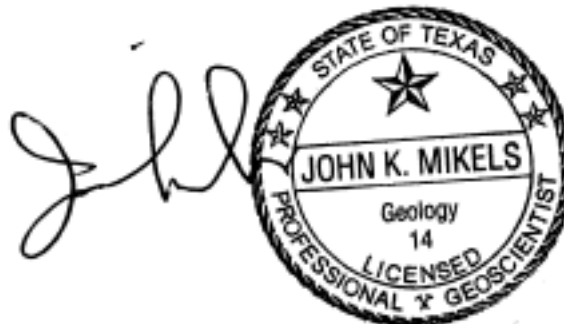
The surficial geology and soils of the Site are indicated on the attached Geologic Assessment Map. The geology and soils indicated are based on:

- Regional geologic mapping by the BEG and the BSEACD
- Site inspection by GEOS Consulting on 4/27/22
- Soils data from the USDA/NRCS Web Soil Survey site

The only strata seen on the Site were the Georgetown Fm., and the Edwards limestone (Leached & Collapsed and Regional Dense Members of the Edwards per regional geo mapping?). Due to the overall low topo relief on the Site, vertical bedrock outcrops, where strata bedding/thickness, joints, faults and other geologic features can be clearly observed, were not seen on the Site. In addition, the proposed road access easement area is largely coincidental with an existing, unpaved “ranch” road, along which there has been much grading, to make the road drivable. Numerous piles of rock rubble along the sides the road attest to the grading of the existing road. Much of the undisturbed land along the road sides is covered with dense vegetation, obscuring clear observation of the underlying strata. There are some minor bedrock outcrops along the ephemeral creek (tributary to Little Bear Creek) that transects the Site (indicated on the Geologic Map). The faults and contacts shown on the Geologic Map are from regional mapping, not site-specific observations. The Site is in the Balcones Fault Zone. Strata beneath the Site probably dip south-easterly at 2 to 5 degrees, the regional trend.

TCEQ’s online Edwards Aquifer Viewer map indicates that the Site is inside the Recharge Zone. No reportable features were found on the Site. Recharge to the Edwards Aquifer directly from the Site is probably low due to: (1) the lack of significant karst/recharge features on the site, (2) the clayey soils (Hydrologic Groups C & D) across much of the Site, and (3) the lack of ponds on and/or continuous flowing creeks crossing the Site.

**Attachment D - Geologic Map** (included w/ this report)



**GEOLOGIC ASSESSMENT TABLE**

<b>Project Name:</b> Carpenter Ranch Resort						<b>Location:</b> Carpenter Lane & McKinnon Loop, Hays City (ETJ), Hays County, TX														
LOCATION			FEATURE CHARACTERISTICS										EVALUATION		PHYSICAL SETTING					
1A	1B	1C	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11		12	
FEATURE ID. NO.	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	GEOLOG. FORM.	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILLING	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)	TOPOGRAPHY	
						X	Y	Z		0/10	SF,Z,O	SF,Z,O		per flowchart	2B+5A+8B	<40	≥40	<1.6	≥1.6	
No significant features (geologic, karst, recharge) found on this site																				

**NOTES:**

**Lat/Long Datum:** NAD1983 & Google Earth Pro

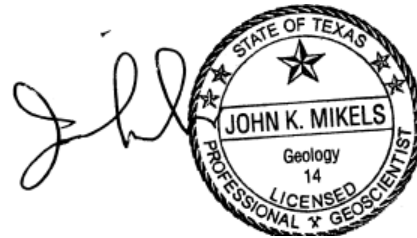
2A: FEATURE TYPE		2B: POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features, vuggy rock, etc.	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

8A: INFILLING	
N	None, exposed bedrock
C	Coarse - cobbles, breakdown, sand, gravel
O	Loose or soft mud or soil, organics, leaves, sticks, dark colors
F	Fines, compacted clay-rich sediment, soil profile, gray or red colors
V	Vegetation. Give details in narrative description
FS	Flowstone, cements, cave deposits
X	Other materials

12: TOPOGRAPHY	
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed	

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

John K. Mikels, PG  
Geologist's Printed Name



Signature & Seal

7/5/22  
Date





**Fig. 1 - Geologic Assessment Map: Carpenter Ranch Resort**

Features of Potential Concern Indicated With An "✖" and Feature No. (F-#)

<b>GA Site Boundary:</b>	<b>Geologic Units</b>	<b>Soil Units</b>
<b>Soil Unit Boundary:</b>	Kdr: Del Rio Formation	CrD: Comfort-Rock outcrop complex, 1-8% slopes
<b>Geologic Unit Contact:</b>	Kgt: Georgetown Formation	RUD: Rumple-Comfort, rubbly association, 1-8% slopes
<b>Geologic Faults:</b>	Ked: Edwards Formation	

Estimated fault throws cited by U/D notation. Some faults and unit contacts coincide.  
 Faulted contact between Ked & Kdr, in SW corner of figure, is also the Recharge Zone - Transition Zone boundary.

Professional seal for John K. Mikels, Geology, Licensed Professional Geoscientist, State of Texas. Includes a scale bar in feet (0 to 500) and a north arrow.

Aerial map base adapted from Google Earth (Image Date: 1/13/2018)

Geologic date from BSEACD (online files), mapping by Nico Hauwert, PG, PhD (COA), and field observations by GEOS Consulting. Soils data from the USDA online Web Soil Survey ([www.websoilsurvey.nrcs.usda.gov/app/](http://www.websoilsurvey.nrcs.usda.gov/app/)). GA area boundary from Site Survey Map (5/20/22) by Albert Uecker, TxRPLS#5888





October 1, 2022

**Jacquelyn Bruegging**  
7811 Menchaca Road  
Austin, Texas 78745  
Attn.: Ms. Jacquelyn Bruegging

Re: Geotechnical Investigation  
Pond Construction and Liner Recommendations  
**Stinson-Hays RV Park Lake**  
Manchaca, Texas  
Engineer's Job No.: 22103100.013

Dear Ms. Bruegging:

As requested, we have developed recommendations for the design and construction of the wet pond at this site. The design and construction information is contained in two documents that are included as attachments to this letter:

1. Recommendations – Wet Pond - This document contains general guidelines and discussion of wet pond design and construction including information on clay liners. It is intended for use by the civil engineer to use in developing the pond details.
2. Quality Assurance/Quality Control Recommendations for Clay Liners for Wet Ponds – This document contains recommendations regarding QA/QC for the wet pond. These recommendations follow the City of Austin's draft document for Liner Construction and Testing dated April 18, 2007, and meet the requirements of the COA Environmental Criteria Manual.

We hope that the information provided herein is sufficient for your use. If you have any questions or comments or need any additional information, please contact our office.

Sincerely,

**MLA Geotechnical** TBPE FIRM # F-2684

Geotechnical Engineering and Construction Materials Testing  
*"put us to the test"*

Timothy R. Weston, P.E.  
President

10/3/22



Additional Attachments: MLA Geotechnical Appendix A & Appendix B

### **RECOMMENDATIONS – WET POND**

It is our understanding that wet ponds are planned for this site. These recommendations have been developed based upon our experience with wet ponds on sites such as this one. All site preparation and earthwork should be consistent with the City of Austin Standard Specification Items in Series 100 and 200, as applicable and as per the City of Austin Environmental Criteria Manual Section 1 unless elsewhere specified in this report.

1. Excavation for the wet pond may be performed using ordinary power equipment to the surface of limestone as shown on the Logs of Boring. Excavation within the limestone will require heavy-duty rock excavating equipment.
2. Embankments using on-site material constructed with side slopes of 3:1 (horizontal to vertical) are expected to stand freely. In addition, the maximum cut side slope should also be 3:1 (horizontal to vertical) in the pond area.
3. A pond “liner” will be required for the pond. Compacted clay liners have been used in similar subsurface conditions with acceptable results. A compacted clay liner placed on the bottom and side slopes of the entire pond should be a minimum of 12 inches thick. Greater thickness may be required depending upon the planned pond use. The clay liner material, compaction and construction should meet the enclosed *Quality Assurance/Quality Control Recommendations for Clay Liners for Wet Ponds*.
4. In the design of wet ponds, a single small leak can often cause drainage of the entire wet pond. Consequently, care must be taken to preserve the integrity of the pond liner at all possible points that water may find a path to exit the pond. Possible point leakage can be caused by the following:
  - Drain pipes between pools and where drain pipes or other elements penetrate the pond liner are potential leakage areas. Gravel bedding for inlet and outlet drain pipes or crossover pipes is often the source of leakage. Care should be taken to make a good, tight contact between pipe trenches and the pond liner. Please note that compaction of



the clay liner beneath inlet and outlet structures is recommended. This means that the compacted liner should be completed in the vicinity of inlet and outlet structures prior to construction of the inlet and outlet structures.

- Leaking storm sewer pipe, drain pipe and/or crossover pipe joints that could potentially hold water because they are below the permanent pool elevation of the pond should be sealed to make the joints water tight.
  - Erosion of the pond liner can occur due to the velocity of water entering the pond or traveling within the pond. Velocity should be suitably reduced to avoid eroding the pond liner.
  - The liner will typically crack in areas not submerged in water because the liner will be exposed to the heat. When the water level in the pond rises and reaches the formerly exposed liner, water can leak out. This is usually caused by evaporation of the water in a wet pond due to an extended period without significant rainfall. Consequently, all wet ponds should typically have a source of water other than storm runoff that can keep the pond at a constant level.
  - After completion of the compacted clay liner, the pond should be filled with water to the permanent pool elevation as soon as possible. Care should be taken to keep the pond liner wet until the pond can be filled by watering the liner regularly such that cracks do not form in the liner surface. If the pond liner is allowed to dry out before the pond is filled with water, it will likely crack, lose its integrity and leak once it is filled with water.
5. If a seepage condition occurs in the subsurface beneath the pond liner prior to filling the pond with water, the liner can possibly be compromised. This often occurs when the pond is rough cut and liner construction is about to begin. These seeps are often large enough to partially fill the pond with water prior to liner construction, making liner construction impossible. The key to getting the pond liner constructed is to intercept the ground water before it reaches the pond and take the water to another location so that the excavation for the pond will dry out. This is often

accomplished using intercepting trenches and/or wells. Pumping of the water to another location is usually required. Input from the earthwork contractor on the best method to intercept the water before it gets to the pond is key to solving these problems as they arise. Once the seepage of water into the pond excavation is stopped and the excavation dried out, the pond liner can be constructed. Upon completion of pond liner construction, the pond must be filled with water prior to abandoning the dewatering trenches or wells. If the dewatering solution is abandoned prior to filling the pond, water pressure can build up behind the pond liner and seep through the liner, destroying the liner's integrity. Consequently, the contractor should identify seep areas during and after excavation is complete to assist in developing a dewatering plan prior to placing the pond liner.

6. The liner should extend a minimum of two feet above the permanent pool elevation of the completed pond.
7. Pond liner design and construction should be done in accordance with the enclosed *Quality Assurance/Quality Control Recommendations for Clay Liners for Wet Ponds*.
8. For a pond to be constructed properly by an earthwork contractor, a set of plans including cross sections, details and testing specifications should be developed by the civil engineer. The geotechnical engineer should be retained to review the plans, specifications and details for the ponds and pond liners prior to construction. The geotechnical engineer should also be retained to monitor the construction of the pond liners.
9. The soil encountered in the pond boring is not expected to meet the material requirements of the enclosed *Quality Assurance/Quality Control Recommendations for Clay Liners for Wet Ponds*.

**Quality Assurance/Quality Control Recommendations for Clay Liners for Wet Ponds**

The following recommendations for quality control and quality assurance with respect to material testing and construction recommendations shall apply to clay liners for ponds that are to have permanent pools. Pond construction details are specifically not included in this document and should be provided by the civil engineer for the project based upon the recommendations contained herein. In addition, no hydrologic or environmental analysis of the pond has been performed in developing these recommendations.

**Section 1: Material Qualification**

1. Selection of clay liner material shall be guided by the following criteria.

Material Property	Requirement	Testing Standard
Minimum Liquid Limit	> 50	ASTM D 4318
Minimum Plasticity Index	> 30	ASTM D 4318
Minimum Percent Passing # 200 Sieve	> 60 %	ASTM D 422
Maximum Particle Size	< 1 inch	ASTM D 422
Maximum Laboratory Permeability	< $1 \times 10^{-7}$ cm/sec	ASTM D 5084

2. Clay liner material shall be free of organics and debris, such as tree limbs, bark, leaves, trash or other deleterious material.
3. The maximum clay clod size during liner placement and compaction shall be approximately one inch.
4. For each potential source of pond liner material, enough material shall be provided by the earthwork contractor to run the tests listed in the table under Item 1 of Section 1. During permeability testing, the samples should be compacted in the laboratory to the density and moisture levels indicated in Section 3B Item 2 of this document.
5. At the same time that the tests listed in Item 1 of Section 1 are run, the moisture density relationship (ASTM D 698) must be determined for use during field compaction testing of the clay liner.
6. If all requirements listed under Item 1 of Section 1 are met, then the material provided shall be considered accepted for use in the construction of the compacted clay liner. If all requirements are not met, then another material must be chosen and tested for compliance with the material recommendations in Section 1.
7. If the subgrade material consists of soil, then Atterberg Limits, gradation and a moisture density relationship should be determined for the subgrade soils in preparation for subgrade moisture and density testing during construction. These tests should be run in accordance with the standards listed in Section 6 of this document.

**Section 2: General**

1. A compacted clay liner placed on the bottom and side slopes of the entire pond should be a minimum of 12 inches thick. Greater thickness may be required depending upon the planned pond use, as determined by the civil engineer. The clay liner shall be placed in maximum 6-inch thick lifts after compaction.
2. The liner should extend a minimum of two feet above the permanent pool elevation of the completed pond.
3. The clay liner shall extend below and around all concrete ramps, inflow/outflow headwall structures, aprons, walls, and other miscellaneous structures within the pond interior.
4. The velocity of water entering the pond should be suitably reduced to avoid eroding the pond liner.
5. Embankments constructed of clay liner material may be constructed with maximum side slopes of 3:1 (horizontal to vertical). In addition, the maximum cut side slope may also be 3:1 (horizontal to vertical) in the pond area.
6. Storm sewer pipe, drain pipe and/or crossover pipe joints that could potentially hold water because they are below the permanent pool elevation of the pond should be sealed to make the joints water tight.
7. Groundwater control during excavation and construction of the clay liner is the responsibility of the contractor. Groundwater control must be provided such that it results in the stable and dry subgrade that is

- required for clay liner construction. An appropriate dewatering plan that could involve intercepting trenches, wells, pumps, sumps or other means to dewater the pond subgrade must be developed. The dewatering must be maintained throughout the entire liner construction process until the pond is completely filled to the permanent pool elevation.
8. Utilities with inlets/outlets below the permanent pond water level shall be completely backfilled with clay liner material, bentonite or another material acceptable to both the City of Austin and the geotechnical engineer.
  9. After completion of the compacted clay liner, the pond should be filled with water to the permanent pool elevation as soon as possible. Until the pond can be completely filled with water to the permanent pool elevation, the pond liner must be kept wet by watering the liner regularly such that cracks do not form in the liner surface.
  10. As required in the City of Austin Environmental Criteria Manual Section 1.6.2.C, a water balance study should be provided to determine the requirements for maintaining the proper pond water level should be conducted by the project civil engineer.
  11. The completed clay liner must have a minimum one-foot thick soil cover overlying the compacted liner surface. This layer may need to be thicker in the area of the vegetative bench based upon expected root depth of the plants to be placed in the wet pond. The roots of the plants in the vegetative bench should not penetrate the clay liner.
  12. For a pond to be constructed properly by an earthwork contractor, a set of plans including cross sections and details should be developed by the project civil engineer.

### **Section 3: Construction**

#### **A. Recommendations**

1. Any loose material shall be removed from the subgrade prior to clay liner construction. If the subgrade consists of soil, then the subgrade shall be scarified to a depth of 6 inches, moisture conditioned and recompacted in accordance with Section 3B Item 1. If the subgrade consists of weathered or intact limestone, the surface shall be reasonably cleaned of any loose material and moisture conditioning and recompaction shall not be required.
2. The clay liner shall be constructed monolithically in the bottom and side slopes of the pond.
3. Compact lifts of the subgrade and clay liner with properly ballasted penetrating pad foot compactors. A minimum of 2 passes shall be required on each lift. A pass is defined as one trip of compacting equipment over the lift and back to the starting point by a single drum roller or one trip across the lift surface from one side to the other if the roller has both front and back compacting rollers. This requirement is to allow thorough remolding of the clay layer by kneading action. The final 6-inch lift (surface layer) of the clay liner shall be compacted with a smooth-wheeled vibratory roller to provide a smooth finish to the completed clay liner.
4. Each clay liner lift shall satisfy the moisture and density requirements listed in Section 3B, Item 2 of this document before the next lift is placed.
5. Cracking and/or crusting of each lift surface shall be avoided as much as possible. If cracking and/or crusting of the lift surface occurs before placement of the next lift, this area shall be sprinkled with water, scarified to a depth below cracking/crusting, and recompacted as outlined in this section before placement of a subsequent lift.
6. During construction, finished lifts or portions of the compacted clay liner shall be kept wet enough to prevent drying and cracking of the clay.
7. Sections of liner that are constructed next to a completed section should not be constructed by "butting" the entire thickness of the new liner section next to the completed section. Instead, the edge of the completed section of clay liner shall be benched at mid-depth for a width of approximately 12 inches such that the section being newly constructed and the completed section are offset in a stair-step fashion without a construction joint through the entire liner thickness.

8. At the end of each day's construction, completed lifts or sections of compacted clay liner shall be sealed by rolling with a rubber tire or smooth drum roller and kept wet enough to prevent drying and cracking of the clay until liner construction resumes.
9. Any areas that do not meet the moisture or density requirements during compaction testing shall be reworked and retested until the material meets the specifications.

**B. Field Testing**

1. If the subgrade consists of soil, then the subgrade below the clay liner shall be compacted to at least 95 percent of the maximum dry density determined by the Standard Proctor Test, ASTM D 698. If the subgrade soil has a plasticity index (PI) of 25 or greater, then the moisture content at the time of compaction shall be between optimum and 4 percent above the optimum moisture content. If the subgrade soil has a plasticity index (PI) of less than 25, then the moisture content at the time of compaction shall be between 3 percent below (-3%) and 3 percent above (+3%) the optimum moisture content. If the subgrade consists of limestone or weathered limestone, then moisture and density control is not required.
2. The clay liner shall be compacted to at least 95 percent of the maximum dry density as determined by the Standard Proctor Test, ASTM D 698. The moisture content at time of compaction shall be at or above the optimum moisture content.
3. An individual lift or section shall be tested for moisture and density upon the completion of compaction (prior to subsequent lift or section placement) using a nuclear density gauge. The resulting penetration from the driving pin of the nuclear density gauge shall be back filled with bentonite powder. The compacted clay lift or section shall meet the project specifications listed in Item 2 of Section 3B for moisture and density prior to placement of additional clay liner material.
4. The frequency of testing of the clay liner during construction shall be governed by the following criteria.

Test	Test Requirement	Testing Frequency	Testing Standard
In Place Nuclear Density	Greater than 95%	1 per 5,000 sq. ft. per lift (minimum 3 per lift)	ASTM D 2922
In Place Nuclear Moisture	Greater than optimum	1 per 5,000 sq. ft. per lift (minimum 3 per lift)	ASTM D 3017
Liquid Limit	Greater Than 50	At 25%, 50%, 75% and 100% of liner construction	ASTM D 4318
Plasticity Index	Greater Than 30**	At 25%, 50%, 75% and 100% of liner construction	ASTM D 4318
% Passing # 200 Sieve	Greater Than 60 %	At 25%, 50%, 75% and 100% of liner construction	ASTM D 422
Maximum Particle Size	Less than 1 inch	At 25%, 50%, 75% and 100% of liner construction	ASTM D 422
Completed Liner Thickness	Surveyed Liner Thickness	At Beginning and End of Liner Construction	Surveyed by RPLS (See Item 5 below)
Thickness of Soil Cover Over Liner	Surveyed Soil Cover Thickness	At Beginning and End of Soil Cover Layer Placement	Surveyed by RPLS (See Item 5 below)

\*\* The Plasticity Index (PI) should be within 10 percentage points of the PI determined during testing of the proposed liner material (Section 1, Item 1).

5. As required in the City of Austin Environmental Criteria Manual Section 1.6.2.C.1., the as built thickness of the clay liner shall be determined by survey methods performed by a professional surveyor registered in the state of Texas. Prior to the placement of any portion of the clay liner, the excavation surface shall be surveyed in a sufficient manner to establish the pond bottom and sideslopes. Upon completion of the clay liner, and prior to the construction of any other pond elements, the top of the clay liner shall be surveyed to verify that the specified thickness of clay liner has been achieved, and the top of the clay liner is at the civil engineer's specified grades and slopes, within a tolerance of 0 to +0.2 feet. Areas that do not meet the



specified thickness, grades, and slopes shall be corrected and re-surveyed. The same data points should be used for both the pre and post liner construction surveys. The same data points should also be used to survey the pond upon completion of the soil cover layer to verify soil cover layer thickness over the pond liner.

6. Any repair required to fix damage to completed portions of the clay liner shall be governed by Section 4 of this document.
7. Areas that do not meet the moisture or density specifications during initial testing shall be reworked and retested until the material meets the specifications.

#### **Section 4: Repair**

1. For any area of the clay liner that becomes damaged during construction, the damaged area shall be overexcavated to at least one foot beyond the damaged area in all directions.
2. The full depth of the clay liner shall be reconstructed in the damaged area using the previous specifications.
3. Between undamaged liner and the damaged area, the clay liner shall be benched at mid-depth such that the area being repaired and the undisturbed liner are offset in a stair-step fashion without a construction joint through the entire liner thickness.
4. Compaction equipment that is appropriate for the size of the damaged area shall be utilized.
5. All repaired clay liner areas shall be tested against the project specifications for the moisture and density listed in Section 3B, Item 2 prior to acceptance.
6. Repairs that do not meet the density and moisture specifications shall be reworked and retested.

#### **Section 5: Documentation**

1. Test reports shall be issued for all tests performed and shall indicate whether the test result is in compliance with the project specifications.
2. The Construction Materials Testing (CMT) firm shall issue a daily representative's report. This report shall include, as a minimum:
  - Date of Testing
  - CMT field technician name
  - A description of the work performed during the day
  - The type(s) of equipment used by contractor
  - Tests performed by the CMT field technician
  - Any failed tests or non-compliant areas that require retesting or corrective action
3. After liner construction is complete and all test results are acceptable, a Soil and Liner Evaluation Report (SLER) shall be prepared by the CMT firm. This report shall be sealed by a professional engineer registered in the state of Texas. This letter shall summarize the types of tests performed and state that the results are in general conformance with the project plans and specifications referring to previous reports regarding the clay liner.
4. After completion of the post liner construction survey, the Professional Surveyor shall prepare and seal a letter documenting the surveying process and the thickness of the clay liner. This letter shall include as an attachment a drawing indicating survey point locations with elevations at each point for pre liner construction and post liner construction.

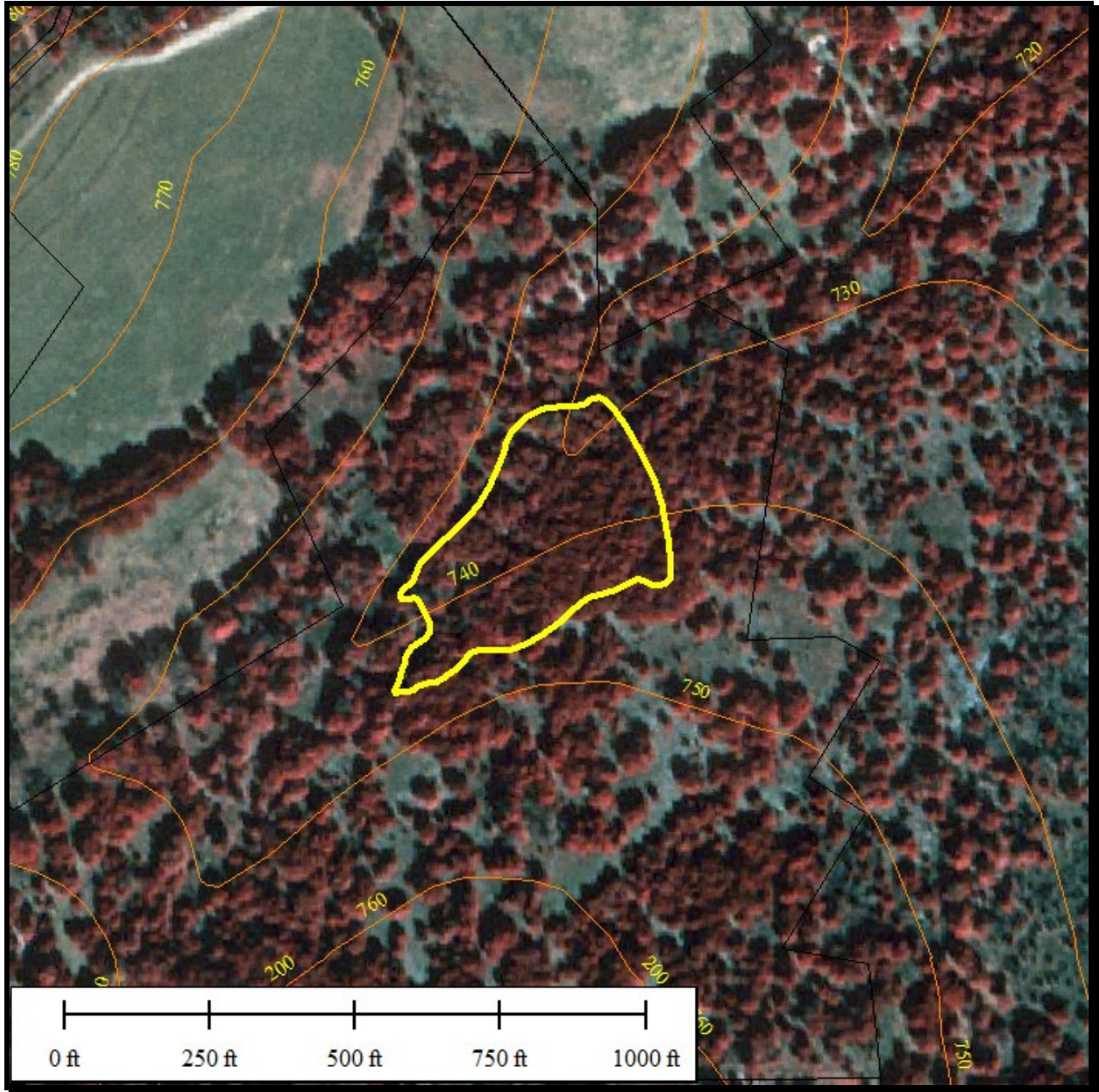
#### **Section 6: Test References**

1. ASTM D 422 - Standard Test Method for Particle Size Analysis of Soils
2. ASTM D 698 - Standard Test Method for Moisture-Density Relations of Soils and Soil Aggregate Mixtures
3. ASTM D 1140 - Standard Test Method for Amount of Material in Soils Finer Than the No.200 Sieve

4. ASTM D 2216 - Standard Test Method for Laboratory Determination of Water (moisture) Content of Soil, Rock, and Soil Aggregate Mixtures
5. ASTM D 2487 - Classification of Soils for Engineering Purposes
6. ASTM D 2922 - Standard Test Method for Density of Soil and Soil-Aggregate In Place by Nuclear Methods
7. ASTM D 3017 - Standard Test Method for Moisture Content of Soils in Place by Nuclear Method
8. ASTM D 4318 - Standard Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
9. ASTM D 5084 - Standard Test Method for Permeability of Fine Grained Soils

**APPENDIX A**  
**GEOTECHNICAL DATA**





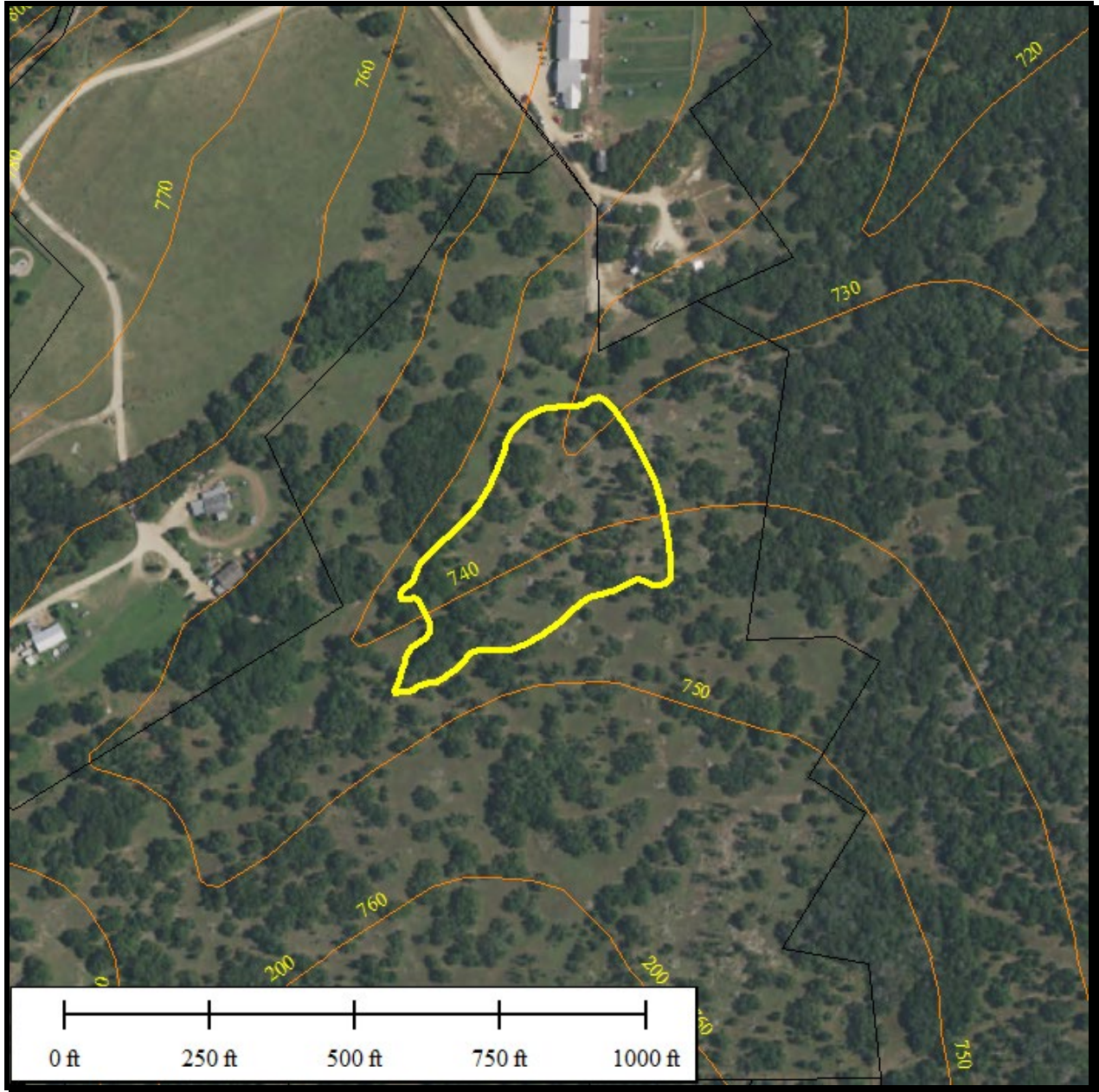
**Approximate location of site in yellow  
CAPCOG contours (2008) in orange  
Hays County parcels (2021) in black**

### **NAPP Aerial Photograph of Site – 1995**

Source: TEXAS NATURAL RESOURCES INFORMATION SYSTEM  
3.75-minute DOQQ. 1-meter ground resolution. apx. date 1995-6  
(<http://www.tnris.state.tx.us/digital.htm>)





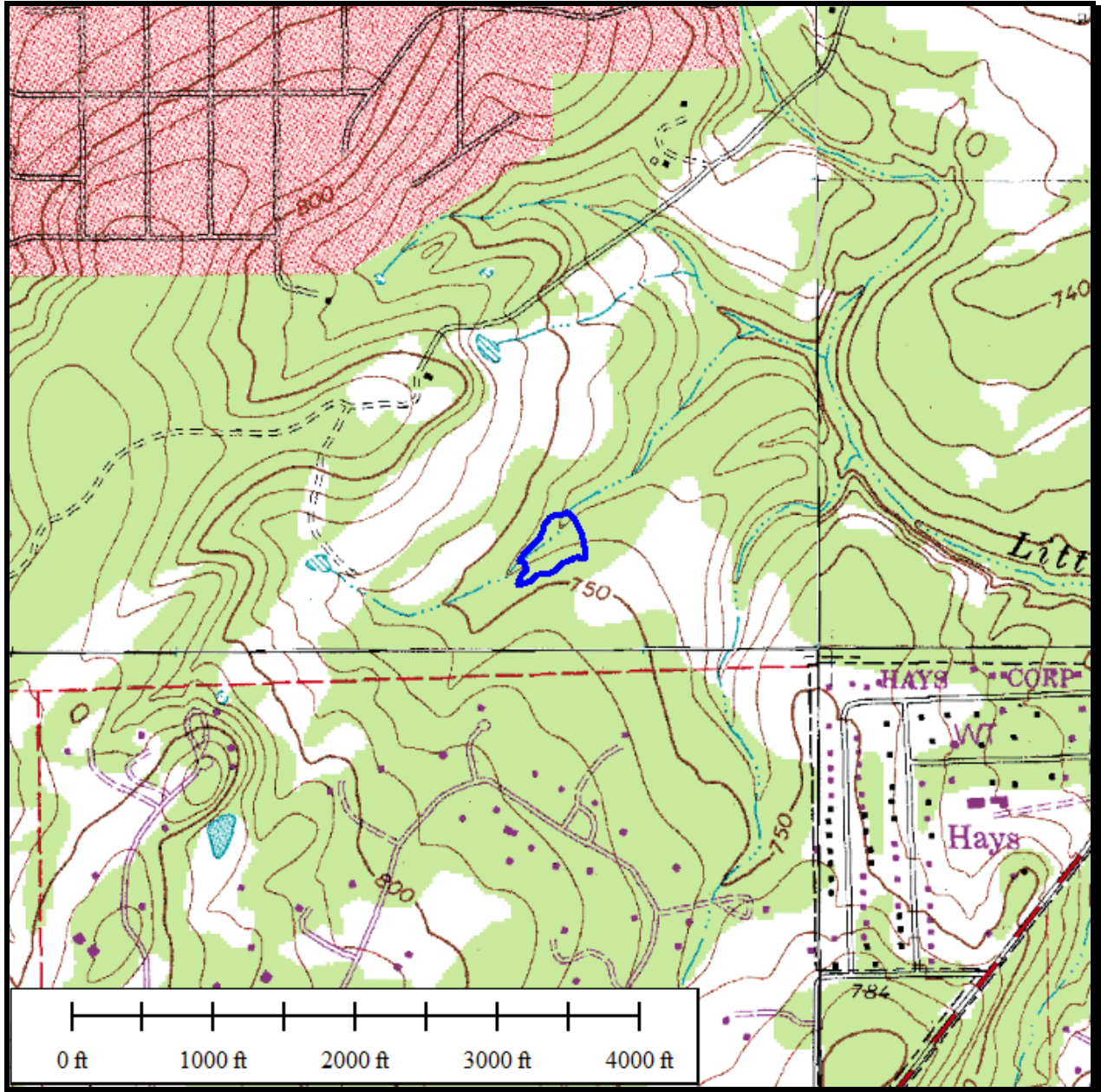


**Approximate location of site in yellow  
CAPCOG contours (2008) in orange  
Hays County parcels (2021) in black**

### **Aerial Photograph of Site – 2020**

Source: TEXAS NATURAL RESOURCES INFORMATION SYSTEM  
Apx. Date - 2020  
(<https://tnris.org/>)





**Approximate location of site in blue**

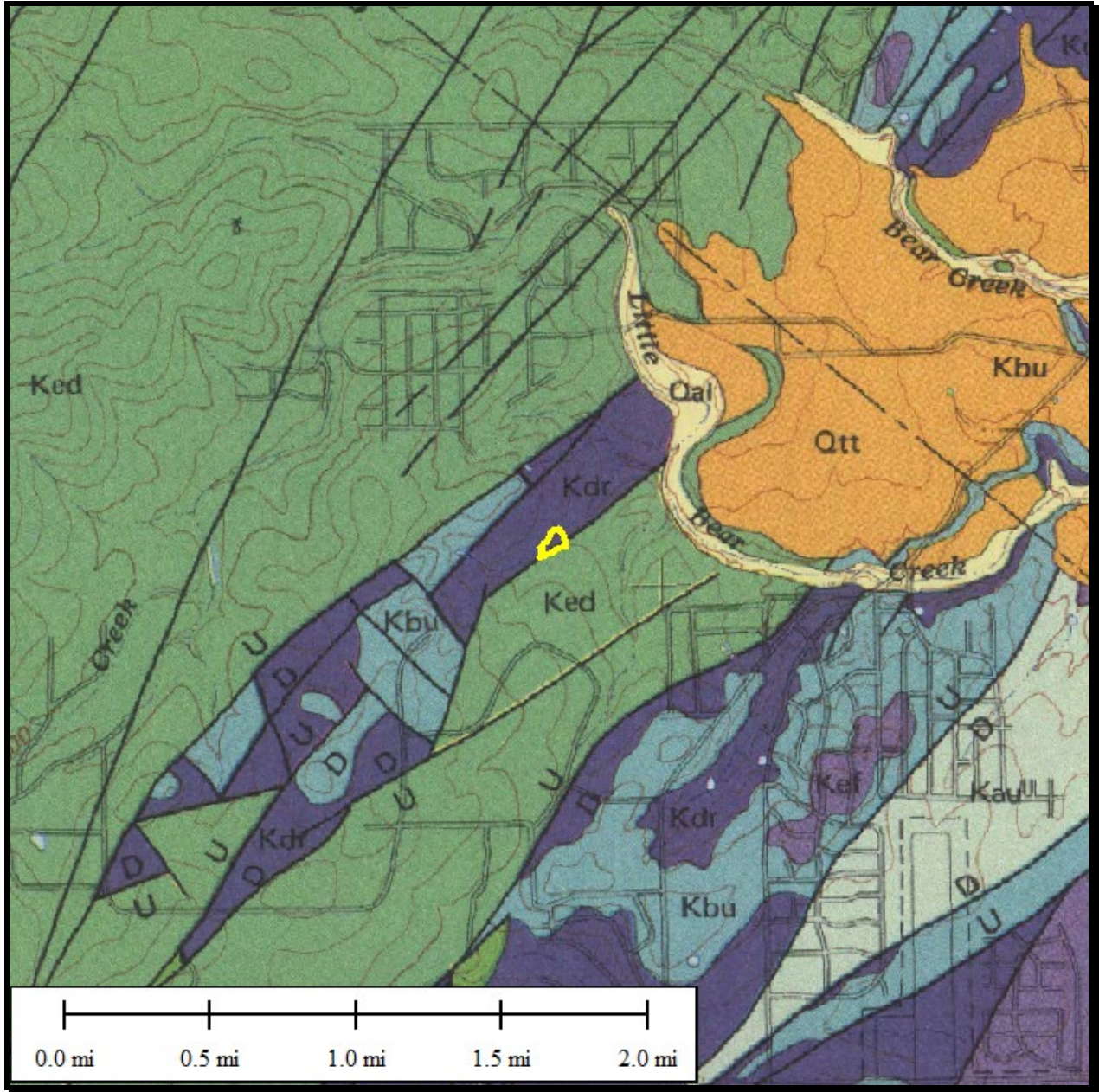
**U.S. 7.5 Minute Series Topographic Map  
Signal Hill Quadrangle, Texas**

**Contour Interval = 10 feet**

Source: TEXAS NATURAL RESOURCES INFORMATION SYSTEM  
(<http://www.tnris.state.tx.us/digital.htm>)





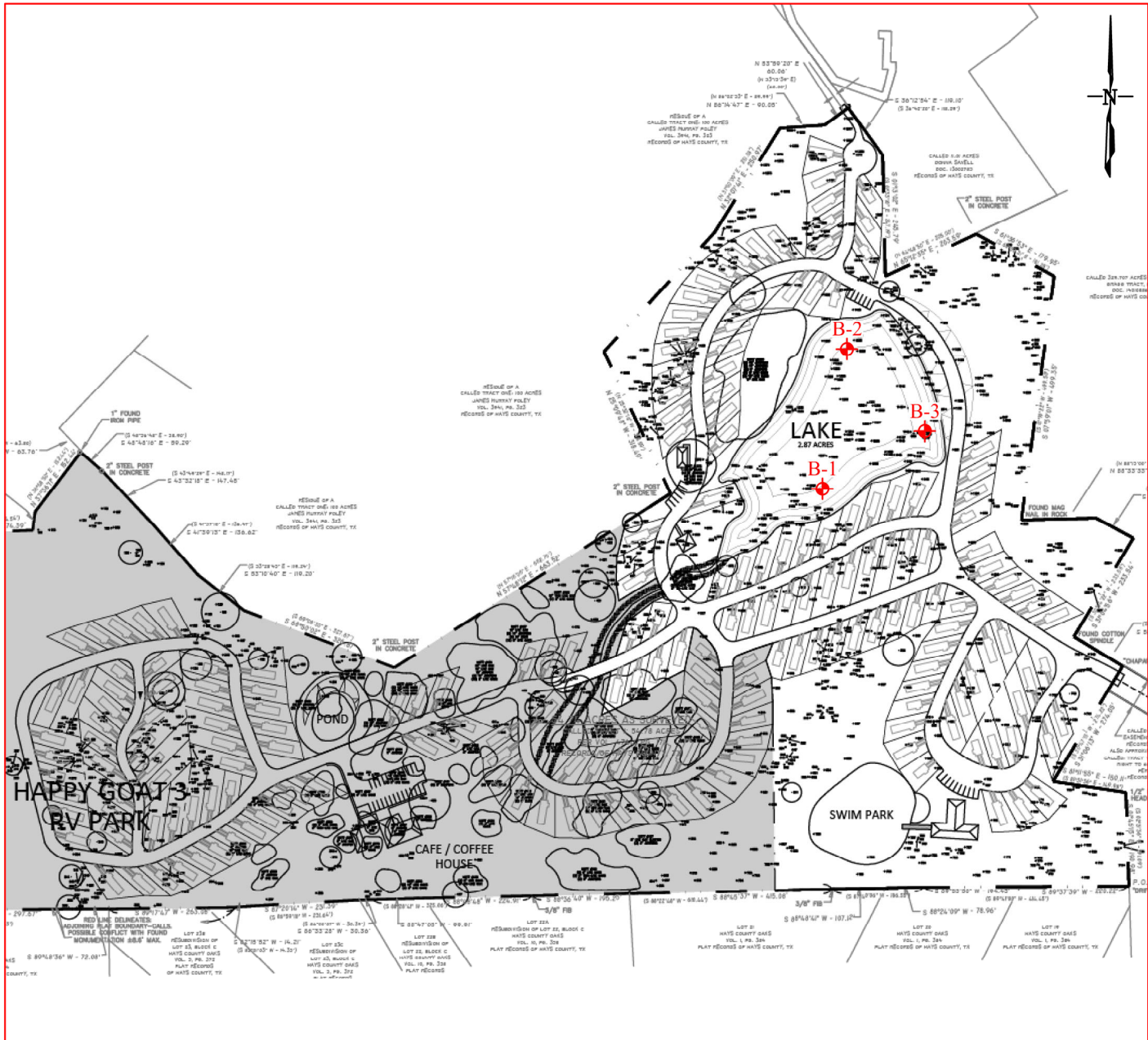


Approximate location of site in yellow

**Geologic Setting of Site**  
**Geologic Map of the Austin Area, Texas 1992**  
 Contour Interval = 20 feet

Source: Bureau of Economic Geology, The University of Texas at Austin, Plate VII





SCALE = N.T.S.

PAGE 1 OF 1

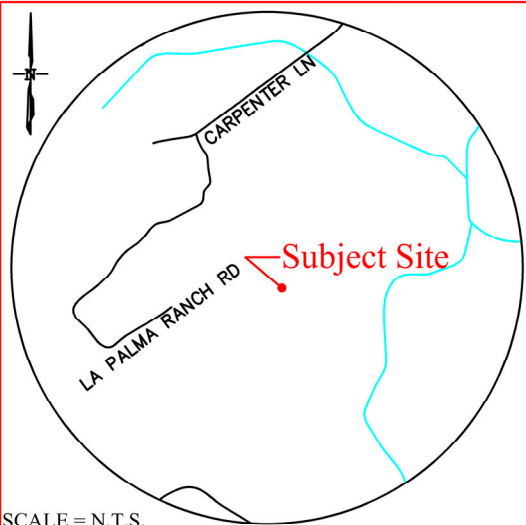
## PLAN OF BORINGS

Stinson-Hays RV Park Lake  
 Manchaca, Texas  
 Job. No.: 22103100.013  
 Client: Jacquelyn Bruegging

### LEGEND

- |     |                         |
|-----|-------------------------|
| B-# | Boring Number           |
|     | Approx. Boring Location |

VICINITY MAP



SCALE = N.T.S.





*"put us to the test"*

## LOG OF BORING

**Boring B-1**  
PAGE 1 OF 1

**Job Name:** Stinson-Hays RV Park Lake  
**Job Location:** Manchaca, Texas  
**Engineer's Job #:** 22103100.013  
**Client:** Jacquelyn Bruegging

**Drill Date:** September 19, 2022  
**Hole Size:** 4.5 in.

**Ground Elevation:** n/a

**Ground Water Levels:**

AT TIME OF DRILLING: ---  
 AT END OF DRILLING: ---  
 AFTER DRILLING: ---

**Notes:** Early termination due to auger refusal into very hard limestone

DEPTH, ft.	GRAPHIC LOG	MATERIAL DESCRIPTION	GEOLOGY U.S.C.S.	POCKET PEN. (tsf)	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>-2um <span style="color: red;">★</span></p> <p>-#200 <span style="color: red;">□</span></p> <p>-#4 <span style="color: red;">▲</span></p> <p>● Moisture Content, %</p> </div> <div style="text-align: center;"> <p>PL <span style="color: red;">—</span> LL</p> </div> </div>	Plasticity Index, %
0		CLAY, tan, with limestone fragments, damp	CL			
5		LIMESTONE, pale brown, very hard, dry				
10		Termination Depth: 9.7 feet	Ked			
15						
20						
25						
30						

22103100.013 - STINSON-HAYS RV PARK LAKE - LOGS.GPJ 10/4/22



*"put us to the test"*

## LOG OF BORING

**Boring B-2**  
PAGE 1 OF 1

**Job Name:** Stinson-Hays RV Park Lake  
**Job Location:** Manchaca, Texas  
**Engineer's Job #:** 22103100.013  
**Client:** Jacquelyn Bruegging

**Drill Date:** September 19, 2022  
**Hole Size:** 4.5 in.

**Ground Elevation:** n/a

**Ground Water Levels:**

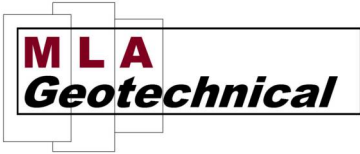
AT TIME OF DRILLING: ---  
 AT END OF DRILLING: ---  
 AFTER DRILLING: ---

**Notes:** Early termination due to auger refusal into very hard limestone

DEPTH, ft.	GRAPHIC LOG	MATERIAL DESCRIPTION	GEOLOGY U.S.C.S.	POCKET PEN. (tsf)	<div style="text-align: center;"> <span style="color: purple;">-2um</span>    <span style="color: purple;">-#200</span>    <span style="color: purple;">-#4</span>  <span style="color: blue;">●</span> Moisture Content, %  <span style="color: red;">PL</span> ————— <span style="color: red;">LL</span> </div>	Plasticity Index, %
0		CLAY, tan, with limestone fragments, damp LIMESTONE, pale brown, very hard, dry	CL			
5			Ked			
10		Termination Depth: 7.1 feet				
15						
20						
25						
30						

22103100.013 - STINSON-HAYS RV PARK LAKE - LOGS.GPJ 10/4/22





*"put us to the test"*

## LOG OF BORING

**Boring B-3**  
PAGE 1 OF 1

**Job Name:** Stinson-Hays RV Park Lake  
**Job Location:** Manchaca, Texas  
**Engineer's Job #:** 22103100.013  
**Client:** Jacquelyn Bruegging

**Drill Date:** September 19, 2022  
**Hole Size:** 4.5 in.

**Ground Elevation:** n/a

**Ground Water Levels:**



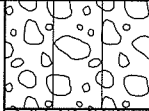
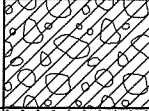
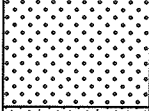
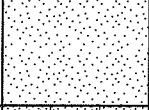
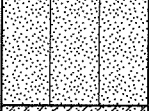
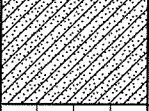
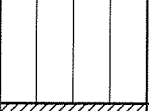
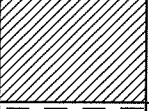
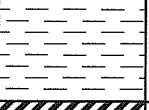
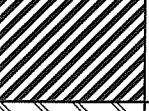
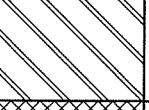
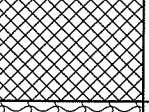
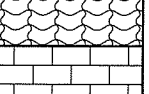
AT TIME OF DRILLING: ---  
 AT END OF DRILLING: ---  
 AFTER DRILLING: ---

**Notes:** Early termination due to auger refusal into very hard limestone

DEPTH, ft.	GRAPHIC LOG	MATERIAL DESCRIPTION	GEOLOGY U.S.C.S.	POCKET PEN. (tsf)	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>-2um <span style="color: red;">★</span></p> <p>-#200 <span style="color: red;">□</span></p> <p>-#4 <span style="color: red;">▲</span></p> <p>● Moisture Content, %</p> </div> <div style="text-align: center;"> <p>PL <span style="color: red;">—</span> LL</p> </div> </div>	Plasticity Index, %
0	▨	CLAY, tan, with limestone fragments, damp	CL			
5	▨	LIMESTONE, pale brown, very hard, dry				
10	▨	Termination Depth: 9.6 feet	Ked			
15	▨					
20	▨					
25	▨					
30	▨					

22103100.013 - STINSON-HAYS RV PARK LAKE - LOGS.GPJ 10/4/22

# SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS	
			GRAPH	LETTER		
<b>COARSE GRAINED SOILS</b>  MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	<b>GRAVEL AND GRAVELLY SOILS</b>  (LITTLE OR NO FINES)	CLEAN GRAVELS		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		(LITTLE OR NO FINES)		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES	
		GRAVELS WITH FINES		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES	
		(APPRECIABLE AMOUNT OF FINES)		<b>GC</b>	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES	
	<b>SAND AND SANDY SOILS</b>  MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE  MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
		(LITTLE OR NO FINES)		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES	
		SANDS WITH FINES		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES	
		(APPRECIABLE AMOUNT OF FINES)		<b>SC</b>	CLAYEY SANDS, SAND - CLAY MIXTURES	
		<b>FINE GRAINED SOILS</b>  MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	<b>SILTS AND CLAYS</b>  LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
					<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
	<b>OL</b>			ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
<b>CLAYS</b>  LIQUID LIMIT GREATER THAN 50		<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY			
SOILS OF MODERATE PLASTICITY				<b>CL-CH</b>	LOW PI CLAYS WITH APPRECIABLE HIGH PI MOTTLING, CLAY WITH BORDERLINE CLASSIFICATION	
OTHER MATERIALS				<b>FILL</b>	MATERIAL NOT NATURALLY DEPOSITED	
				<b>LS</b>	WEATHERED LIMESTONE  INTACT LIMESTONE	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

# Key to Terms and Abbreviations

Descriptive Terms Characterizing Soils and Rock	Standard Description Abbreviations and Terms	Symbols and Abbreviations for Test Data
<p><b>Argillaceous</b> – having appreciable amounts of clay in the soil or rock mass. Used most often in describing limestones, occasionally sandstones.</p> <p><b>Calcareous</b> – containing appreciable quantities of calcium carbonate. Can be either nodular or “powder.”</p> <p><b>Crumbly</b> – cohesive soils which break into small blocks or crumbs on drying.</p> <p><b>Evaporite</b> – deposits of salts and other soluble compounds. Most commonly calcium carbonate or gypsum. May be in either “powder” or visible crystal form.</p> <p><b>Ferruginous</b> – having deposits of iron or nodules, typically oxidized and dark red in color.</p> <p><b>Ferrous</b> – see Ferruginous</p> <p><b>Fissured</b> – containing shrinkage cracks frequently filled with fine sand or silt, usually more or less vertical.</p> <p><b>Fossiliferous</b> – containing appreciable quantities of fossils, fossil fragments, or traces of fossils</p> <p><b>Laminated</b> – composed of thin layers of varying color or texture. Layers are typically distinct and varying in composition from sand to silt and clay.</p> <p><b>Mottled</b> – characterized as having multiple colors organized in a marbled pattern.</p> <p><b>Slickensided</b> – having inclined planes of weakness that are slick and glossy in appearance.</p> <p><b>Varved</b> – see Laminated.</p>	<p>brn = brown                      dk = dark                      lt = light                      wx = weathered                      calc = calcareous                      sw = severely weathered                      cw = completely weathered                      n/a = not available                      b. = below</p> <p><b>Engineering Units</b>                      pcf = pounds per cubic foot                      psf = pounds per square foot                      tsf = tons per square foot                      pF = picofarad                      psi = pounds per square inch                      kips = thousand pounds (force)                      ksf = kips per square foot</p>	<p>LL = Liquid Limit                      PL = Plastic Limit                      PI = Plasticity Index (LL-PL)                      NP = non-plastic  <math>\gamma_d</math> = dry unit weight  <math>q_u</math> = unconfined compressive strength  <math>q_c</math> = confined compressive strength                      SPT = standard penetration test                      TCP = Texas cone penetration test (Texas Highway Department)                      N or <math>N_{SPT}</math> = blows per foot from SPT  <math>N_{TCP}</math> = blows per foot from TCP                      SCR = standard core recovery                      RQD = rock quality designation                      RQI = see RQD</p>

## Terms Describing Consistency of Soil and Rock

COARSE GRAINED MATERIAL		SEDIMENTARY ROCK	
DESCRIPTIVE TERM	BLOWS/FT (SPT)	DESCRIPTIVE TERM	STRENGTH, TSF
very loose	0 – 4	soft	4 – 8
loose	4 – 10	medium	8 – 15
firm (medium)	10 – 30	hard	15 – 50
dense	30 – 50	very hard	over 50
very dense	over 50		

## Describing Consistency of Fine Grained Soil

DESCRIPTIVE TERM	BLOWS/FT (SPT)	UNCONFINED COMPRESSION, TSF
very soft	< 2	< 0.25
soft	2 – 4	0.25 – 0.50
medium stiff	4 – 8	0.50 – 1.00
stiff	8 – 15	1.00 – 2.00
very stiff	15 – 30	2.00 – 4.00
hard	over 30	over 4.00

## Sample Type Key

	Auger Cuttings
	Shelby Tube
	Split Spoon (SPT)
	Texas Cone (TCP)
	Rock Core
	No Sample

Revised: October 2018

**APPENDIX B**

**STANDARD FIELD AND LABORATORY PROCEDURES**

# STANDARD FIELD AND LABORATORY PROCEDURES

## STANDARD FIELD PROCEDURES

### *Drilling and Sampling*

Borings and test pits are typically staked in the field by the drillers, using simple taping or pacing procedures and locations are assumed to be accurate to within several feet. Unless noted otherwise, ground surface elevations (GSE) when shown on logs are estimated from topographic maps and are assumed to be accurate to within a foot. A Plan of Borings or Plan of Test Pits showing the boring locations and the proposed structures is provided in the Appendix.

A log of each boring or pit is prepared as drilling and sampling progressed. In the laboratory, the driller's classification and description is reviewed by a Geotechnical Engineer. Individual logs of each boring or pit are provided in the Appendix. Descriptive terms and symbols used on the logs are in accordance with the Unified Soil Classification System (ASTM D-2487). A reference key is also provided. The stratification of the subsurface material represents the soil conditions at the actual boring locations, and variations may occur between borings. Lines of demarcation represent the approximate boundary between the different material types, but the transition may be gradual.

A truck-mounted rotary drill rig utilizing rotary wash drilling or continuous flight hollow or solid stem auger procedures is used to advance the borings, unless otherwise noted. A backhoe provided by others is used to place test pits. Test pits are advanced to the required depth, refusal (typically bedrock) or to the limits of the equipment. Samples of soil are obtained from the borings or test pit spoils for subsequent laboratory study. Samples are sealed in plastic bags and marked as to depth and boring/pit locations in the field. Cores are wrapped in a polyethylene wrap to preserve field moisture conditions, placed in core boxes and marked as to depth and core runs. Unless notified to the contrary, samples and cores will be stored for 90 days, then discarded.

### *Standard Penetration Test and Split-Barrel Sampling of Soils (ASTM D-1586) (SPT)*

This sampling method consists of driving a 2 inch outside diameter split barrel sampler using a 140 pound hammer freely falling through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven an additional 12 inches. The number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance. The results of the SPT is recorded on the boring logs as "N" values.

### *Thin-Walled Tube Sampling of Soils (ASTM D-1587) (Shelby Tube Sampling)*

This method consists of pushing thin walled steel tubes, usually 3 inches in diameter, into the soils to be sampled using hydraulic pressure or other means. Cohesive soils are usually sampled in this manner and relatively undisturbed samples are recovered.

### ***Soil Investigation and Sampling by Auger Borings (ASTM D-1452)***

This method consists of auguring a hole and removing representative soil samples from the auger flight or bit at intervals or with each change in the substrata. Disturbed samples are obtained and this method is, therefore, limited to situations where it is satisfactory to determine the approximate subsurface profile and obtain samples suitable for Index Property testing.

### ***Diamond Core Drilling for Site Investigation (ASTM D-2113)***

This method consists of advancing a hole into hard strata by rotating a single or double tube core barrel equipped with a cutting bit. Diamond, tungsten carbide, or other cutting agents may be used for the bit. Wash water or air is used to remove the cuttings and to cool the bit. Normally, a 3 inch outside diameter by 2-1/8 inch inside diameter coring bit is used unless otherwise noted. The rock or hard material recovered within the core barrel is examined in the field and in the laboratory and the cores are stored in partitioned boxes. The intactness of all rock core specimens is evaluated in two ways. The first method is the Standard Core Recovery (SCR) expressed as the length of the total core recovered divided by the length of the core run, expressed as a percentage:

$$\text{SCR} = \frac{\text{total core length recovered}}{\text{length of core run}} \times 100\%$$

This value is exhibited on the boring logs as the Standard Core Recovery (SCR).

The second procedure for evaluating the intactness of the rock cores is by Rock Quality Designation (RQD). The RQD provides an additional qualitative measure of soundness of the rock. This index is determined by measuring the intact recovered core unit which exceed four inches in length divided by the total length of the core run:

$$\text{RQD} = \frac{\text{all core lengths greater than 4"}}{\text{length of core run}} \times 100\%$$

The RQD is also expressed as a percentage and is shown on the boring logs.

### ***Vane Shear Tests***

In-situ vane shear tests may be used to determine the shear strength of soft to medium cohesive soil. This test consists of placing a four-bladed vane in the undisturbed soil and determining the torsional force applied at the ground surface required to cause the cylindrical perimeter surface of the vane to be sheared. The torsional force sufficient to cause shearing is converted to a unit of shearing resistance or cohesion of the soil surrounding the cylindrical surface.

### ***THD Cone Penetrometer Test***

The THD Cone Penetrometer Test is a standard field test to determine the relative density or consistency and load carrying capacity of foundation soils. This test is performed in much the same manner as the Standard Penetration Test described above. In this test, a 3 inch diameter penetrometer cone is used in place of a split-spoon sampler. This test calls for a 170-pound weight falling 24 inches. The actual test in hard materials consists of driving the penetrometer cone and accurately recording the inches of penetration for the first and second 50 blows for a total of 100 blows. These results are then correlated using a table of load capacity vs. number of inches penetrated per 100 blows.

### ***Pocket Penetrometer Test***

A pocket penetrometer or hand penetrometer is a small device used to estimate the shear capacity or unconfined compressive strength of a soil sample. The device consists of a spring-loaded probe which measures the pressure required to penetrate the probe into a soil sample for specified depth. This test can only be performed on cohesive soil samples. This pressure is reported in tons per square foot (tsf) on the Logs of Boring. A hyphen (-) indicates that the soil sample was too loose or too soft to perform the test. This test is considered rudimentary and too inaccurate to be used for direct design parameters; however, this test is useful for correlations among soil strata and general stiffness descriptions.

### ***Ground Water Observation***

Ground moisture observations are made during the operations and are reported on the logs of boring or pit. Moisture condition of cuttings are noted, however, the use of water for circulation precludes direct observation of wet conditions. Water levels after completing the borings or pits are noted. Seasonal variations, temperatures and recent rainfall conditions may influence the levels of the ground water table and water may be present in excavations, even though not indicated on the logs.



## STANDARD LABORATORY PROCEDURES

To adequately characterize the subsurface material at this site, some or all of the following laboratory tests are performed. The results of the actual tests performed are shown graphically on the Logs of Boring or Pit.

### ***Moisture Content - ASTM D-2216***

Natural moisture contents of the samples (based on dry weight of soil) are determined for selected samples at depths shown on the respective boring logs. These moisture contents are useful in delineating the depth of the zone of moisture change and as a gauge of correlation between the various index properties and the engineering properties of the soil. For example, the relationship between the plasticity index and moisture content is a source of information for the correlation of shear strength data.

### ***Dry Density - ASTM D-7263***

The dry density,  $\gamma_d$ , (bulk density or unit weight) of the samples is determined for selected samples at depths shown on the respective boring logs using Method B of the aforementioned ASTM standard. The in-situ density was determined from undisturbed SPT samples and the dry density was calculated using moisture content results. These dry density values are useful for calculating other characteristic values such as porosity, void ratio, and mass composition of soil. Additionally, these values can also be used to assess the degree of compaction or consolidation of fill materials.

### ***Atterberg Limits - ASTM D-4318***

The Atterberg Limits are the moisture contents at the time the soil meets certain arbitrarily defined tests. At the moisture content defined as the plastic limit,  $P_w$ , the soil is assumed to change from a semi-solid state to a plastic state. By the addition of more moisture, the soil may be brought up to the moisture content defined as the liquid limit,  $L_w$ , or that point where the soil changes from a plastic state to a liquid state. A soil existing at a moisture content between these two previously described states is said to be in a plastic state. The difference between the liquid limit,  $L_w$ , and the plastic limit,  $P_w$ , is termed the plasticity index,  $I_w$ . As the plasticity index increases, the ability of a soil to attract water and remain in a plastic state increases. The Atterberg Limits that were determined are plotted on the appropriate log.

The Atterberg Limits are quite useful in soil exploration as an indexing parameter. Using the Atterberg Limits and grain size analysis, A. Casagrande developed the Unified Soils Classification System (USCS) which is widely used in the geotechnical engineering field. This system related the liquid limit to the plasticity index by dividing a classification chart into various zones according to degrees of plasticity of clays and silts. Although the Atterberg Limits are an indexing parameter, K. Terzaghi has related these limits to various engineering properties of a soil. Some of these relationships are as follows:

1. As the grain size of the soil decreases, the Atterberg Limits increase.
2. As the percent clay in the soil increases, the Atterberg Limits increase.
3. As the shear strength increases, the Atterberg Limits decrease.
4. As the compressibility of a soil increases, the Atterberg Limits increase.

### ***Free Swell Test - ASTM D-4546-96***

The free swell test assesses the potential for swell of soil. This value is useful for the design of various structures such as slab-on-ground foundations, piers and piles, and underground utilities. Method B of the aforementioned ASTM standard determines the amount of swell (vertical heave) of a sample. This is done by placing the sample in a consolidometer under a seating load equal to the overburden pressure and giving the sample free access to water. The height is measured and the swell is calculated as the vertical displacement divided by the original height of the specimen. The results of these tests are presented on the Logs of Boring at the depth of the samples tested.

### ***Swell Pressure Test - ASTM D-4546-96***

The swell pressure test assesses the potential for swell of soil. This value is useful for the design of various structures such as slab-on-ground foundations, piers and piles, and underground utilities. Method C of the aforementioned ASTM standard determines the pressure required to keep a soil sample at equilibrium under swelling conditions. This is done by placing the sample in a consolidometer under a seating load and giving the sample free access to water. A constant height of the sample is maintained and the vertical pressure on the sample is adjusted until equilibrium is reached. The vertical pressure on the sample at equilibrium is reported as the swell pressure. The results of these tests are presented on the Logs of Boring at the depth of the samples tested.

### ***Soil Suction Test - ASTM D-5298-94***

Soil suction (potential) tests are performed to determine both the matric and total suction values for the samples tested. Soil suction measures the free energy of the pore water in a soil. In a practical sense, soil suction is an indication of the affinity of a given soil sample to retain water. Soil suction provides useful information on a variety of characteristics of the soil that are affected by the soil water including volume change, deformation, and strength.

Soil suction tests are performed using the filter paper method per ASTM D-5298. Results of these tests are shown graphically on the logs of boring and tabulated in summary sheet of laboratory data.

For matric suction values found using this method, it should be noted that when the soil is in a dry state adequate contact between the filter paper and the soil may not be possible. This lack of contact may result in the determination of total suction instead of matric suction.

### ***Triaxial Shear Test - ASTM D-2850-70***

Triaxial tests may be performed on samples that are approximately 2.83 inches in diameter, unless a smaller diameter sample was necessary to achieve a more favorable length:diameter (L:D) ratio. A minimum length to diameter ratio (L:D) of 2.0 is maintained to reduce end effects.

The triaxial tests are typically unconsolidated-undrained using nitrogen gas for chamber confining pressure. Confining pressures are selected to conform to in-situ hydrostatic pressure considering the earth to be a fluid of 120 pcf. In this test, undisturbed Shelby tube samples are trimmed so that their ends are square and then pressed in a triaxial compression machine. The load at which failure occurs is the compressive strength. The results of the triaxial tests and the correlated hand penetrometer strengths can be utilized to develop soil shear strength values. These test provide the confined compressive strength,  $q_c$ , which are presented on the Logs of Boring at the depth of the samples tested.

### ***Unconfined Compressive Strength of Rock Cores - ASTM D-2938***

The unconfined compressive strength,  $q_u$ , is a valuable parameter useful in the design of foundation footings. This value,  $q_u$ , is related to the shearing resistance of the rock and thus to the capacity of the rock to support a load. In completing this test it is imperative that the length:diameter ratio of the core specimens are maintained at a minimum of 2:1. This ratio is set so that the shear plane will not extend through either of the end caps. If the ratio is less than 2.0 a correction is applied to the result.

### ***Grain Size Analysis - ASTM D-421 and D-422***

Grain size analysis tests are performed to determine the particle size and distribution of the samples tested. The grain size distribution of the soils coarser than the Standard Number 200 sieve is determined by passing the sample through a standard set of nested sieves, and the distribution of sizes smaller than the No. 200 sieve is determined by a sedimentation process, using a hydrometer. The results are given on the log of Boring/Pit or on Grain Size Distribution semi-log graphs within the report.

### ***Slake Durability Test - ASTM D-4644***

The slake durability test provides an index for the durability of a shale, or similar rock, considering the effects of wetting, drying, and abrasion. This index is used to quantify the strength of weak rock formations when exposed to natural wetting and drying cycles, especially in the context of underground tunneling and excavation. The index,  $I_d(2)$ , represents the percentage, by mass, of rock material retained after two wetting and drying cycles. These cycles are simulated by oven drying the sample followed by ten minutes of tumbling and soaking in water within a drum and trough apparatus. After tumbling and soaking, the sample is oven-dried and the mass of the sample is recorded. The results of these tests are presented on the Logs of Boring at the depth of the samples tested.

### ***Brazilian Tensile Strength - ASTM D-3967***

The Brazilian (splitting) tensile strength,  $\sigma_t$ , is useful in rock mechanics design, especially in regard to tunneling. This value is an indirect representation of the true uniaxial tensile strength. The Brazilian test is typically used more commonly than direct tensile strength tests because it is less difficult, more cost effective, and more represented of in-situ conditions. The test is conducted by mechanically compressing a rock core sample along its vertical diameter, causing the sample to fail due to tension along the horizontal diameter caused by the Poisson effect.

### ***CERCHAR Abrasivity Index (CAI) Test - ASTM D-7625***

The CERCHAR Abrasivity Index (CAI) is used to determine the abrasivity of rocks. This is particularly useful in assessing the potential wearing on cutting tools during excavation. The CAI of a rock is determined by the CERCHAR test, which consists of scraping steel pins across a rock surface and measuring the wear of each pin. The rock specimen is held in a mechanical vice, while a conical steel pin fastened to a 15-pound head is drug across the face of the specimen using a lever being pulled 1 centimeter in 1 second. The CAI is calculated based on the resultant diameter on the end of the pin.





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## IV.

# Water Pollution Abatement Plan Application Form (TCEQ-0584)

# Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b), Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: Henry Juarez

Date: 9/1/2022

Signature of Customer/Agent:



Regulated Entity Name: Carpenter Ranch RV Park

## Regulated Entity Information

1. The type of project is:

- Residential: Number of Lots: \_\_\_\_\_
- Residential: Number of Living Unit Equivalents: \_\_\_\_\_
- Commercial
- Industrial
- Other: RV Park

2. Total site acreage (size of property): 54.7

3. Estimated projected population: N/A

4. The amount and type of impervious cover expected after construction are shown below:

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	94576.35	÷ 43,560 =	2.17
Parking		÷ 43,560 =	
Other paved surfaces	127370.99	÷ 43,560 =	2.92
Total Impervious Cover	221946.34	÷ 43,560 =	5.095

Total Impervious Cover 5.095 ÷ Total Acreage 54.7 X 100 = 9.31% Impervious Cover

5.  Attachment A - Factors Affecting Surface Water Quality. A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.
6.  Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

*For Road Projects Only*

Complete questions 7 - 12 if this application is exclusively for a road project.

7. Type of project:

- TXDOT road project.
- County road or roads built to county specifications.
- City thoroughfare or roads to be dedicated to a municipality.
- Street or road providing access to private driveways.

8. Type of pavement or road surface to be used:

- Concrete
- Asphaltic concrete pavement
- Other: \_\_\_\_\_

9. Length of Right of Way (R.O.W.): \_\_\_\_\_ feet.

Width of R.O.W.: \_\_\_\_\_ feet.

L x W = \_\_\_\_\_ Ft<sup>2</sup> ÷ 43,560 Ft<sup>2</sup>/Acre = \_\_\_\_\_ acres.

10. Length of pavement area: \_\_\_\_\_ feet.

Width of pavement area: \_\_\_\_\_ feet.

L x W = \_\_\_\_\_ Ft<sup>2</sup> ÷ 43,560 Ft<sup>2</sup>/Acre = \_\_\_\_\_ acres.

Pavement area \_\_\_\_\_ acres ÷ R.O.W. area \_\_\_\_\_ acres x 100 = \_\_\_\_\_ % impervious cover.

11.  A rest stop will be included in this project.
- A rest stop will not be included in this project.

12.  Maintenance and repair of existing roadways that do not require approval from the TCEQ Executive Director. Modifications to existing roadways such as widening roads/adding shoulders totaling more than one-half (1/2) the width of one (1) existing lane require prior approval from the TCEQ.

### *Stormwater to be generated by the Proposed Project*

13.  Attachment B - Volume and Character of Stormwater. A detailed description of the volume (quantity) and character (quality) of the stormwater runoff which is expected to occur from the proposed project is attached. The estimates of stormwater runoff quality and quantity are based on the area and type of impervious cover. Include the runoff coefficient of the site for both pre-construction and post-construction conditions.

### *Wastewater to be generated by the Proposed Project*

14. The character and volume of wastewater is shown below:

<u>100%</u> Domestic	<u>&lt;5,000</u> Gallons/day
<u>      </u> % Industrial	<u>      </u> Gallons/day
<u>      </u> % Commingled	<u>      </u> Gallons/day
TOTAL gallons/day <u>      </u>	

15. Wastewater will be disposed of by:

On-Site Sewage Facility (OSSF/Septic Tank):

Attachment C - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

Sewage Collection System (Sewer Lines):

Private service laterals from the wastewater generating facilities will be connected to an existing SCS.

Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

The SCS was previously submitted on       .

The SCS was submitted with this application.

The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.



The sewage collection system will convey the wastewater to the \_\_\_\_\_ (name) Treatment Plant. The treatment facility is:

- Existing.  
 Proposed.

16.  All private service laterals will be inspected as required in 30 TAC §213.5.

### *Site Plan Requirements*

*Items 17 – 28 must be included on the Site Plan.*

17.  The Site Plan must have a minimum scale of 1" = 400'.

Site Plan Scale: 1" = 400'.

18. 100-year floodplain boundaries:

Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA MAP NO. 48209C0145F AND 48209C0260F DATED 9/2/05

19.  The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.

The layout of the development is shown with existing contours at appropriate, but not greater than ten-foot intervals. Finished topographic contours will not differ from the existing topographic configuration and are not shown. Lots, recreation centers, buildings, roads, open space, etc. are shown on the site plan.

20. All known wells (oil, water, unplugged, capped and/or abandoned, test holes, etc.):

There are 0 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply)

The wells are not in use and have been properly abandoned.

The wells are not in use and will be properly abandoned.

The wells are in use and comply with 16 TAC §76.

There are no wells or test holes of any kind known to exist on the project site.

21. Geologic or manmade features which are on the site:

All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

No sensitive geologic or manmade features were identified in the Geologic Assessment.

Attachment D - Exception to the Required Geologic Assessment. A request and justification for an exception to a portion of the Geologic Assessment is attached.

- 22.  The drainage patterns and approximate slopes anticipated after major grading activities.
- 23.  Areas of soil disturbance and areas which will not be disturbed.
- 24.  Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
- 25.  Locations where soil stabilization practices are expected to occur.
- 26.  Surface waters (including wetlands).
  - N/A
- 27.  Locations where stormwater discharges to surface water or sensitive features are to occur.
  - There will be no discharges to surface water or sensitive features.
- 28.  Legal boundaries of the site are shown.

### *Administrative Information*

- 29.  Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 30.  Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

WATER POLLUTION ABATEMENT PLAN APPLICATION FORM  
ATTACHMENT A

FACTORS AFFECTING SURFACE WATER QUALITY

DURING CONSTRUCTION

Non-Storm Water Discharges - The following non-storm water discharges may occur from the site during the construction period:

- Non-point discharge of paint and solvents
- Water used to wash vehicles or control dust
- Water from utility line flushing during initial line testing
- Petroleum drippings from vehicle movement
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred)
- Groundwater (from dewatering of excavation)
- Silt Runoff from soil disturbance
- Trash and Debris (Litter) and discarded Food and Tobacco Products

All non-storm water discharge will be directed to the Erosion and Sedimentation Controls (Best Management Practices) to remove any suspended solids contained therein. Material management practices will be utilized to reduce the risk of spills, or other accidental exposure of the materials listed above to storm water runoff. These and any other sources of pollutants that may affect storm water quality will be screened and filtered by temporary BMPs, which will be installed prior to the commencement of site clearing.

POST CONSTRUCTION

Non-Storm Water Discharges after construction has been completed which can affect water quality include:

- Lawn fertilizer and pesticides
- Petroleum drippings from vehicle movement
- Cleaning products used out-of-doors not captured in sanitary sewer
- Landscape Maintenance

Post-construction storm water discharges typically will transport sediment in the form of dirt and dust accumulated on streets and other impervious flatwork, rooftops and sediment from erosion of grassy areas. That material will be conveyed to the water quality pond (where most pollutants will be removed), and then conveyed to the proposed detention pond and finally discharge sheet flows into the undeveloped land.

WATER POLLUTION ABATEMENT PLAN APPLICATION FORM  
ATTACHMENT B

VOLUME AND CHARACTER OF STORMWATER

The project site is defined by one (1) offsite and one (1) onsite major existing drainage areas and drains mainly from southwest to northeast, onto the site and across the property. Using the City of Austin runoff coefficients, the existing drainage area will produce a peak flow of approximately 1288.84 cubic feet per second (cfs) during a 100-year storm event. Please refer to Existing Drainage Area Map provided in the site construction drawings for more information. This existing drainage area naturally conveys storm water off-site via overland flow, eventually discharging into the Onion Creek – Colorado River.

In proposed conditions, the total impervious cover on-site will be approximately 5.095 acres (+/- 9.31% of the total property acreage). Using the City of Austin runoff coefficients, the proposed drainage area will produce a peak flow of approximately 1280.26 cubic feet per second (cfs) during a 100-year storm event. Please refer to Existing and Proposed Drainage Area Map provided in the site construction drawings for more information. Please see the Project Narrative in General Information Section - Attachment C for more information.

Erosion Controls will be installed to decrease and/or prevent sediment runoff during construction. Please refer to the site construction drawings for further details.



WATER POLLUTION ABATEMENT PLAN APPLICATION FORM  
ATTACHMENT C

SUITABILITY LETTER FROM AUTHORIZED AGENT (OSSF)

OSSF SUITABILITY LETTER TO BE  
OBTAINED AND ADDED AT  
A LATER DATE



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V.

Temporary Stormwater Section  
(TCEQ-0602)

# Temporary Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

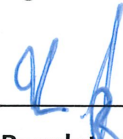
## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Temporary Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Henry Juarez

Date: 9/1/2022

Signature of Customer/Agent:



Regulated Entity Name: Carpenter Ranch RV Park

## Project Information

### Potential Sources of Contamination

*Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.*

1. Fuels for construction equipment and hazardous substances which will be used during construction:

The following fuels and/or hazardous substances will be stored on the site: \_\_\_\_\_

These fuels and/or hazardous substances will be stored in:

- Aboveground storage tanks with a cumulative storage capacity of less than 250 gallons will be stored on the site for less than one (1) year.

- Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- Fuels and hazardous substances will not be stored on the site.
- 2.  Attachment A - Spill Response Actions. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
- 3.  Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- 4.  Attachment B - Potential Sources of Contamination. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

### *Sequence of Construction*

- 5.  Attachment C - Sequence of Major Activities. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
  - For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
  - For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.
- 6.  Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Onion Creek-Colorado River

### *Temporary Best Management Practices (TBMPs)*

*Erosion control examples: tree protection, interceptor swales, level spreaders, outlet stabilization, blankets or matting, mulch, and sod. Sediment control examples: stabilized construction exit, silt fence, filter dikes, rock berms, buffer strips, sediment traps, and sediment basins. Please refer to the Technical Guidance Manual for guidelines and specifications. All structural BMPs must be shown on the site plan.*

- 7.  Attachment D – Temporary Best Management Practices and Measures. TBMPs and measures will prevent pollution of surface water, groundwater, and stormwater. The construction-phase BMPs for erosion and sediment controls have been designed to retain sediment on site to the extent practicable. The following information is attached:



- A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
  - A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
  - A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
  - A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.
8.  The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.
- Attachment E - Request to Temporarily Seal a Feature. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
  - There will be no temporary sealing of naturally-occurring sensitive features on the site.
9.  Attachment F - Structural Practices. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.
10.  Attachment G - Drainage Area Map. A drainage area map supporting the following requirements is attached:
- For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
  - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
  - For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
  - There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

- There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11.  Attachment H - Temporary Sediment Pond(s) Plans and Calculations. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
- N/A
12.  Attachment I - Inspection and Maintenance for BMPs. A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13.  All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14.  If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15.  Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16.  Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

### *Soil Stabilization Practices*

*Examples: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.*

17.  Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices. A schedule of the interim and permanent soil stabilization practices for the site is attached.

18.  Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.
19.  Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

### *Administrative Information*

20.  All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.
21.  If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.
22.  Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

TEMPORARY STORMWATER SECTION  
ATTACHMENT A

SPILL RESPONSE ACTIONS

Responsibility for adequate cleanup of any chemical spills during construction will be placed on the owner. All spill prevention actions and spill response/cleanup actions will be per Section 1.4.16 of TCEQ RG-348. The responsible person will notify TCEQ of any chemical spills as required and outlined in 30 TAC 327.4 and 40 CFR 302.4.

**General Measures**

1. To the extent that the work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
2. Store hazardous materials and wastes in covered containers and protect from vandalism.
3. Place a stockpile of spill cleanup materials where it will be readily accessible.
4. Train employees in spill prevention and cleanup.
5. Designate responsible individuals to oversee and enforce control measures.
6. Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise cleanup activities.
7. Do not bury or wash spills with water. 1-118
8. Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
9. Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
10. Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
11. Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
12. Keep waste storage areas clean, well-organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

**Cleanup**

1. Clean up leaks and spills immediately.
2. Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.
3. Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.



## **Minor Spills**

1. Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
2. Use absorbent materials on small spills rather than hosing down or burying the spill.
3. Absorbent materials should be promptly removed and disposed of properly.
4. Follow the practice below for a minor spill:
  - i) Contain the spread of the spill.
  - ii) Recover spilled materials.
  - iii) Clean the contaminated area and properly dispose of contaminated materials.

## **Semi-Significant Spills**

Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities.

Spills should be cleaned up immediately:

1. Contain spread of the spill.
2. Notify the project foreman immediately.
3. If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
4. If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
5. If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

## **Significant/Hazardous Spills**

For significant or hazardous spills that are in reportable quantities:

1. Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
2. For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
3. Notification should first be made by telephone and followed up with a written report.
4. The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
5. Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc. More information on spill rules and appropriate responses is available on the TCEQ website at: [http://www.tnrcc.state.tx.us/enforcement/emergency\\_response.html](http://www.tnrcc.state.tx.us/enforcement/emergency_response.html)

TEMPORARY STORMWATER SECTION  
ATTACHMENT B

POTENTIAL SOURCES OF CONTAMINATION

Some potential sources of contamination are as follows:

- fuel storage and use,
- chemical storage and use,
- use of asphaltic products,
- construction vehicles tracking onto public roads,
- existing solid waste,
- and other vehicular contaminants (i.e., fuel, oil, lubricants, etc.).

Refer to Attachment A for Spill Response Actions.

TEMPORARY STORMWATER SECTION  
ATTACHMENT C

SEQUENCE OF MAJOR ACTIVITIES

1. Construct temporary erosion control measures, including all silt fences, rock berms, diversion berms, and tree protection fencing per approved plan.
2. Conduct pre-construction conference with city inspector, water and wastewater utility representative, owner's representative, architect, engineer and contractor. Contact Hays County Development Services at (512) 393-2150 to schedule the pre-construction conference. An esc contact name and number will be provided to the city inspector for 24/7 access in the event of erosion and sediment control breach or related problem.
3. Construction Wet Pond, to act as temporary sedimentation basin.
4. Contractor shall contact Hays County prior to utility abandonment at (512) 393-2150, if appropriate.
5. Perform clearing, demolition and rough grading.
6. Install utilities. Conduct water and wastewater utility construction and testing for city acceptance. Coordinate underground electric, telephone, cable tv, and telecommunications construction. Install inlet protection.
7. Construct all weather access drives including asphalt, base, and curb & gutter.
8. Construct buildings.
9. Install all sidewalks.
10. Install streetscape and/or landscaping improvements.
11. Prior to city final acceptance, the contractor shall have vegetative cover in place in conformance with the general construction notes and landscape plan. All adjacent areas disturbed by the work will be repaired and revegetated by the general contractor to preexisting or better conditions. Permanent controls will be cleaned out and filter media will be installed prior to/concurrently with revegetation of site.
12. Schedule site final inspection with city environmental technician and city building inspector.
13. Remove any trapped sediment at erosion control devices and upon approval of city inspector. Remove all temporary erosion controls and tree protection.
14. The total overall disturbed area for Carpenter Ranch RV Park is approximately 54.7 acres.

TEMPORARY STORMWATER SECTION  
ATTACHMENT D

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

At the beginning of the project, Temporary Best Management Practices (BMPs) will be installed according to the Erosion and Sedimentation Notes and Details sheet and placed as shown on the Erosion and Sedimentation Control Plan sheet. Silt fences will be installed and the proposed detention pond and water quality pond will be rough cut before construction begins. When full, the proposed detention pond overflow will sheet flow downstream through silt fence. During construction, the silt fencing and detention pond are to be inspected weekly, and after any rainfall.

The site is located at 584 McKinnon Loop, Buda Texas 78610. Upgradient water from the undeveloped site upstream of the proposed development will be conveyed to the proposed detention pond.

**On-site Water**

Silt fencing will be placed downwards along the boundary line of the tracts. Inlet protection will be placed as necessary to protect the existing inlet onsite. These Temporary BMPs will be installed along the down-gradient boundary of the property to filter all runoff that originates on site. The temporary construction entrance will be installed to prevent tracking materials offsite. Additionally, a concrete truck washout area will be placed onsite and be accessible to all existing traffic leaving the site. By this, the Temporary BMPs will prevent pollution of surface water that originates on-site due to the construction of the project.

The following sections were taken from the TCEQ Manual, "Complying with Edward Aquifer Rules: Technical Guidance on Best Management Practices."

- Construction Exit should be used at all designated access points.
- Silt Fence (interior) Areas of minor sheet flow. < ¼ acre/100 feet of fence < 20% slopes.
- Silt Fence (exterior) Down slope borders of site; up slope border is necessary to divert offsite drainage. For larger areas use diversion swale or berm. < ¼ acre/100 feet of fence < 20% slopes.
- Rock Berm Drainage swales and ditches with and below site. < 5 acres < 30% slopes.
- Inlet Protection Prevent sediment from entering storm drain system. < 1 acre.
- Spill Prevention Used on all sites to reduce spills.
- Concrete Washout Use on all concrete pouring operations.



- A. A description of how BMPs and measures will prevent pollution of surface water, groundwater or storm water that originates upgradient from the site and flows across the site.
1. The upgradient storm water will be directed to the previously mentioned temporary BMPs.
- B. A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated storm water runoff from the site.
1. Silt fence and stabilized construction entrances shall be used to prevent pollution of surface water, groundwater or storm water that originates on-site or flows off-site by locating the TBMPs downstream of the flows leaving the site. The TBMPs will reduce the amount of contaminated runoff leaving the site by acting as a filter for sediment before the flows are released into the existing storm sewer system. Also included is a stabilized construction entrance to reduce the amount of mud tracked onto surrounding streets by construction vehicles. Inspection and maintenance of the on-site controls shall be performed during the site clearing and rough grading process.
- All TBMPs will be maintained by the Contractor as will be described in the Contractor's Storm water Pollution Prevention Plan (SWPPP). The initial installation of Erosion and Sedimentation Controls, will act as a sediment trap, and help to prevent pollution of surface waters from runoff originating on-site to the greatest extent practicable.
- C. A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
1. By locating the TBMPs downstream of the flows leaving the site, the TBMPs will reduce the amount of contaminated runoff leaving the site by acting as a filter for sediment before the flows are released. Also included is a stabilized construction entrance to reduce the amount of mud tracked onto surrounding streets by construction vehicles. Inspection and maintenance of the on-site controls shall be performed during the site clearing and rough grading process. All TBMPs will be maintained by the Contractor as will be described in the Contractor's SWPPP. The initial installation of Erosion and Sedimentation Controls, will act as a sediment trap, and help to prevent pollution of surface waters from runoff originating onsite to the greatest extent practicable.
- D. A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

Please refer to Erosion and Sedimentation Control Plan within the Carpenter Ranch RV Park Construction Plans.

TEMPORARY STORMWATER SECTION  
ATTACHMENT E

REQUEST TO TEMPORARILY SEAL A FEATURE

There will be no temporary sealing of naturally-occurring sensitive features on the site.

TEMPORARY STORMWATER SECTION  
ATTACHMENT F

STRUCTURAL PRACTICES

Structural practices will be used to limit runoff discharge of pollutants from exposed areas of the site. Silt fencing, triangular sediment filter dikes, inlet protection devices, and stabilized construction entrances will be incorporated as temporary erosion control devices and will be removed after the permanent stabilization is established.

Silt fencing shall be incorporated throughout the construction process. The placement of the silt fencing shall be perpendicular to runoff flow. Refer to project construction documents for quantity and actual locations of these erosion control devices. In areas where silt fencing is to be situated but is non-installable, triangular filter dikes shall be incorporated.

Stabilized construction entrances will be employed during the construction of this site to help minimize vehicle tracking of sediments. Paved streets adjacent to these site entrances shall be cleaned and/or swept regularly to remove any excess mud, dirt or rock tracked from the site. Refer to the project construction documents for actual locations of these erosion control devices. Staging areas will be utilized in locations as decided by the project general contractor and validated by the civil engineer. If the contractor determines the need for additional stabilized construction entrances, construction staging areas or pits, their locations shall be agreed upon by the contractor and the engineer and annotated in the Storm Water Pollution Prevention Plan (SWPPP) posted on the site during construction.

TEMPORARY STORMWATER SECTION  
ATTACHMENT G

DRAINAGE AREA MAP

Please see the Construction Plans provided with this application for Existing and Proposed Drainage Area Maps, as well as details on the proposed methods for temporary erosion and sedimentation controls for the disturbed areas.

TEMPORARY STORMWATER SECTION  
ATTACHMENT H

TEMPORARY SEDIMENT POND(S) PLANS AND CALCULATIONS

This section is not applicable for this project.



TEMPORARY STORMWATER SECTION  
ATTACHMENT I

INSPECTION AND MAINTENANCE FOR BMPS

**INSPECTIONS**

Each contractor will designate a qualified person (or persons) to perform the following inspections:

1. Disturbed areas and areas used for storage of materials that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system.
2. Erosion and sediment control measures identified in the plan will be observed to ensure that they are operating correctly.
3. Where discharge locations or points are accessible, they will be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.
4. Locations where vehicles enter or exit the site will be inspected for evidence of offsite sediment tracking.

The inspection shall be conducted by the responsible person at least once every seven (7) calendar days and within 24 hours after a storm providing 1/2 inches of rainfall or greater. If one or more of the following conditions apply, the frequency of inspections shall be conducted at least once every month:

1. The site has been temporarily stabilized.
2. Where runoff is unlikely due to winter conditions (i.e. site is covered with snow, ice, or where frozen ground exists).
3. During seasonal arid periods in arid areas (areas with an average annual rainfall of 0 to 10 inches) and semi-arid areas (areas with an average annual rainfall of 10 to 20 inches).

The information required within an inspection and maintenance report are as follows:

1. Summary of the scope of the inspection.
2. Name(s) and qualifications of personnel making the inspection.
3. The date(s) of the inspection.
4. Major observations relating to the implementation of the storm water pollution prevention plan.

5. Changes required to correct damages or deficiencies in the control measures.

In addition to the required routine inspections, the following record of information will also be maintained:

1. The dates when selective clearing activities occur.
2. The dates when selective clearing activities permanently cease on a portion of the site.

Inspection and maintenance reports, as well as all records required by a Storm Water Pollution Prevention Plan (SWPPP), shall be included in the onsite SWPPP as part of the Texas Pollution Discharge Elimination System (TPDES) Report. Copies of example forms to be used for the inspection and maintenance reports along with their related records, will be included in the onsite SWPPP and are provided for reference.

## **MAINTENANCE**

Based on the results of the inspection, any changes required to correct damages or deficiencies in the control measures shall be made within seven (7) calendar days after the inspection. If existing erosion controls need modification or additional erosion controls are necessary, implementation shall be achieved prior to the next anticipated storm event. If, however, the execution of this requirement becomes impractical, then the implementation will occur as soon as possible, with the incident duly noted with an explanation of the impracticality, in the inspection report.

Sediment accumulation at each control will be removed and properly disposed when the depth of accumulation equals or exceeds six (6) inches. If sediment accumulation is found to be contaminated, its disposal shall be off-site in a manner which conforms to the appropriate applicable regulations.

CARPENTER RANCH RV PARK  
 MCKINNIN LOOP  
 BUDA, TX 78610

Inspection Report

Prevention Measure	Pollution	Inspected in Compliance (Y/N)	Corrective Action Required	
			Description (use additional sheet if necessary)	Date Completed
<b>BEST MANAGEMENT PRACTICES</b>				
Silt fences				
Rock berms				
Drain inlet protection				
Gravel filter bags				
Vehicle exits (offsite tracking)				
Concrete washout pit (leaks, failure)				
Temporary vegetation				
Permanent vegetation				
Sediment control basin				
Other structural controls				
Material storage areas (leakage)				
Equipment areas (leaks, spills)				
Construction debris				
General site cleanliness				
Trash receptacles				
Natural vegetation buffer strips				
<b>EVIDENCE OF EROSION</b>				
Site preparation				
Roadway or Parking Lot Construction				
Utility Construction				
Drainage Construction				
Building Construction				
<b>MAJOR OBSERVATIONS</b>				
Sediment discharges from site				
BMPs requiring maintenance				
BMPs requiring modification				
Additional BMPs required				

"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 that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

\_\_\_\_\_  
 Inspector's Name (Superintendent)

\_\_\_\_\_  
 Inspector's Signature

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Name of Owner/Operator (Firm)

\_\_\_\_\_  
 Authorized Signature

\_\_\_\_\_  
 Date

Note: If there is a "NO" answer in the second column, the right columns will need to be completed and action is required within 7 days. Use additional sheets if necessary.

CARPENTER RANCH RV PARK  
MCKINNON LOOP  
BUDA, TX 78610

Responsible Party Form and Schedule

Prevention Measure	Pollution	Responsible Party Company Name									
		Start Date	Estimated Duration (Days)								
<b>BEST MANAGEMENT PRACTICES</b>											
Silt fences											
Rock berms											
Drain inlet protection											
Gravel filter bags											
Vehicle exits (offsite tracking)											
Concrete washout pit (leaks, failure)											
Temporary vegetation											
Permanent vegetation											
Sediment control basin											
Other structural controls											
Material storage areas (leakage)											
Equipment areas (leaks, spills)											
Construction debris											
General site cleanliness											
Trash receptacles											
Natural vegetation buffer strips											
Inspections											
SWP3 Modification & Records											
<b>POTENTIAL EROSION SOURCES</b>											
Clearing											
Grading											
Excavation											
Drainage Construction											
Utility Construction											
Roadway or Parking Lot Construction											
Foundation Construction											
Building Construction											
Landscaping Activities											
Identify responsible parties and indicate responsible party for each pollution prevention item listed above by marking an X under the Responsible Party Name.											

TEMPORARY STORMWATER SECTION  
ATTACHMENT J

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

**During Construction:**

The methodology for handling pollution of on-site or up-gradient storm water during construction will include the following:

1. Silt fencing and rock berms will be used as a temporary erosion and sedimentation controls.
2. Stabilized construction entrances/exits will be put into place to reduce the dispersion of sediment from the site, and to aid in accessibility to the site.
3. A construction staging area will also be put into place for material stockpiles, machinery storage, and machinery maintenance.
4. Concrete truck washout pits will be put into place to prevent contamination of storm water runoff and to aid in the removal of sediments from the site.
5. As required by the TCEQ General Permit, disturbed areas on which construction activity has ceased (temporarily or permanently) and which will be exposed for more than 21 days shall be stabilized within 14 days. Areas receiving less than 20 inches of annual rainfall should be stabilized as soon as practicable and only to pre-project conditions.
6. If construction stops for more than 14 days, hydro-seeding, sod or other TCEQ approved method will be applied to re-stabilize vegetation.

**After Construction:**

This site will provide the following permanent pollution abatement measures to prevent the pollution of storm water originating on-site or upgradient from the project site:

1. Storm water will be directed to grate inlets via curbing and grading and discharged into the sedimentation/filtration basins. The sedimentation/filtration basins have been designed to capture and filter the required runoff from the individual watersheds. The basin has been designed in accordance with the TCEQ Technical Guidance Manual. Each basin will be constructed as that particular phase is built.



2. Native grasses will be used on-site to help reduce the use of fertilizers and this will in turn reduce the levels of phosphates present in the storm water runoff.
3. Where possible drainage will be directed across vegetated areas to provide some pretreatment prior to discharge into the filtration basin.

**Permanent Erosion Control:**

1. All disturbed areas shall be restored as noted below:
  - A minimum of 4" of topsoil shall be placed in all drainage channels (except rock) and between the curb and R.O.W. property lines.
2. Broadcast Seeding:
  - From September 15 to March 1, seeding shall be with a combination of 2 pounds per 1,000 SF of unhulled Bermuda and 7 pounds per 1000 SF of Winter Rye with a purity of 95% with 90% germination.
  - From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of 2 pounds per 1000 SF with a purity of 95% with 85% germination.
3. Fertilizer shall be a pelleted or granular slow release with an analysis of 15-15-15 to be applied once at planting and once during the period of establishment at a rate of 1 pound per 1,000 SF.

**Seeding:**

- 1) The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:
  - a) From September 15 to March 1, seeding shall be with a combination of 2 pounds per 1,000 square feet of unhulled Bermuda and 7 pounds per 1,000 square feet of Winter rye with a purity of 95% with 90% germination.
  - b) From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of 3 pounds per 1,000 square feet with a purity of 95% with 85% germination.
- 2) Fertilizer shall be slow release granular or pelleted type and shall have an analysis of 15-15-15 and shall be applied at the rate of 23 pounds per acre, once at the time of planting and again once during the time of establishment.
- 3) The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil but will sufficiently soak the soil to a depth of six inches. The irrigation shall occur at ten-day intervals during the first two months. Rainfall

occurrences of an inch or more shall postpone the watering schedule for one week.

- 4) Mulch type used shall be Prairie hay, applied at a rate of 4,000 pounds per acre.
- 5) Restoration shall be acceptable when the grass has grown at least one inch high with 70% coverage, provided no bare spots larger than 18 square feet exist.



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**Civil | Environmental | Land Development**

**HEADQUARTERS**  
307 Saint Lawrence St.  
Gonzales, TX 78629  
Phone: 830.672.7546

**CENTRAL TEXAS OFFICE**  
205 Cimarron Park Loop, Ste B  
Buda, TX 78610  
Phone: 512.312.4336

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## VI.

### Permanent Stormwater Section (TCEQ-0600)

# Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(ii), (E), and (5), Effective June 1, 1999

*To ensure that the application is administratively complete, confirm that all fields in the form are complete, verify that all requested information is provided, consistently reference the same site and contact person in all forms in the application, and ensure forms are signed by the appropriate party.*

*Note: Including all the information requested in the form and attachments contributes to more streamlined technical reviews.*

## Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Permanent Stormwater Section** is hereby submitted for TCEQ review and executive director approval. The application was prepared by:

Print Name of Customer/Agent: Henry Juarez

Date: 9/1/2022

Signature of Customer/Agent



Regulated Entity Name: Carpenter Ranch RV Park

## Permanent Best Management Practices (BMPs)

*Permanent best management practices and measures that will be used during and after construction is completed.*

- Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.  
 N/A
- These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.  
 The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

- A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: \_\_\_\_\_
- N/A
3.  Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.
- N/A
4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- The site will be used for low density single-family residential development and has 20% or less impervious cover.
- The site will be used for low density single-family residential development but has more than 20% impervious cover.
- The site will not be used for low density single-family residential development.
5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- Attachment A - 20% or Less Impervious Cover Waiver. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
- The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
- The site will not be used for multi-family residential developments, schools, or small business sites.
6.  Attachment B - BMPs for Upgradient Stormwater.



- A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
  - No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
  - Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.
7.  Attachment C - BMPs for On-site Stormwater.
- A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
  - Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.
8.  Attachment D - BMPs for Surface Streams. A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.
- N/A
9.  The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.
- The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
  - Attachment E - Request to Seal Features. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.
10.  Attachment F - Construction Plans. All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:
- Design calculations (TSS removal calculations)
  - TCEQ construction notes
  - All geologic features
  - All proposed structural BMP(s) plans and specifications
- N/A

11.  Attachment G - Inspection, Maintenance, Repair and Retrofit Plan. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
- Prepared and certified by the engineer designing the permanent BMPs and measures
  - Signed by the owner or responsible party
  - Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
  - A discussion of record keeping procedures
- N/A
12.  Attachment H - Pilot-Scale Field Testing Plan. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
- N/A
13.  Attachment I - Measures for Minimizing Surface Stream Contamination. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
- N/A

### *Responsibility for Maintenance of Permanent BMP(s)*

*Responsibility for maintenance of best management practices and measures after construction is complete.*

14.  The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
- N/A
15.  A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
- N/A

PERMANENT STORMWATER SECTION  
ATTACHMENT A

20% OR LESS IMPERVIOUS COVER WAIVER

This Attachment is not applicable. Please refer to the site construction drawings provided with this application for information concerning the proposed permanent Best Management Practices (BMP's) on-site.

PERMANENT STORMWATER SECTION  
ATTACHMENT B

BMPS FOR UPGRADIENT STORMWATER

No BMP's are required for upgradient stormwater runoff. Please refer to the site construction drawings for more information.

PERMANENT STORMWATER SECTION  
ATTACHMENT C

BMPS FOR ON-SITE STORMWATER

Permanent Best Management Practices (BMPs) are proposed to prevent pollution of surface water that originates on-site, including pollution that originates from contaminated storm water runoff from the site. The BMPs will be in the form of a Wet Pond designed to capture and treat storm water runoff produced off-site and on-site. Please refer to the site construction drawings for detailed calculations and more information.



PERMANENT STORMWATER SECTION  
ATTACHMENT D

BMPS FOR SURFACE STREAMS

No BMP's are required for upgradient stormwater runoff. Please refer to the site construction drawings for more information.

PERMANENT STORMWATER SECTION  
ATTACHMENT E

REQUEST TO SEAL FEATURES

This section is not applicable for this project.

PERMANENT STORMWATER SECTION  
ATTACHMENT F

CONSTRUCTION PLANS

Please refer to the Carpenter Ranch RV Park Construction Plans provided with this application.

**PERMANENT STORMWATER SECTION ATTACHMENT G:  
INSPECTION SCHEDULE AND MAINTENANCE PLAN  
PERMANENT BEST MANAGEMENT PRACTICE**

**PROJECT NAME:** CARPENTER RANCH RV PARK  
**ADDRESS:** McKINNON LOOP  
**CITY, STATE ZIP:** HAYS, TX 78610

Batch Detention Pond:

A clear requirement for Batch Detention Pond BMP is that a firm commitment be made to carry out both routine and non-routine maintenance tasks. The nature of the maintenance requirements are outlined below, along with design tips that can help to reduce the maintenance burden (modified from Young et al., 1996).

Routine Maintenance.

*Mowing.* The side-slopes, embankment, and emergency spillway of the basin should be mowed at least twice a year to prevent woody growth and control weeds.

*Inspections.* Partial Sedimentation/Filtration Basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the basin is functioning properly. There are many functions and characteristics of these BMPs that should be inspected. The embankment should be checked for subsidence, erosion, leakage, cracking, and tree growth. The condition of the emergency spillway should be checked. The inlet, barrel, and outlet should be inspected for clogging. The adequacy of upstream and downstream channel erosion protection measures should be checked. Stability of the side slopes should be checked. Modifications to the basin structure and contributing watershed should be evaluated. During semi-annual inspections, replace any dead or displaced vegetation. Replanting of various species of wetland vegetation may be required at first, until a viable mix of species is established. Cracks, voids and undermining should be patched/filled to prevent additional structural damage. Trees and root systems should be removed to prevent growth in cracks and joints that can cause structural damage. The inspections should be carried out with as-built pond plans in hand.

*Debris and Litter Removal.* As part of periodic mowing operations and inspections, debris and litter should be removed from the surface of the pond. Particular attention should be paid to floatable debris around the riser, and the outlet should be checked for possible clogging.

*Erosion Control.* The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion. Corrective measures such as regrading and revegetation may be necessary. Similarly, the riprap protecting the channel near the outlet may need to be repaired or replaced.

3-97

*Nuisance Control.* Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.). Biological control of algae and mosquitoes using fish such as fathead minnows is preferable to chemical applications.

Non-routine maintenance.

*Structural Repairs and Replacement.* Eventually, the various inlet/outlet and riser works in the Partial Sedimentation/Filtration Basins will deteriorate and must be replaced. Some public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, while concrete barrels and risers may last from 50 to 75 yr. The actual life depends on the type of soil, pH of runoff, and other factors. Polyvinyl chloride (PVC) pipe is a corrosion resistant alternative to metal and concrete pipes. Local experience typically determines which materials are best suited to the site conditions. Leakage or seepage of water through the embankment can be avoided if the embankment has been constructed of impermeable material, has been compacted, and if anti-seep collars are used around the barrel. Correction of any of these design flaws is difficult.

*Sediment Removal* Batch Detention Pond will eventually accumulate enough sediment to significantly reduce storage capacity of the Pond. As might be expected, the accumulated sediment can reduce both the appearance and pollutant removal performance of the pond. Sediment accumulated in the Pond should be removed from the facility every two years to prevent accumulation in the Batch Detention Pond.

*Harvesting.* If vegetation is present on the fringes or in the pond, it can be periodically harvested and the clippings removed to provide export of nutrients and to prevent the basin from filling with decaying organic matter.

Accumulated silt shall be properly disposed. Refer to Texas Natural Resource Conservation Commission (TNRCC) and the local government entity guidelines and specifications.

The responsible party understands that following any amendment(s) to the previously described inspection schedule and maintenance plan, a signed copy of the revised document will be submitted to the appropriate regional office of Texas



Natural Resource Conservation Commission within thirty (30) days for review and approval. Also, if there are any changes in the following information, a revised copy of this document will be submitted to appropriate regional office within 30 days.

Documenting Inspections: Inspection, maintenance, repairs, and retrofits performed per the above requirements must be documented and records thereof maintained with the WPAP.

The following format may be used to document the required maintenance:

**Facility Name:** CARPENTER RANCH RV PARK

**Date of Inspection:** \_\_\_\_\_

**Reason of Inspection/Action:** \_\_\_\_\_  
(Monthly, Quarterly, Yearly, Rainfall, Other)

**Batch Detention Pond Conditions:** \_\_\_\_\_

**Detailed Description of Actions Taken:** \_\_\_\_\_

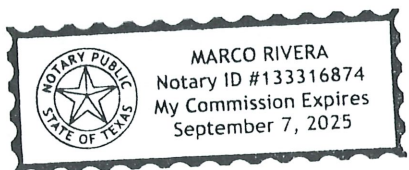
The responsible party understands that following any amendment(s) to the previously described inspection schedule and maintenance plan, a signed copy of the revised document will be submitted to the appropriate regional office of Texas Natural Resource Conservation Commission within thirty (30) days for review and approval. Also, if there are any changes in the following information, a revised copy of this document will be submitted to appropriate regional office within 30 days.

Responsible Party:	<u>James Stinson</u>
	(Name Typed)
Entity:	<u>Austin NNN, LLC</u>
Mailing Address:	<u>7811 Manchaca Road</u>
City, State:	<u>Austin, TX</u> Zip: <u>78745</u>
Telephone:	<u>512-221-0780</u>
Fax:	_____

[Signature]  
Signature of Responsible Party

Aug 10, 2022  
Date

State of Texas  
County of Travis  
This instrument was acknowledged  
before me on 08/10/2022  
by JAMES STINSON  
NOTARY [Signature]



PERMANENT STORMWATER SECTION  
ATTACHMENT H

PILOT SCALE FIELD TESTING PLAN

This section is not applicable for this project.

PERMANENT STORMWATER SECTION  
ATTACHMENT I

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

The proposed improvements are not expected to change the way in which stormwater runoff enters nearby streams or affects stream flashing, in-stream velocities, and other in-stream effects.



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**Civil | Environmental | Land Development**

**HEADQUARTERS**  
307 Saint Lawrence St.  
Gonzales, TX 78629  
Phone: 830.672.7546

**CENTRAL TEXAS OFFICE**  
205 Cimarron Park Loop, Ste B  
Buda, TX 78610  
Phone: 512.312.4336

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## VII.

### Agent Authorization Form (TCEQ-0599)



**Agent Authorization Form**  
For Required Signature  
Edwards Aquifer Protection Program  
Relating to 30 TAC Chapter 213  
Effective June 1, 1999

I \_\_\_\_\_ James Stinson \_\_\_\_\_,  
Print Name

\_\_\_\_\_ President/Owner \_\_\_\_\_,  
Title - Owner/President/Other

of \_\_\_\_\_ Carpenter Road Ranch LLC \_\_\_\_\_,  
Corporation/Partnership/Entity Name

have authorized \_\_\_\_\_ Henry Juarez/ Matthew A. Dringenberg, P.E. \_\_\_\_\_  
Print Name of Agent/Engineer

of \_\_\_\_\_ Southwest Engineers, Inc. \_\_\_\_\_  
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to \$10,000 per day per violation.
2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.
3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.
4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.
5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

*[Handwritten Signature]*

Applicant's Signature

August 10th 2022.  
Date

THE STATE OF Texas

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared James Stinson known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

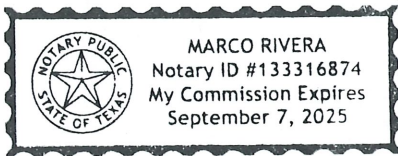
GIVEN under my hand and seal of office on this 10 day of August 2022.

*[Handwritten Signature]*

NOTARY PUBLIC

Marco Rivera

Typed or Printed Name of Notary



MY COMMISSION EXPIRES: 09/07/2025



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**Civil | Environmental | Land Development**

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**CENTRAL TEXAS OFFICE**  
205 Cimarron Park Loop, Ste B  
Buda, TX 78610  
Phone: 512.312.4336

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## VIII.

# Application Fee Form (TCEQ-0574)

# Application Fee Form

## Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Carpenter Ranch RV Park

Regulated Entity Location: McKinnon Loop, Buda, TX 78610

Name of Customer: Austin NNN, LLC

Contact Person: Henry Juarez

Phone: 512-312-4336

Customer Reference Number (if issued): CN \_\_\_\_\_

Regulated Entity Reference Number (if issued): RN \_\_\_\_\_

### Austin Regional Office (3373)

Hays

Travis

Williamson

### San Antonio Regional Office (3362)

Bexar

Medina

Uvalde

Comal

Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to:

Austin Regional Office

San Antonio Regional Office

Mailed to: TCEQ - Cashier

Overnight Delivery to: TCEQ - Cashier

Revenues Section

12100 Park 35 Circle

Mail Code 214

Building A, 3rd Floor

P.O. Box 13088

Austin, TX 78753

Austin, TX 78711-3088

(512)239-0357

### Site Location (Check All That Apply):

Recharge Zone

Contributing Zone

Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	54.7 Acres	\$ 8,000
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: 

Date: 1/13/2023



# Application Fee Schedule

Texas Commission on Environmental Quality  
 Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

## *Water Pollution Abatement Plans and Modifications*

### *Contributing Zone Plans and Modifications*

<i>Project</i>	<i>Project Area in Acres</i>	<i>Fee</i>
One Single Family Residential Dwelling	< 5	\$650
Multiple Single Family Residential and Parks	< 5	\$1,500
	5 < 10	\$3,000
	10 < 40	\$4,000
	40 < 100	\$6,500
	100 < 500	\$8,000
	≥ 500	\$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	\$3,000
	1 < 5	\$4,000
	5 < 10	\$5,000
	10 < 40	\$6,500
	40 < 100	\$8,000
	≥ 100	\$10,000

### *Organized Sewage Collection Systems and Modifications*

<i>Project</i>	<i>Cost per Linear Foot</i>	<i>Minimum Fee- Maximum Fee</i>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

### *Underground and Aboveground Storage Tank System Facility Plans and Modifications*

<i>Project</i>	<i>Cost per Tank or Piping System</i>	<i>Minimum Fee- Maximum Fee</i>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

### *Exception Requests*

<i>Project</i>	<i>Fee</i>
Exception Request	\$500

### *Extension of Time Requests*

<i>Project</i>	<i>Fee</i>
Extension of Time Request	\$150



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**Civil | Environmental | Land Development**

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Phone: 830.672.7546

**CENTRAL TEXAS OFFICE**  
205 Cimarron Park Loop, Ste B  
Buda, TX 78610  
Phone: 512.312.4336

---

## IX.

Check Payable to the "Texas Commission on Environmental Quality"



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**Civil | Environmental | Land Development**

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Gonzales, TX 78629  
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**CENTRAL TEXAS OFFICE**  
205 Cimarron Park Loop, Ste B  
Buda, TX 78610  
Phone: 512.312.4336

---

X.

Core Data Form  
(TCEQ-10400)



TCEQ Use Only

# TCEQ Core Data Form

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.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
2. Customer Reference Number (if issued)	<a href="#">Follow this link to search for CN or RN numbers in Central Registry**</a>	3. Regulated Entity Reference Number (if issued)
CN		RN

## SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)		
<input checked="" type="checkbox"/> New Customer <input type="checkbox"/> Update to Customer Information <input type="checkbox"/> Change in Regulated Entity Ownership <input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)			
<i>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).</i>			
6. Customer Legal Name (If an individual, print last name first: eg: Doe, John)		<i>If new Customer, enter previous Customer below:</i>	
Carpenter Road Ranch 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)
0803777345	32076095655		
11. Type of Customer:	<input checked="" type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship	<input type="checkbox"/> Other:	
12. Number of Employees		13. Independently Owned and Operated?	
<input type="checkbox"/> 0-20 <input checked="" type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
14. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following			
<input checked="" type="checkbox"/> Owner <input type="checkbox"/> Operator <input checked="" type="checkbox"/> Owner & Operator <input type="checkbox"/> Occupational Licensee <input type="checkbox"/> Responsible Party <input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:			
15. Mailing Address:	10417 Tularosa Pass		
	City	Austin	State TX ZIP 78726 ZIP + 4 2465
16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable)	
		centexhuntclub@gmail.com	
18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)	
( 512 ) 221-0780		( ) -	

## 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)	
<input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information	
<i>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).</i>	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
Carpenter Ranch RV Park	



23. Street Address of the Regulated Entity: <i>(No PO Boxes)</i>	584 McKinnon Loop							
	City	Buda	State	TX	ZIP	78610	ZIP + 4	
24. County	Hays							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	Legal Description: A0012 A0012 - John G Mcgehee Survey, ACRES 54.78								
26. Nearest City	Buda				State	TX	Nearest ZIP Code		78610
27. Latitude (N) In Decimal:	30.126328			28. Longitude (W) In Decimal:	-97.880726				
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
30	7	35	-97	52	51				
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)				
7033		721211							
33. What is the Primary Business of this entity? <i>(Do not repeat the SIC or NAICS description.)</i>									
RV Park									
34. Mailing Address:	7811 Menchaca Rd								
	City	Austin	State	TX	ZIP	78745	ZIP + 4	6943	
35. E-Mail Address:	centexhuntclub@gmail.com								
36. Telephone Number	37. Extension or Code			38. Fax Number <i>(if applicable)</i>					
( 512 ) 221-780				( ) -					

**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.

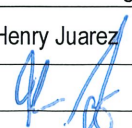
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input checked="" type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

**SECTION IV: Preparer Information**

40. Name:	Henry Juarez	41. Title:	Project Manager
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
( 512 ) 312-4336		( ) -	henry.juarez@swengineers.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:	Southwest Engineers, Inc.	Job Title:	Project Manager
Name <i>(In Print)</i> :	Henry Juarez	Phone:	( 512 ) 312- 4436
Signature:		Date:	1/13/2023



# Southwest Engineers

Civil | Environmental | Land Development

## **SOUTHWEST ENGINEERS, INC**

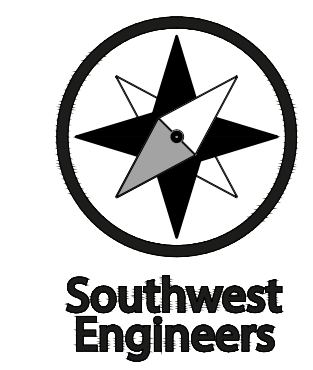
205 CIMARRON PARK LOOP, SUITE B

BUDA, TX 78610

P: 512.312.4336 | F: 830.672.2034

[www.swengineers.com](http://www.swengineers.com) | TBPE NO. F-1909





CARPENTER RANCH RV PARK

# CONSTRUCTION PLANS FOR CARPENTER RANCH RV PARK

584 MCKINNON LOOP  
BUDA, HAYS COUNTY, TEXAS 78610

OCTOBER 2022

SWE PROJECT # 0946-001

**CIVIL ENGINEER**  
MATTHEW A. DRINGENBERG (SOUTHWEST ENGINEERS)  
205 CIMARRON PARK LOOP, SUITE B  
BUDA, TX 78610  
PHONE: (512) 312-4336  
EMAIL: MATT.DRINGENBERG@SWENGINEERS.COM

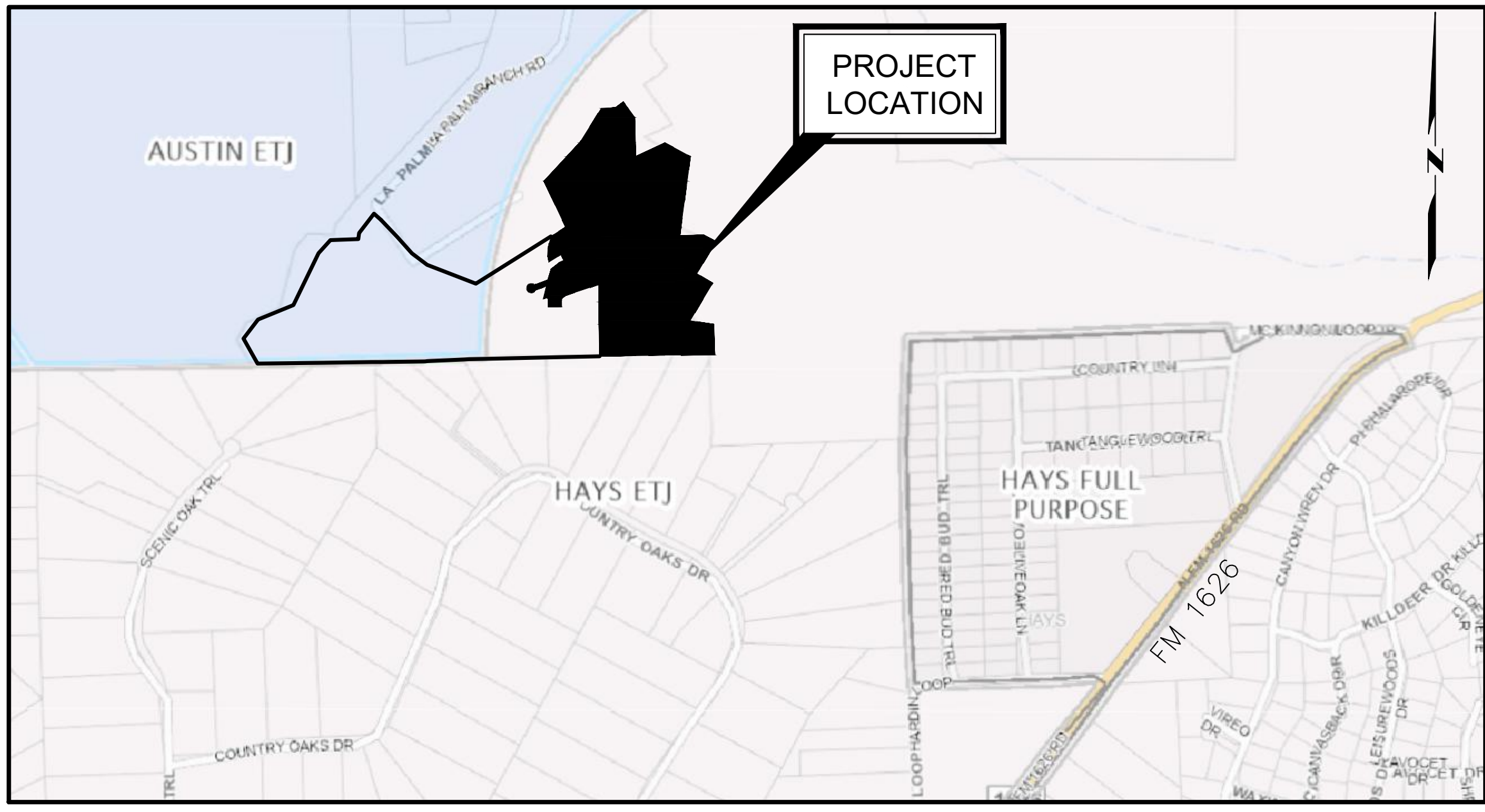
**OWNER/DEVELOPER INFORMATION**  
JAMES STINSON  
7811 MANCHACA ROAD  
AUSTIN, TX 78745

**SURVEYOR INFORMATION**  
ALBERT UECKER CONSULTING, LLC  
340 HIDDEN OAKS  
BULVERDE, TX 78163  
ALBERT UECKER, R.P.L.S. 5888  
210-602-4238

**FLOODPLAIN STATUS**  
NO PORTION OF THIS ±55 ACRE TRACT IS WITHIN THE 100 YEAR FLOODPLAIN PER THE FEDERAL FLOOD INSURANCE ADMINISTRATION FIRM MAP NO. 48209C0145F, 48209C0260F DATED SEPTEMBER 2, 2005

**EDWARDS AQUIFER**  
THE ENTIRETY OF THIS TRACT IS LOCATED WITHIN THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) EDWARDS AQUIFER RECHARGE ZONE.

- GENERAL NOTES:**
- BY THE ACT OF SUBMITTING A BID FOR THE PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS AND SPECIFICATIONS AND OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED. THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS AND MATERIAL SUPPLIERS KNOWLEDGE ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.
  - THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAS BEEN BASED UPON RECORD INFORMATION ONLY AND MAY NOT MATCH LOCATIONS AS CONSTRUCTED. THE CONTRACTOR SHALL CONTACT THE TEXAS AREA "ONE CALL" SYSTEM @ 811 OR 1-800-545-6005, OR THE OWNER OF EACH INDIVIDUAL UTILITY, FOR ASSISTANCE IN DETERMINING EXISTING UTILITY LOCATIONS PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF UTILITY CROSSING PRIOR TO BEGINNING CONSTRUCTION.
  - ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION. (OSHA STANDARDS MAY BE PURCHASED FROM THE GOVERNMENT PRINTING OFFICE, INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA.
  - CONTRACTOR SHALL RESTORE ALL SIGNS AND PAVEMENT MARKINGS TO EXISTING CONDITIONS FOLLOWING THE COMPLETION OF EACH PHASE OF CONSTRUCTION. CONTRACTORS SHALL REFER TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD) FOR SIGN AND MARKING DIMENSIONS AND COLORS.
  - THE USE OF COAL-TAR BASED SEALANTS FOR THE CONSTRUCTION OR REPAIR OF ASPHALTIC CONCRETE PAVING ON THE PROPERTY IS PROHIBITED.
  - ALL CONSTRUCTION HEREIN SHALL BE PERFORMED IN ACCORDANCE WITH CITY OF BUDA STANDARD SPECIFICATIONS, UNLESS OTHERWISE NOTED. NO SEPARATE SPECIFICATIONS WILL BE PROVIDED.
  - CONTRACTOR IS FULLY RESPONSIBLE FOR FIELD LOCATING ALL EXISTING UTILITIES, PRIVATE AND PUBLIC, WITHIN WORK AREA. NEITHER OWNER NOR ENGINEER HAS AS-BUILT INFORMATION FOR UNDERGROUND UTILITIES AND MAKES NO GUARANTEE AS TO THEIR LOCATION. CONTRACTOR WILL EMPLOY CONSTRUCTION METHODS NECESSARY TO ENSURE UNDERGROUND UTILITIES ARE NOT DAMAGED (IE. HAND DIGGING ETC.)
- THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES TO EXISTING UTILITIES, PRIVATE OR PUBLIC, AND SHALL REPAIR ANY UTILITIES DAMAGED TO THE OWNER'S SPECIFICATIONS AT NO COST TO THE OWNER.



VICINITY MAP  
N.T.S.

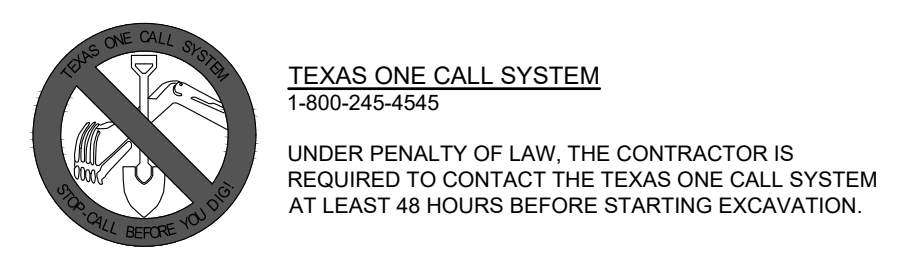
Sheet List Table	
Sheet Number	Sheet Title
1	COVER SHEET
2	NOTES SHEET
3	EXISTING CONDITIONS SHEET
4	EROSION & SEDIMENTATION CONTROL PLAN (1 OF 5)
5	EROSION & SEDIMENTATION CONTROL PLAN (2 OF 5)
6	EROSION & SEDIMENTATION CONTROL PLAN (3 OF 5)
7	EROSION & SEDIMENTATION CONTROL PLAN (4 OF 5)
8	EROSION & SEDIMENTATION CONTROL PLAN (5 OF 5)
9	EXISTING DRAINAGE AREA MAP
10	PROPOSED DRAINAGE AREA MAP
11	CULVERT AND CHANNEL DRAINAGE AREA MAP
12	CULVERT PROFILES
13	CHANNEL PROFILES
14	OVERALL SITE PLAN
15	SITE AND DIMENSION CONTROL PLAN (1 OF 5)
16	SITE AND DIMENSION CONTROL PLAN (2 OF 5)
17	SITE AND DIMENSION CONTROL PLAN (3 OF 5)
18	SITE AND DIMENSION CONTROL PLAN (4 OF 5)
19	SITE AND DIMENSION CONTROL PLAN (5 OF 5)
20	GRADING PLAN (1 OF 5)
21	GRADING PLAN (2 OF 5)
22	GRADING PLAN (3 OF 5)
23	GRADING PLAN (4 OF 5)
24	GRADING PLAN (5 OF 5)
25	WET POND PLAN
26	WET POND CROSS SECTIONS
27	OUTFALL STRUCTURE CROSS SECTIONS AND DETAILS SHEET
28	WATER SHEET (1 OF 4)
29	WATER SHEET (2 OF 4)
30	WATER SHEET (3 OF 4)
31	WATER SHEET (4 OF 4)
32	WASTEWATER SHEETS (1 OF 4)
33	WASTEWATER SHEETS (2 OF 4)
34	WASTEWATER SHEETS (3 OF 4)
35	WASTEWATER SHEETS (4 OF 4)
36	DETAILS SHEET

**APPROVED BY:**  
\_\_\_\_\_  
HAYS COUNTY DEVELOPMENT SERVICES DEPARTMENT      DATE

**APPROVED BY:**  
\_\_\_\_\_  
GIB WATT HAYS COUNTY FIRE DEPARTMENT      DATE

**CORRECTION / REVISION**

NO.	DESCRIPTION	REVISE (R) ADD (A) VOID (V) SHEET NO.'S	TOTAL SHEETS IN PLAN SET	NET CHANGE IMP. COVER	SITE IMP. COVER	% SITE IMP. COVER	APPROVED DATE	IMAGED DATE



**CAUTION - ELECTRICITY PRESENT**  
THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS THAT ENTER OR WORK ON THIS PROJECT ARE RESPONSIBLE FOR LOCATING, USING ONE-CALL OR THE ELECTRIC UTILITIES THEMSELVES, ALL OVERHEAD AND UNDERGROUND ELECTRICAL OF ANY NATURE AND FOR SAFEGUARDING ALL PERSONNEL ON THIS PROJECT, INCLUDING ANY OFF-SITE WORK AREAS SHOWN ON THE PLAN, FROM ANY INTERFERENCE WITH THE ELECTRIC LINES OR FROM DAMAGING, DIGGING UP OR UNCOVERING THE ELECTRIC LINES. GETTING A LADDER IN HARMS WAY OR ANY OTHER ACTIVITY OF ANY NATURE THAT COULD HARM ANY INDIVIDUAL IN ANY MANNER. THIS RESPONSIBILITY HEREBY REMOVES THE ENGINEER AND THE OWNER FROM ANY LIABILITY OF ANY NATURE.

O:\CompanyData\Clients\0946 - James Stinson\001-20-Carpenter Hill RV Park Development\CAD [Comm]\Sheets\0946-001-COVER.dwg -- Layout: "COVER SHEET" -- Fri, Oct 07, 2022, 10:41am, By: C1038 (jason)

NO.	REVISION	DATE

10.7.2022

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**Southwest Engineers**  
TBPE NO. F-1909  
www.swengineers.com

**HEADQUARTERS**  
307 Saint Lawrence Street, Gonzales TX 78629  
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**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4336

**WARNING**  
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CHECKED BY: HJ

COVER SHEET

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	_____
SHEET	1 OF 36



**GENERAL CONSTRUCTION NOTES**

- ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, HAYS COUNTY MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
- CONTRACTOR SHALL CALL TEXAS 811 (811 OR 1-800-344-8377) FOR UTILITY LOCATIONS PRIOR TO ANY WORK IN EASEMENTS OR STREET R.O.W.  
  
CONTRACTOR SHALL NOTIFY HAYS COUNTY - SITE & SUBDIVISION DIVISION TO SUBMIT REQUIRED DOCUMENTATION, PAY CONSTRUCTION INSPECTION FEES, AND TO SCHEDULE THE REQUIRED SITE AND SUBDIVISION PRE-CONSTRUCTION MEETING. THIS MEETING MUST BE HELD PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN THE R.O.W. OR PUBLIC EASEMENTS.
- FOR SLOPES OR TRENCHES GREATER THAN FIVE FEET IN DEPTH, A NOTE MUST BE ADDED STATING: "ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION." (OSHA STANDARDS MAY BE PURCHASED FROM THE GOVERNMENT PRINTING OFFICE; INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA, 611 EAST 6TH STREET, AUSTIN TEXAS.)
- ALL SITE WORK MUST ALSO COMPLY WITH ENVIRONMENTAL REQUIREMENTS.
- UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENTS AND PRIOR TO THE FOLLOWING, THE ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DRAINAGE, FILTRATION AND DETENTION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.:  
  
\* RELEASE OF THE CERTIFICATE OF OCCUPANCY BY THE DEVELOPMENT SERVICES DEPARTMENT (INSIDE THE CITY LIMITS) ; OR  
\* INSTALLATION OF AN ELECTRIC OR WATER METER (IN THE FIVE-MILE ETJ)

**DEVELOPER INFORMATION**

PRIMARY CONTACT PHONE \_\_\_\_\_

DEVELOPER PHONE \_\_\_\_\_

OWNER'S REPRESENTATIVE RESPONSIBLE FOR PLAN ALTERATIONS: \_\_\_\_\_

ENGINEER PHONE \_\_\_\_\_

PERSON OR FIRM RESPONSIBLE FOR LANDSCAPING \_\_\_\_\_

CONTRACTOR PHONE \_\_\_\_\_

PERSON OR FIRM RESPONSIBLE FOR EROSION/SEDIMENTATION CONTROL MAINTENANCE: \_\_\_\_\_

CONTRACTOR PHONE \_\_\_\_\_

**FIRE DEPARTMENT:  
HAYS COUNTY FIRE DEPARTMENT  
CONTACT: MARK WOBUS  
FIRE MARSHALL  
2171 YARRINGTON ROAD, SUITE 300  
KYLE TX  
(512) 393-7300**

**DEWATERING NOTES (IF APPLICABLE)**

- CONTRACTOR TO SUBMIT A DEWATERING PLAN WHICH MAY BE A TEMPORARY DIVERSION CHANNEL PIPE PUMPS, COFFER DAM OR OTHER APPROVED METHOD. CONTRACTOR WILL OBTAIN DEWATERING PLAN APPROVAL PRIOR TO CONSTRUCTION SAND BAGS, EARTHEN DIKES, OR OTHER ERODIBLE MATERIALS ARE NOT ACCEPTABLE.
- CONTRACTOR SHALL MAINTAIN THE DEWATERING SYSTEM TO ENSURE PERFORMANCE. IF NOT PERFORMING, CONTRACTOR MUST FOLLOW ENVIRONMENTAL INSPECTOR'S DIRECTION TO ENSURE PERFORMANCE.

THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CLEARANCES REQUIRED BY THE NATIONAL ELECTRIC SAFETY CODE, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS, CITY OF AUSTIN RULES AND REGULATIONS AND TEXAS STATE LAWS PERTAINING TO CLEARANCES WHEN WORKING IN CLOSE PROXIMITY TO OVERHEAD POWER LINES AND EQUIPMENT. AUSTIN ENERGY WILL NOT RENDER ELECTRIC SERVICE UNLESS REQUIRED CLEARANCE ARE MAINTAINED. ALL COST INCURRED BECAUSE OF FAILURE TO COMPLY WITH THE REQUIRED CLEARANCE WILL BE CHARGED TO THE OWNER.

**GENERAL PROVISIONS FOR FIRE SAFETY**

- FIRE DRIVE NOTE: ENTIRE LENGTH OF FIRE ACCESS ROADWAY SHALL BE AN APPROVED ALL-WEATHER SURFACE ABLE TO SUPPORT 75,000 LBS.**
- ALL PAVEMENT DRIVE AISLES TO BE FIRE ACCESS LANES. SIGNAGE TO BE PROVIDED AS NECESSARY. CONTRACTOR TO COORDINATE WITH HAYS COUNTY FIRE MARSHAL'S OFFICE FOR LOCATION OF SIGNAGE ALONG THE PAVEMENT DRIVE AISLES.**

**TCEQ WPAP GENERAL CONSTRUCTION NOTES**

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY WATER POLLUTION ABATEMENT PLAN GENERAL CONSTRUCTION NOTES EDWARDS AQUIFER PROTECTION PROGRAM CONSTRUCTION NOTES - LEGAL DISCLAIMER THE FOLLOWING/LISTED "CONSTRUCTION NOTES" ARE INTENDED TO BE ADVISORY IN NATURE ONLY AND DO NOT CONSTITUTE AN APPROVAL OR CONDITIONAL APPROVAL BY THE EXECUTIVE DIRECTOR (ED), NOR DO THEY CONSTITUTE A COMPREHENSIVE LISTING OF RULES OR CONDITIONS TO BE FOLLOWED DURING CONSTRUCTION. FURTHER ACTIONS MAY BE REQUIRED TO ACHIEVE COMPLIANCE WITH TCEQ REGULATIONS FOUND IN TITLE 30, TEXAS ADMINISTRATIVE CODE (TAC), CHAPTERS 213 AND 217, AS WELL AS LOCAL ORDINANCES AND REGULATIONS PROVIDING FOR THE PROTECTION OF WATER QUALITY. ADDITIONALLY, NOTHING CONTAINED IN THE FOLLOWING/LISTED "CONSTRUCTION NOTES" RESTRICTS THE POWERS OF THE ED, THE COMMISSION OR ANY OTHER GOVERNMENTAL ENTITY TO PREVENT, CORRECT, OR CURTAIL ACTIVITIES THAT RESULT OR MAY RESULT IN POLLUTION OF THE EDWARDS AQUIFER OR HYDROLOGICALLY CONNECTED SURFACE WATERS. THE HOLDER OF ANY EDWARDS AQUIFER PROTECTION PLAN CONTAINING "CONSTRUCTION NOTES" IS STILL RESPONSIBLE FOR COMPLIANCE WITH TITLE 30, TAC, CHAPTERS 213 OR ANY OTHER APPLICABLE TCEQ REGULATION, AS WELL AS ALL CONDITIONS OF AN EDWARDS AQUIFER PROTECTION PLAN THROUGH ALL PHASES OF PLAN IMPLEMENTATION. FAILURE TO COMPLY WITH ANY CONDITION OF THE ED'S APPROVAL, WHETHER OR NOT IN CONTRADICTION OF ANY "CONSTRUCTION NOTES," IS A VIOLATION OF TCEQ REGULATIONS AND ANY VIOLATION IS SUBJECT TO ADMINISTRATIVE RULES, ORDERS, AND PENALTIES AS PROVIDED UNDER TITLE 30, TAC § 213.10 (RELATING TO ENFORCEMENT). SUCH VIOLATIONS MAY ALSO BE SUBJECT TO CIVIL PENALTIES AND INJUNCTION. THE FOLLOWING/LISTED "CONSTRUCTION NOTES" IN NO WAY REPRESENT AN APPROVED EXCEPTION BY THE ED TO ANY PART OF TITLE 30 TAC, CHAPTERS 213 AND 217, OR ANY OTHER TCEQ APPLICABLE REGULATION

- A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
  - THE NAME OF THE APPROVED PROJECT;
  - THE ACTIVITY START DATE; AND
  - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
- ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
- IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
- NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
- ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.
- SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN TCEQ-0592 (REV. JULY 15, 2015) PAGE 2 OF 2 WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.
- LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGED OFFSITE.
- ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
- IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.
- THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
  - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR;
  - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND
  - THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.
12. THE HOLDER OF ANY APPROVED EDWARD AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
  - A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;
  - B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;
  - C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

AUSTIN REGIONAL OFFICE  
12100 PARK 35 CIRCLE, BUILDING A  
AUSTIN, TEXAS 78753-1808  
PHONE (512) 339-2929  
FAX (512) 339-3795

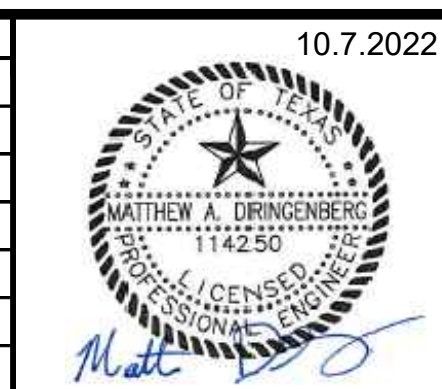
SAN ANTONIO REGIONAL OFFICE  
14250 JUDSON ROAD  
SAN ANTONIO, TEXAS 78233-4480  
PHONE (210) 490-3096  
FAX (210) 545-4329

**HAYS COUNTY STANDARD NOTES**

- TO ALL CONTRACTORS: GENERAL CONSTRUCTION NOTES FOR PLANS THESE PLANS ARE NOT TO BE CONSIDERED FINAL FOR CONSTRUCTION UNTIL APPROVED BY HAYS COUNTY. CHANGES MAY BE REQUIRED PRIOR TO APPROVAL.
- SEVENTY-TWO (72) HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION, THE DEVELOPER SHALL ARRANGE A PRE-CONSTRUCTION CONFERENCE WITH ALL PERTINENT PARTIES.
  - ALL ROADWAY AND DRAINAGE IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH HAYS COUNTY SPECIFICATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS FROM HAYS COUNTY ROAD AND BRIDGE DEPARTMENT PRIOR TO BEGINNING ANY ON-SITE CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING THE NECESSARY INSPECTIONS FROM THE HAYS COUNTY ROAD AND BRIDGE DEPARTMENT. ALL REPAIRS TO IMPROVEMENTS CAUSED BY CONTRACTOR'S FAILURE TO INSTALL IMPROVEMENTS IN ACCORDANCE WITH HAYS COUNTY SPECIFICATIONS AND THESE CONSTRUCTION PLANS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. HAYS COUNTY TRANSPORTATION DEPARTMENT'S ACCEPTANCE OF THE IMPROVEMENTS ARE CONTINGENT ON REPAIRS BEING MADE TO HAYS COUNTY'S SATISFACTION. DELAYS CAUSED BY REPAIRS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
  - A MINIMUM OF TWO (2) BENCHMARKS SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
  - ALL BEDDING MATERIALS USED WITHIN THE ROW SHALL COMPLY WITH COA ITEM 510.
  - ALL CONCRETE PLACED WITHIN THE ROW SHALL BE A MINIMUM OF CLASS A. THE USE OF REBAR CHAIRS AND TESTS CYLINDERS WILL BE REQUIRED ON PCC VALLEY GUTTER PLACEMENTS.
  - THE PROPOSED FULLY DEVELOPED STORMWATER RUNOFF RATE CANNOT EXCEED EXISTING CONDITIONS RUNOFF RATE.
  - DEWATERING OPERATIONS MUST USE SWPPP-SPECIFIED METHODS ONLY. IF SUCH METHODS ARE ONLY GENERAL OR NOT APPLICABLE, PUMP FROM THE TOP OF THE POOL (RATHER THAN THE BOTTOM) AND DISCHARGE TO A VEGETATED, UPLAND AREA (AWAY FROM WATERBODIES OR DRAINAGES) OR USE ANOTHER TYPE OF FILTRATION PRIOR TO DISCHARGE. REFER TO THE EPA 2017 GENERAL CONSTRUCTION PERMIT, SECTION 2.4, AS APPLICABLE.
  - THE CONTRACTOR SHALL SUPPLY QUALIFIED PERSONNEL TO PERFORM SWPPP INSPECTIONS ON PROJECT ≥ 1 ACRE. QUALIFIED PERSONNEL SHALL HAVE CISEC, CESSWI, OR EQUIVALENT CERTIFICATION APPROVED BY THE MS4.
  - CONTRACTOR SHALL ENSURE THAT MUD AND DEBRIS TRACKED ONTO PUBLICLY MAINTAINED ROADWAYS FROM VEHICLES LEAVING THE CONSTRUCTION SITE WILL BE CLEANED UP DAILY.
  - NO EXPLOSIVES SHALL BE USED FOR THIS PROJECT WITHOUT TCEQ APPROVAL.
  - ALL HOLES, TRENCHES AND OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY BARRICADES, FENCING, LIGHTS AND/OR OTHER PROTECTIVE DEVICES IN COMPLIANCE WITH COA 509S AND OSHA REGULATIONS AT ALL TIMES.
  - THE CONTRACTOR SHALL SUBMIT A TRENCH SAFETY PLAN PREPARED AND SEALED BY AN ENGINEER LICENSED BY THE STATE OF TEXAS PRIOR TO THE START OF THE PROJECT. THE CONTRACTOR SHALL ASSIGN A COMPETENT PERSON THAT HAS BEEN PROPERLY TRAINED AND IS QUALIFIED TO MAKE INSPECTIONS AND SUPERVISE THE INSTALLATION, MAINTENANCE, AND REMOVAL OF THE TRENCH SAFETY OR EXCAVATION SAFETY SYSTEM.
  - HAYS COUNTY IS NOT RESPONSIBLE FOR SIDEWALK MAINTENANCE. A FULLY EXECUTED LICENSE AGREEMENT MUST BE IN-PLACE PRIOR TO CONSTRUCTION OF SIDEWALKS WITHIN HAYS COUNTY ROW.
  - CONTRACTOR SHALL COMPLY WITH CONSTRUCTION SEQUENCING WHICH MAY BE SPECIFIED SOMEWHERE IN THE CONSTRUCTION PLANS.
  - PERMIT IS REQUIRED FOR CONSTRUCTION IN "RIGHT OF WAY": ORDINANCE 7.10. NODRIVEWAY, UTILITY CONSTRUCTION, MAILBOXES, LANDSCAPING OR ANY OTHER ENCROACHMENT INTO RIGHT-OF-WAY OR EASEMENT SHALL BE ALLOWED WITHOUT FIRST OBTAINING A PERMIT FROM THE HAYS COUNTY ROAD AND BRIDGE DEPARTMENT.
  - PRIOR TO THE INSTALLATION OF ANY ROAD BUILDING MATERIAL THE SUBGRADE SHALL BE INSPECTED BY HAYS COUNTY. PRIOR TO PAVING, BASE MATERIAL SHALL BE INSPECTED BY HAYS COUNTY. THE OWNER OR HIS AGENT SHALL NOTIFY HAYS COUNTY FORTY-EIGHT (48) HOURS PRIOR TO THE TIME WHEN THE INSPECTION IS NEEDED. ORDINANCE 1.05.2.06.
  - ALL OUTFALLS CONSTRUCTED WITHIN HAYS COUNTY MUST BE SUBMITTED TO HAYS COUNTY WITH GPS COORDINATES AT THE END OF EACH PROJECT. COORDINATES WILL BE SUBMITTED ON THE NAD 1983 STATE PLANE SOUTH CENTRAL FIPS 4204 FEET COORDINATE SYSTEM. ALL COORDINATES WILL BE SUBMITTED IN GRID UNITS THE REQUIRED FILE TYPE FOR COORDINATE DATA SUBMISSIONS IS \*.TXT FORMAT.
  - AT THE TIME A FINAL INSPECTION AND RELEASE OF PERFORMANCE SECURITY IS REQUESTED; THE DESIGN ENGINEER SHALL PROVIDE A COMPLETE SET OF "AS-BUILT" RECORD DRAWINGS IN PDF FORMAT (300DPI) ON A VIRUS FREE DISK AND SHALL CERTIFY THAT ALL ROAD AND DRAINAGE CONSTRUCTION HAS BEEN COMPLETED IN SUBSTANTIAL ACCORDANCE WITH PREVIOUSLY APPROVED PLANS AND SPECIFICATIONS, EXCEPT AS NOTED. NO PERFORMANCE SECURITY WILL BE RELEASED WITHOUT THESE EXHIBITS.

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**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4330

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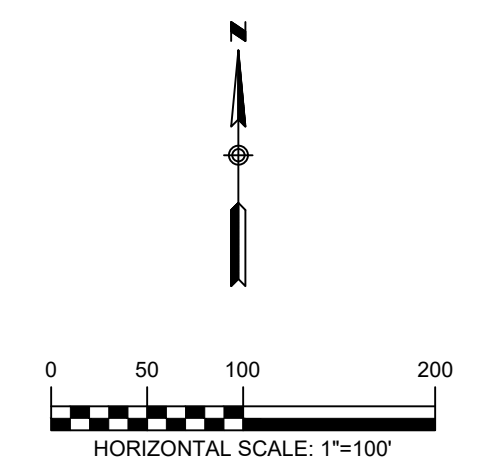
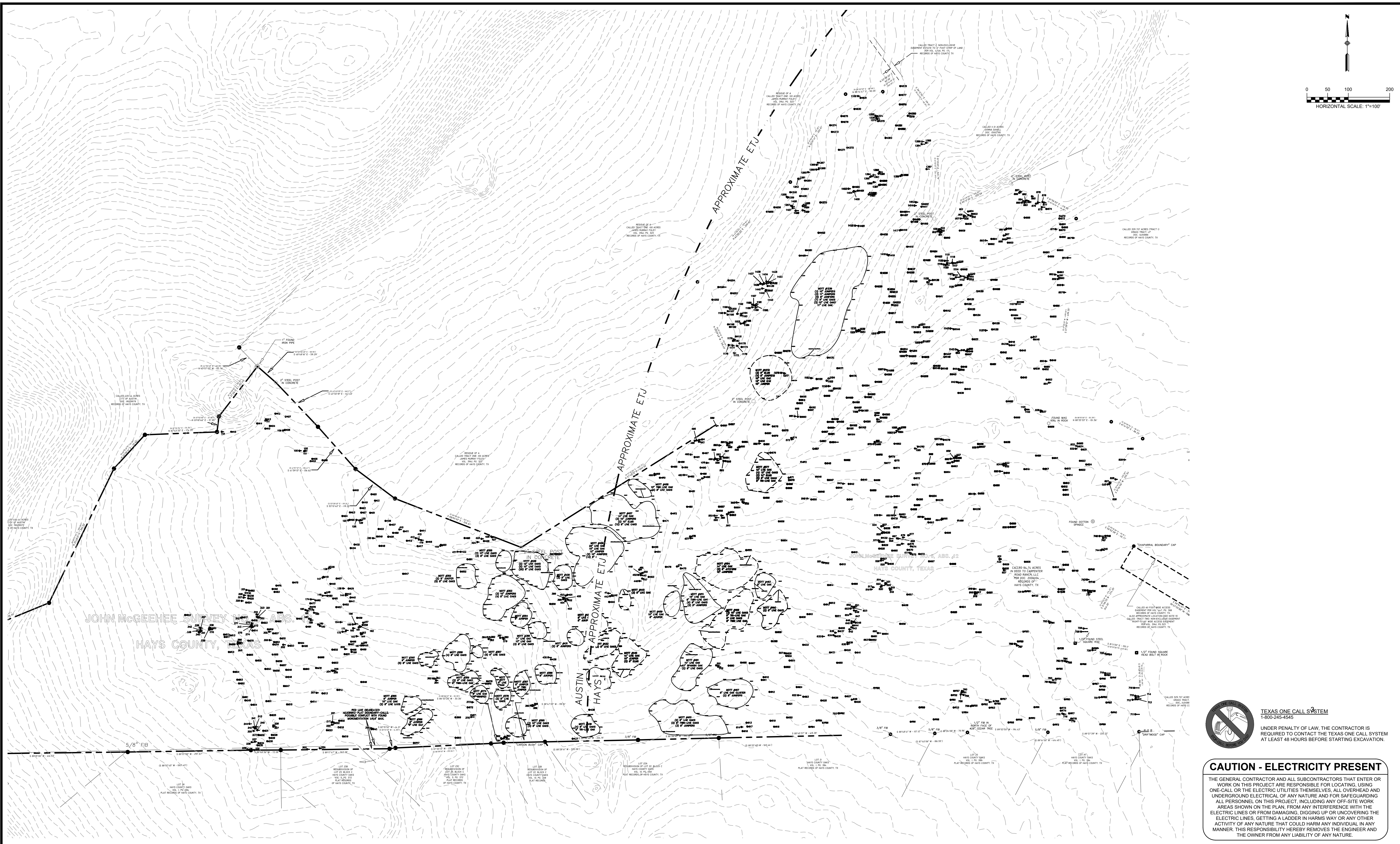
NOTES SHEET


**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. <u>0946-001</u>
DRAWING NO. _____
SHEET <u>2</u> OF <u>36</u>



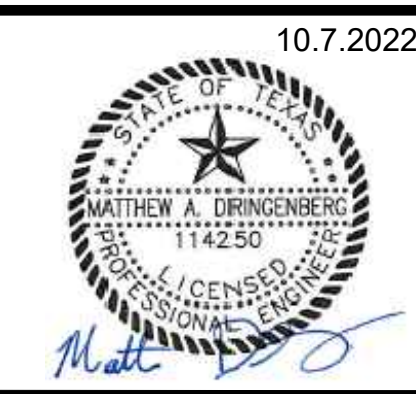
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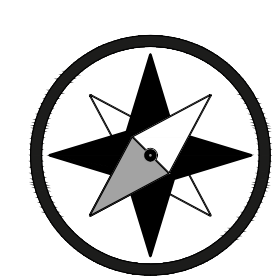
 **TEXAS ONE CALL SYSTEM**  
1-800-245-4545  
UNDER PENALTY OF LAW, THE CONTRACTOR IS REQUIRED TO CONTACT THE TEXAS ONE CALL SYSTEM AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

**CAUTION - ELECTRICITY PRESENT**  
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205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4330

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EXISTING CONDITIONS SHEET

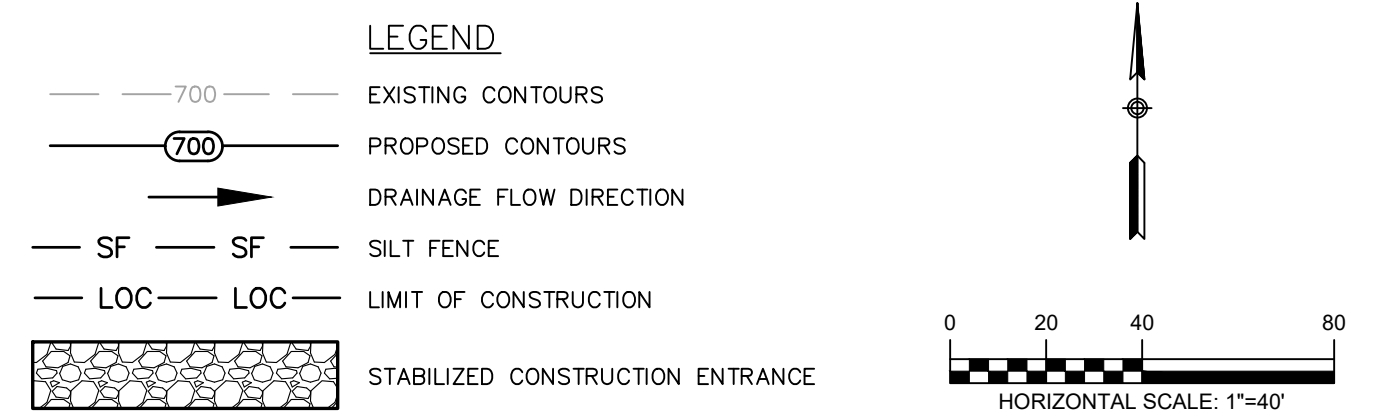
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

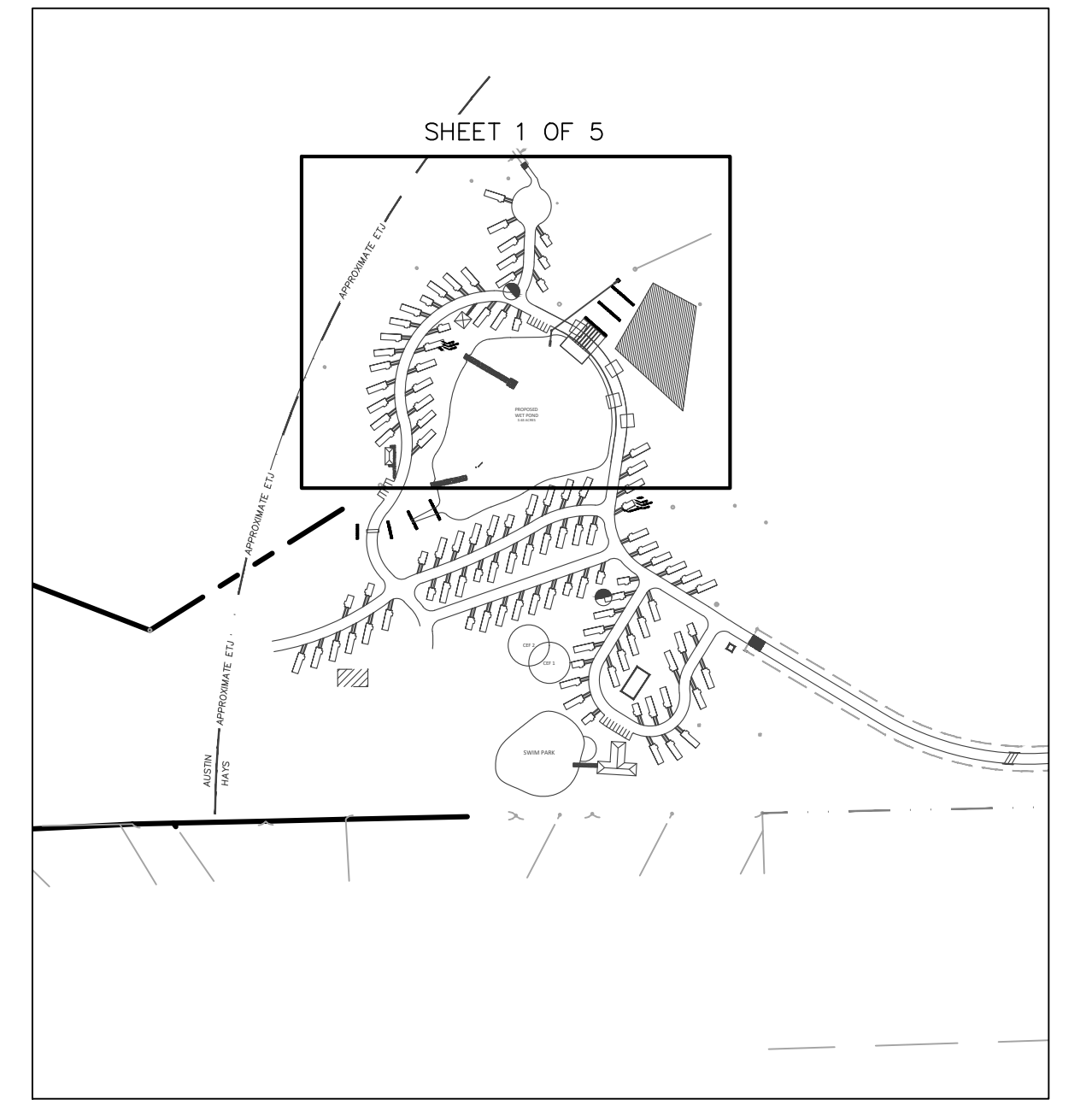
SHEET 3 OF 36





- SEQUENCE OF CONSTRUCTION**
1. INSTALL EROSION CONTROLS PER APPROVED PLAN.
  2. TEMPORARY CONTROLS TO BE INSPECTED AND MAINTAINED WEEKLY AND PRIOR TO ANTICIPATED RAINFALL EVENTS, AND AFTER RAINFALL EVENTS, AS NEEDED. CONTRACTOR/OWNER SHALL PROVIDE A CONTACT NAME AND NUMBER FOR EROSION CONTROL ISSUES.
  3. CONDUCT DEMOLITION ACTIVITIES, IF APPLICABLE.
  4. CONSTRUCT DRAINAGE IMPROVEMENTS, IF APPLICABLE.
  5. CONSTRUCT CURB INLET PROTECTION AT THE TIME OF CURB INLET INSTALLATION.
  6. CONSTRUCT DEVELOPMENT PER APPROVED PLANS.
  7. INSTALL STREETScape AND/OR LANDSCAPING IMPROVEMENTS.
  8. CONTRACTOR TO VEGETATE ANY DISTURBED AREAS ONCE FINAL GRADING IS COMPLETE, AND ESTABLISH A MIN OF 70% VEGETATION PRIOR TO COMPLETION. PER TPDES REQUIREMENTS, DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES WITHIN 21 DAYS. SEEDING DOES NOT CONSTITUTE AS STABILIZATION.
  9. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

**NOTE**  
 CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENT) AND SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITY RESUMES IN 21 DAYS, PER TPDES REQUIREMENTS.

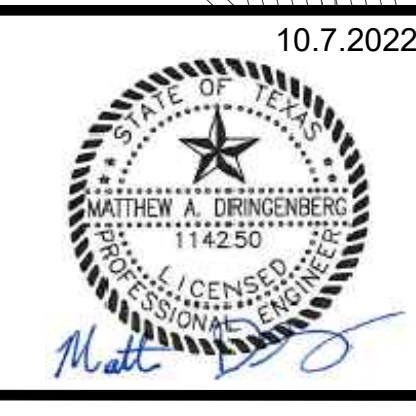


**TEXAS ONE CALL SYSTEM**  
 1-800-245-4545  
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**LIMITS OF CONSTRUCTION:**  
 ±1,401,032 SF = ±32.16 AC

NO.	REVISION	DATE



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 307 Saint Lawrence Street, Gonzales TX 78629  
 P: 830.672.7546 F: 830.672.2034

**CENTRAL TEXAS**  
 205 Cimarron Park Loop, Ste. B, Buda TX 78610  
 P: 512.312.4330

**WARNING**  
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DRAWN BY: AL  
 CHECKED BY: HJ

EROSION & SEDIMENTATION CONTROL PLAN (1 OF 5)

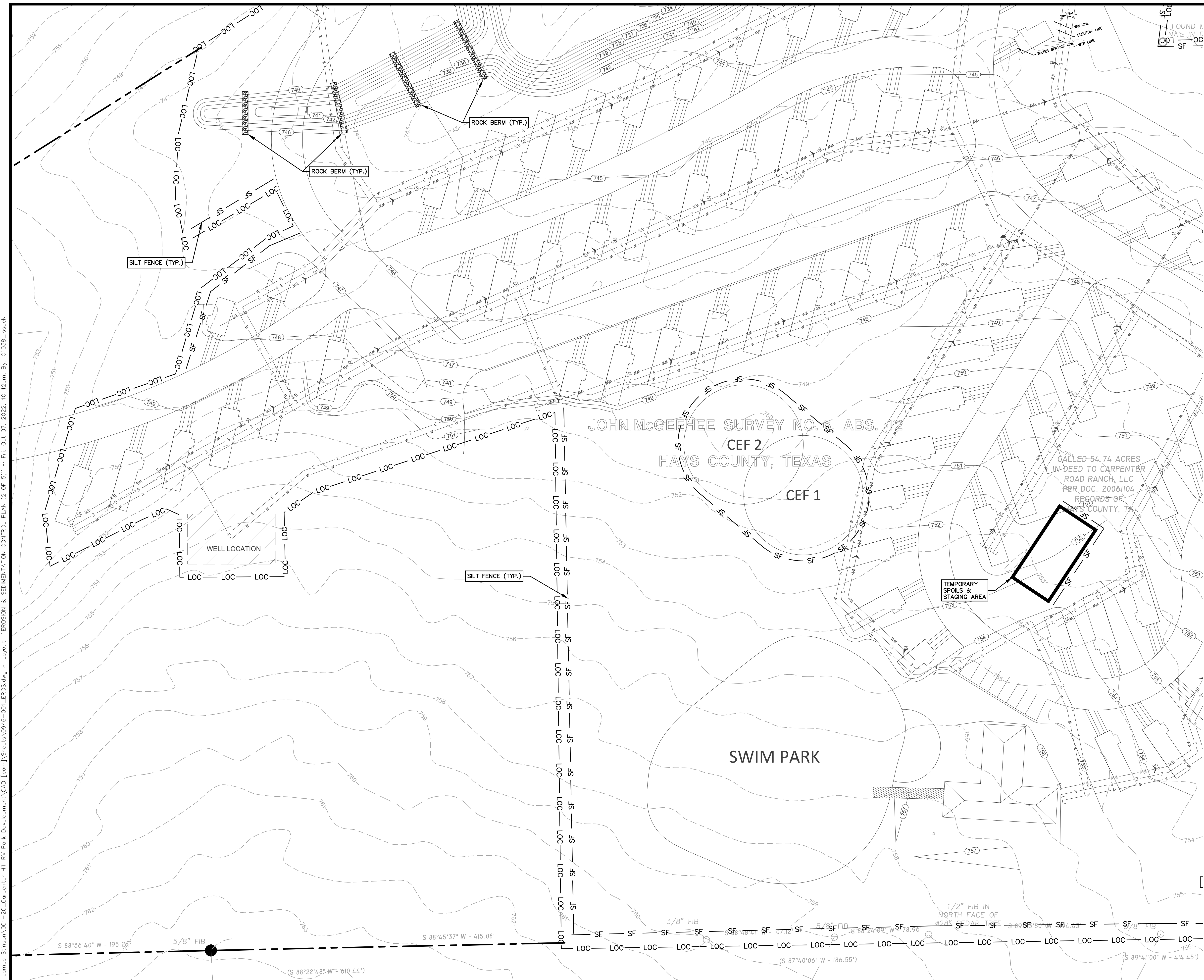
**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001  
 DRAWING NO. \_\_\_\_\_  
 SHEET 4 OF 36

O:\CompanyData\Clients\0946 - James, Stinson\09-20\_Carpenter Hill RV Park Development\CAD [Comm]\Sheets\0946-001\_EROS.dwg - Layout: "EROSION & SEDIMENTATION CONTROL PLAN (1 OF 5)" - Fri, Oct 07, 2022, 10:42am, Sfr, C103B\_messah



O:\CompanyData\Clients\0946 - James Sullivan\001-20-Carpenter Hill RV Park Development\CAD [Common]\Sedimentation\0946-001-EROS.dwg - Layout: "EROSION & SEDIMENTATION CONTROL PLAN (2 OF 5)" - Fri, Oct 07, 2022, 10:42am, Bjr, C103B, Reason



FOUND NAIL IN FIB  
SF

**LEGEND**

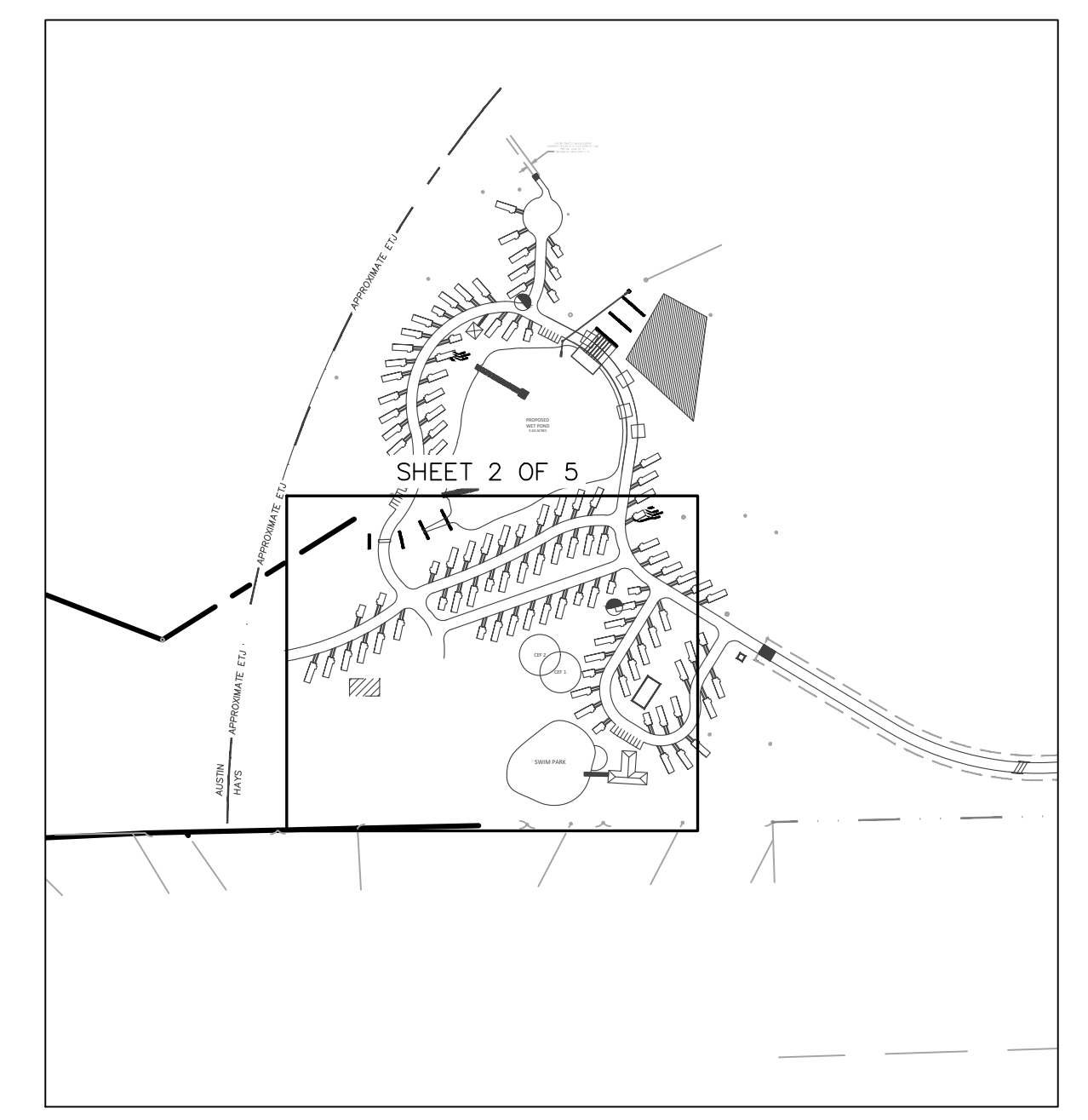
- EXISTING CONTOURS
- PROPOSED CONTOURS
- DRAINAGE FLOW DIRECTION
- SF SILT FENCE
- LOC LIMIT OF CONSTRUCTION
- STABILIZED CONSTRUCTION ENTRANCE

HORIZONTAL SCALE: 1"=40'

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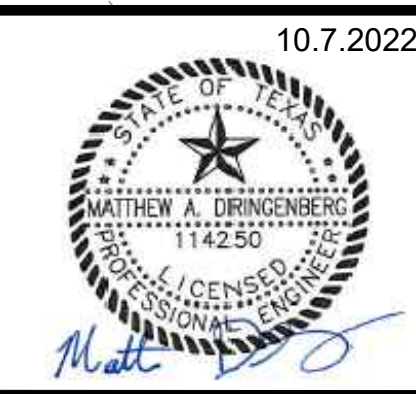
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EROSION & SEDIMENTATION CONTROL PLAN (2 OF 5)

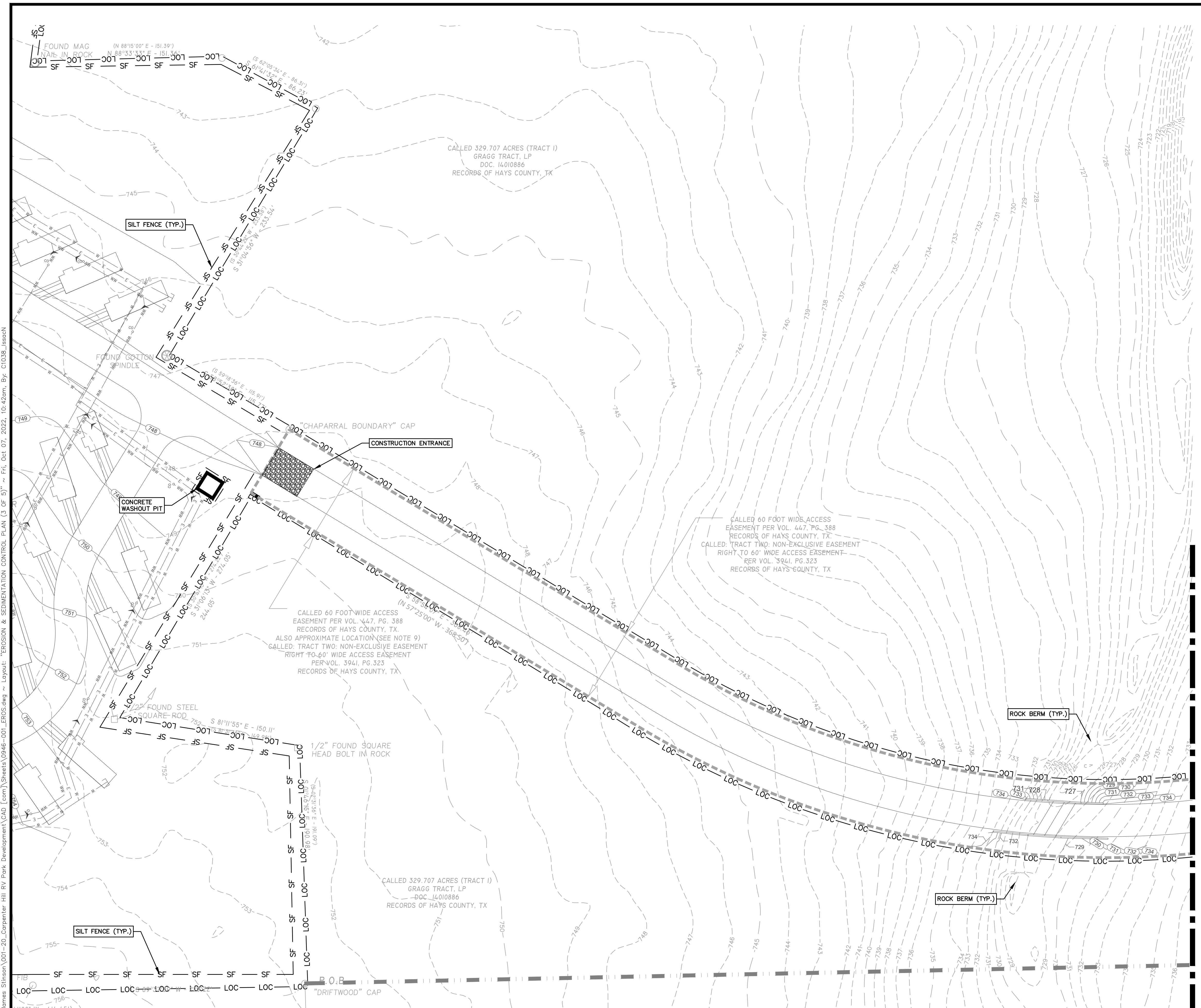
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 5 OF 36





**LEGEND**

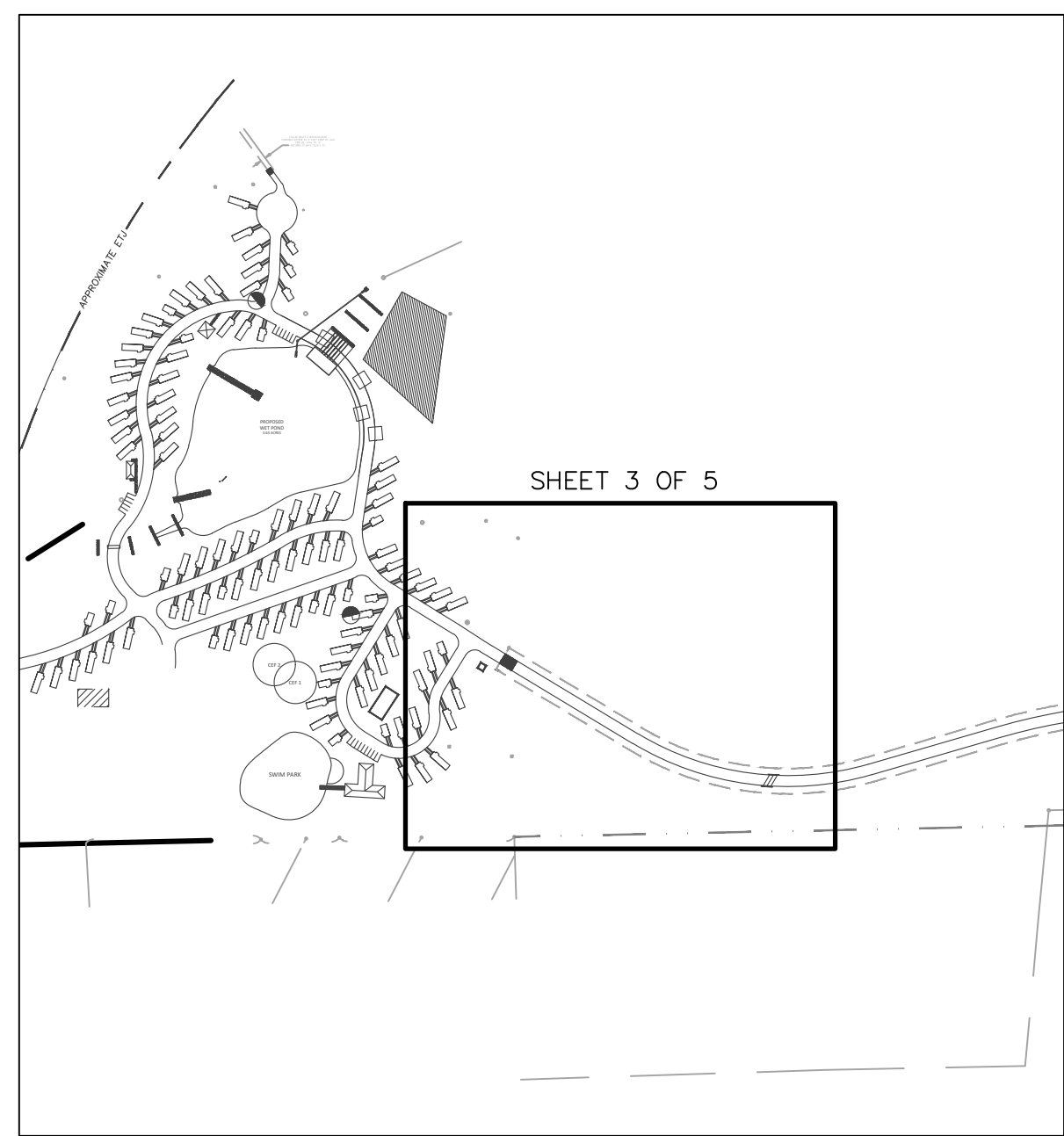
- 700 — EXISTING CONTOURS
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Matthew A. Dringenberg  
114250

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CHECKED BY: HJ

EROSION & SEDIMENTATION CONTROL PLAN (3 OF 5)

**CARPENTER RANCH RV PARK**  
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PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 6 OF 36

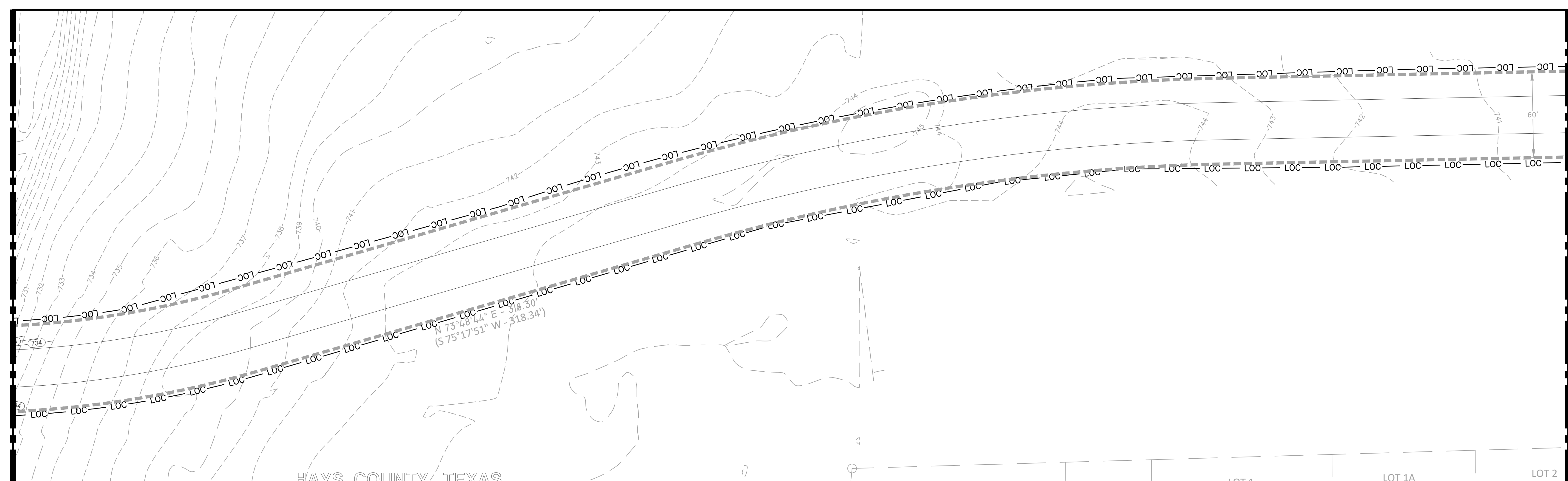
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O:\CompanyData\Clients\0946 - James Stinson\001-20-Carpenter Hill RV Park Development\CAD [Common]\Sheets\0946-001-EROSION & SEDIMENTATION CONTROL PLAN (4 OF 5).DWG - FRI, OCT 07, 2022, 10:42am, BY: C1038\_jason

MATCH LINE TO SHEET 6

MATCH LINE THIS SHEET



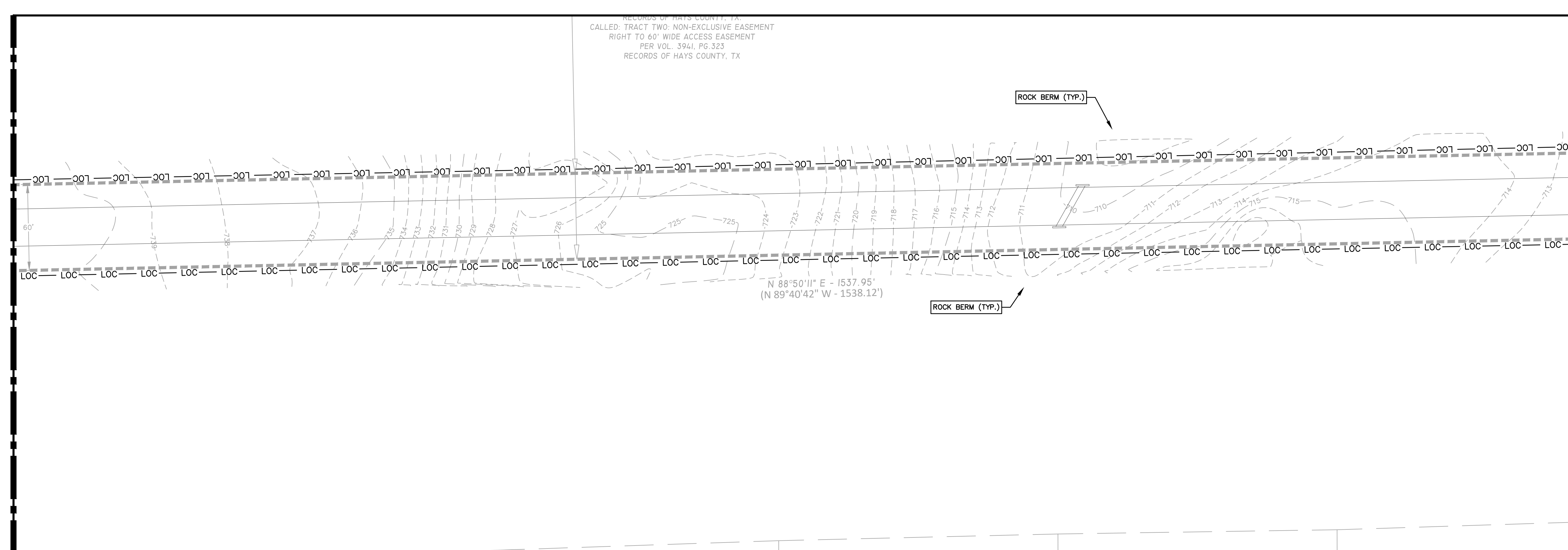
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**LEGEND**

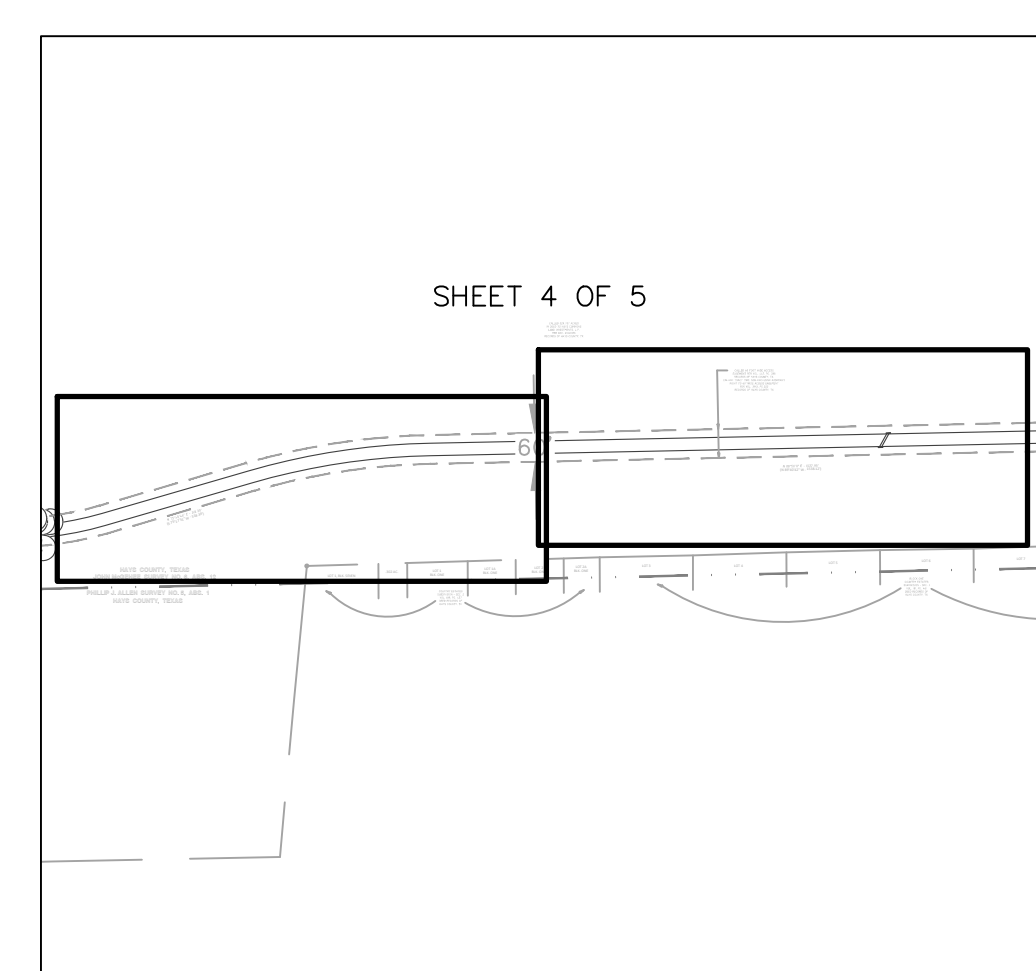
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MATCH LINE TO SHEET 8



**KEY MAP**  
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EROSION & SEDIMENTATION CONTROL PLAN (4 OF 5)

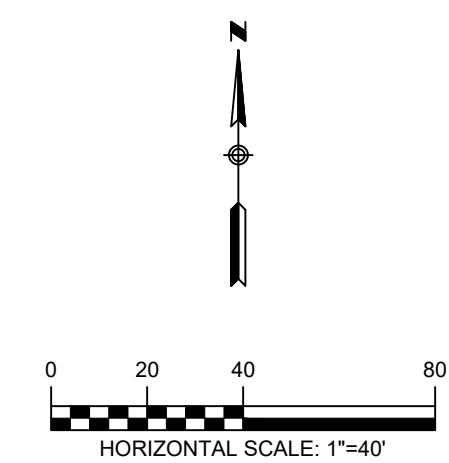
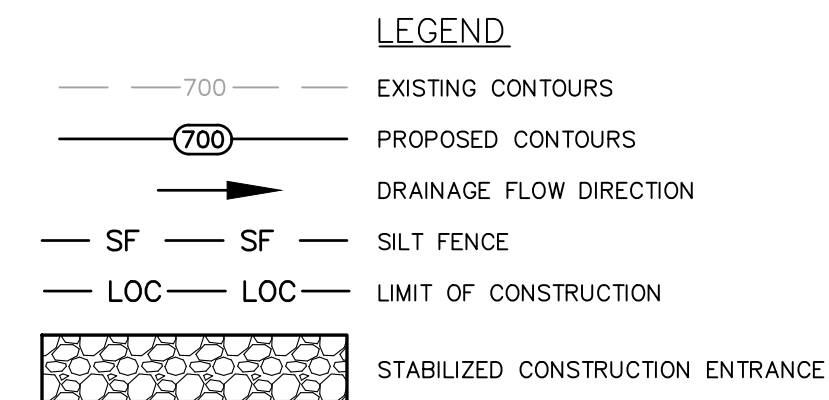
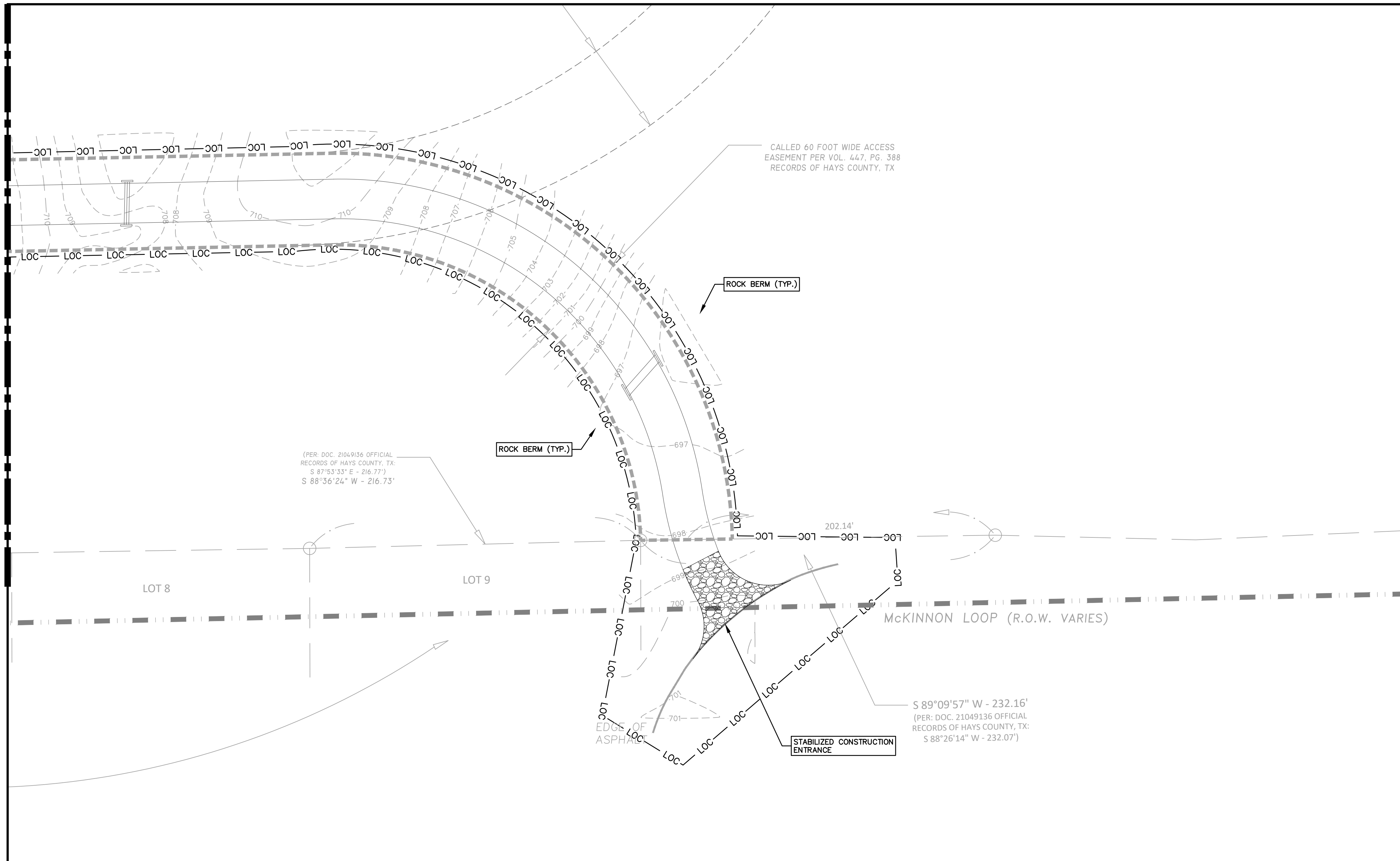
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PROJECT NO.	0946-001
DRAWING NO.	
SHEET	7 OF 36



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MATCH LINE TO SHEET 7

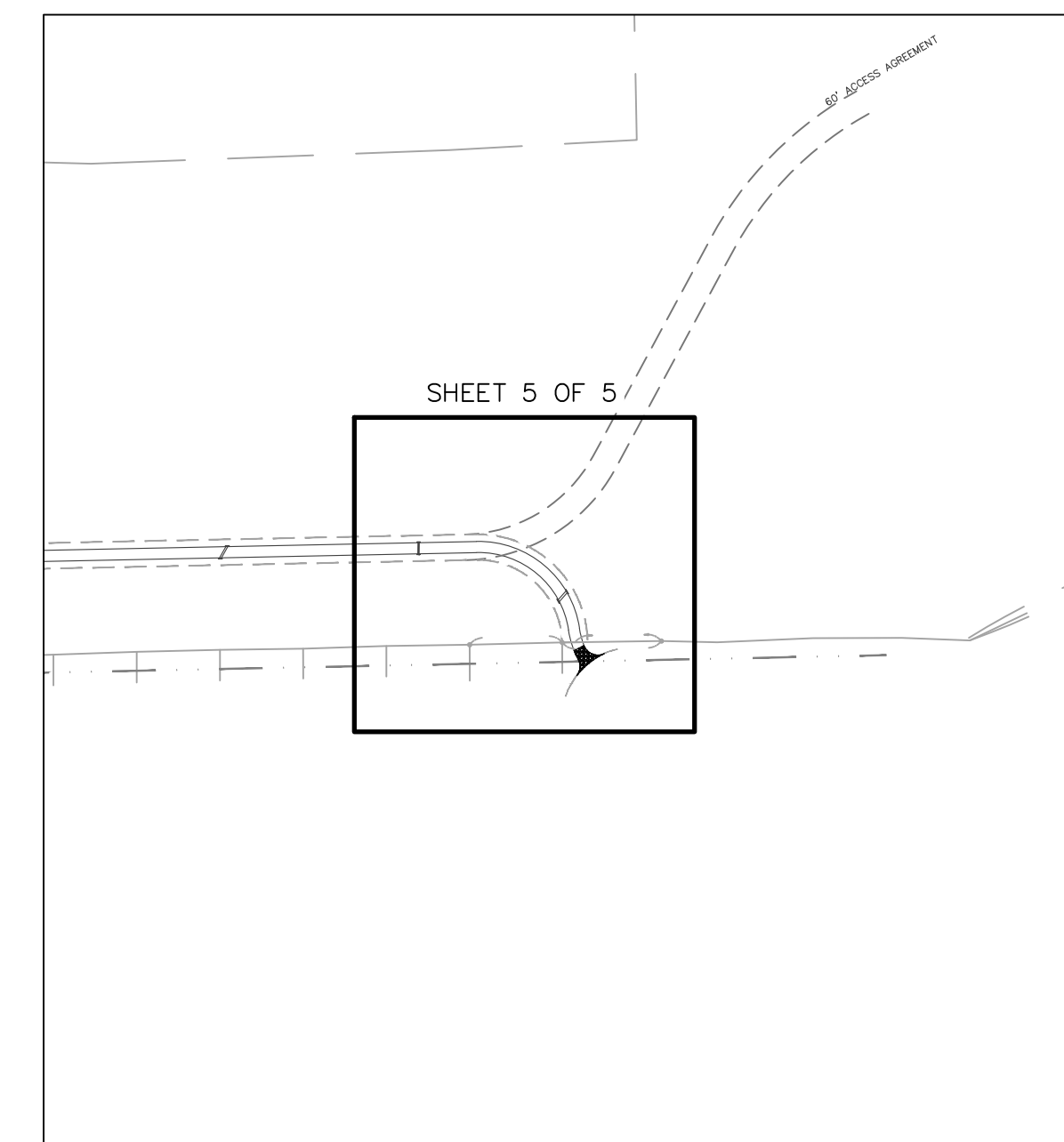


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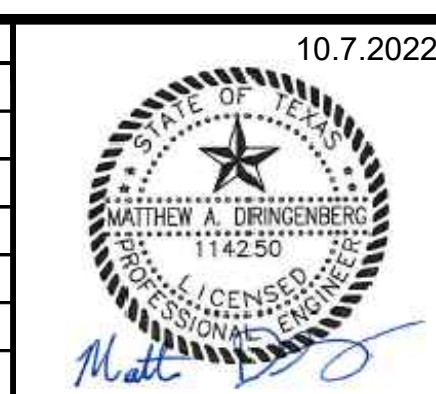
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EROSION & SEDIMENTATION CONTROL PLAN (5 OF 5)

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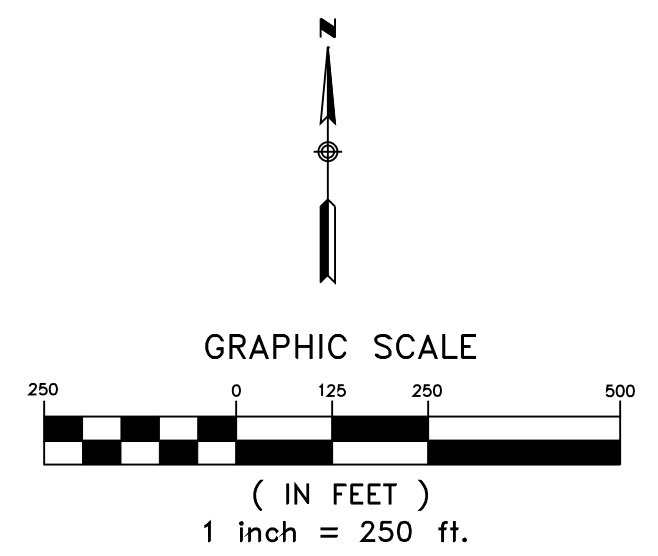
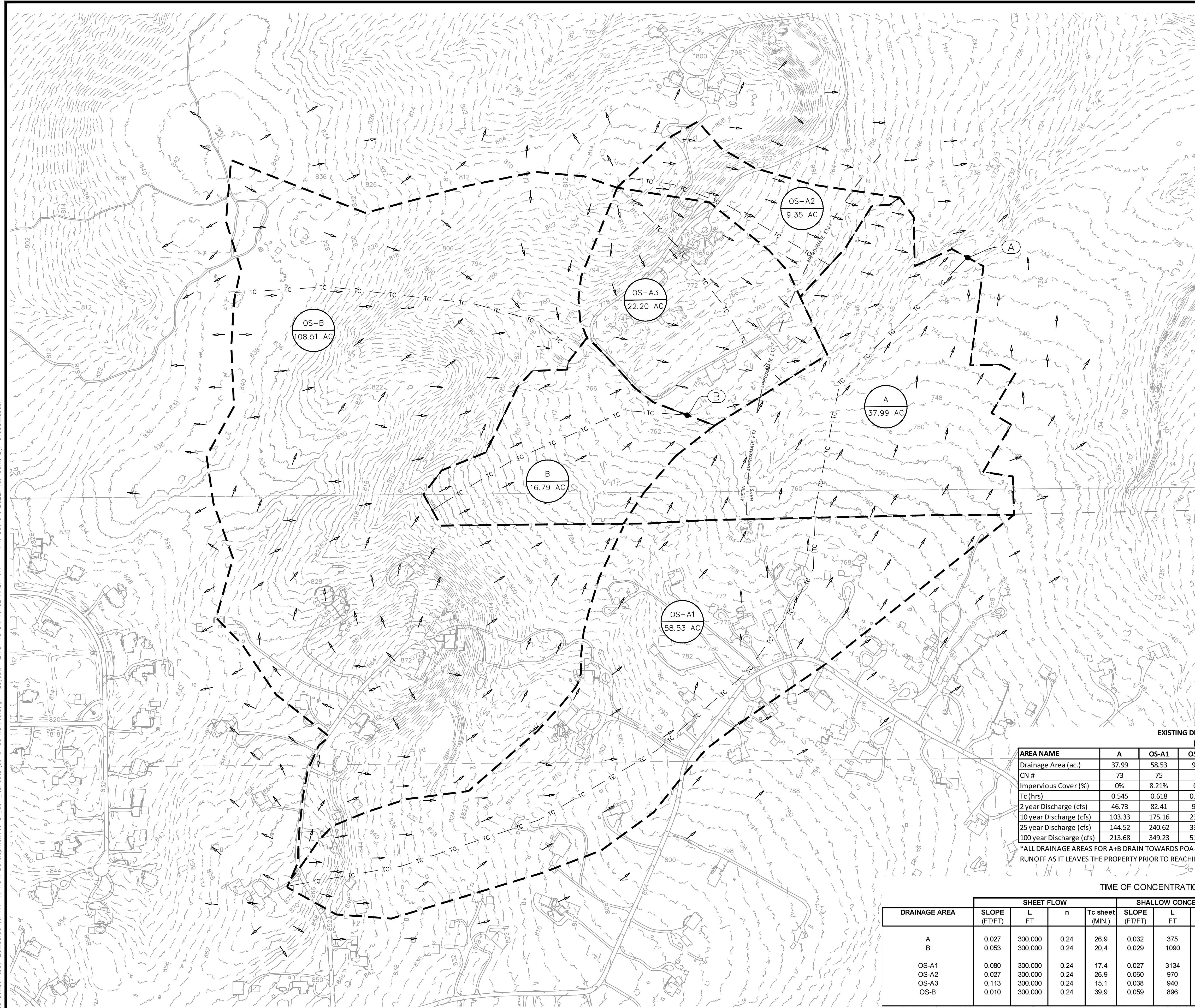
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SHEET 8 OF 36



C:\CompanyData\Clients\0946 - Jones, Skirwan\01-20\_Carpenter Hill RV Park Development\CAD\_Export\TERRAIN\TOPOGRAPHIC\EXISTING DRAINAGE AREA Map.dwg - Plt, Oct 07, 2022, 10:43am, Br. C1038, Jmash



- LEGEND**
- 700 --- EXISTING CONTOURS
  - 700 --- PROPOSED CONTOURS
  - --- DRAINAGE AREA
  - TC - TC TIME OF CONCENTRATION
  - A-1 ○ POINT OF ANALYSIS
  - ← DRAINAGE FLOW DIRECTION
  - DA ACRES DRAINAGE AREA LABEL
  - # INLET LABEL

- NOTES:**
- ON-SITE SURVEY TOPOGRAPHIC INFORMATION PROVIDED BY ALBERT LECKER CONSULTING, LLC OBTAINED ON SEPTEMBER, 2021
  - OFF-SITE TOPOGRAPHIC INFORMATION OBTAINED FROM TNIRIS.

**EXISTING DRAINAGE SUMMARY TABLE (NRCS METHOD)**

AREA NAME	A	OS-A1	OS-A2	OS-A3	B	OS-B	POA-A*	POA-B
Drainage Area (ac.)	37.99	58.53	9.35	22.20	16.79	108.51	-	-
CN #	73	75	69	69	67	73	-	-
Impervious Cover (%)	0%	8.21%	0%	2.16%	0%	2.41%	-	-
Tc (hrs)	0.545	0.618	0.515	0.335	0.451	0.768	-	-
2 year Discharge (cfs)	46.73	82.41	9.62	28.46	16.52	108.78	276.05	122.16
10 year Discharge (cfs)	103.33	175.16	23.44	68.61	41.84	243.68	619.44	276.93
25 year Discharge (cfs)	144.52	240.62	33.73	98.17	61.18	341.48	866.62	388.79
100 year Discharge (cfs)	213.68	349.23	51.32	148.22	94.72	507.37	1288.84	579.13

\*ALL DRAINAGE AREAS FOR A+B DRAIN TOWARDS POA-A, DA B + DA OS-B WERE CREATED TO ANALYZE THE STORM WATER RUNOFF AS IT LEAVES THE PROPERTY PRIOR TO REACHING POA-A.

**TIME OF CONCENTRATION**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)			Total Tc (MIN.)
	SLOPE (FT/FT)	L FT	n	Tc sheet (MIN.)	SLOPE (FT/FT)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (FT/S)	L	Tc Shallow (MIN.)	
A	0.027	300.000	0.24	26.9	0.032	375	N	2.2	4.00	900	3.75	32.8
B	0.053	300.000	0.24	20.4	0.029	1090	N	6.6	0.00	0	0.00	27.0
OS-A1	0.080	300.000	0.24	17.4	0.027	3134	N	19.8	0.00	0	0.00	37.1
OS-A2	0.027	300.000	0.24	26.9	0.060	970	N	4.1	0.00	0	0.00	31.0
OS-A3	0.113	300.000	0.24	15.1	0.038	940	N	5.0	0.00	0	0.00	20.1
OS-B	0.010	300.000	0.24	39.9	0.059	896	N	3.8	4.00	574	2.39	46.1

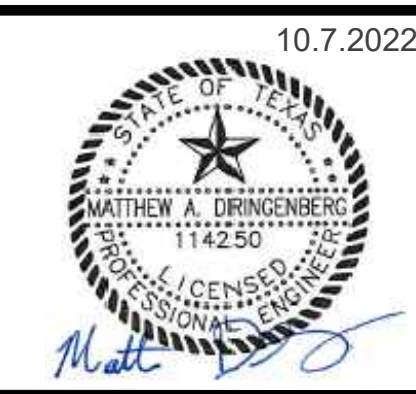
**TEXAS ONE CALL SYSTEM**  
1-800-245-4545

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NO.	REVISION	DATE



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TBPE NO. F-1909  
www.swengineers.com

**HEADQUARTERS**  
307 Saint Lawrence Street, Gonzales TX 78629  
P: 830.672.7546 F: 830.672.2034

**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
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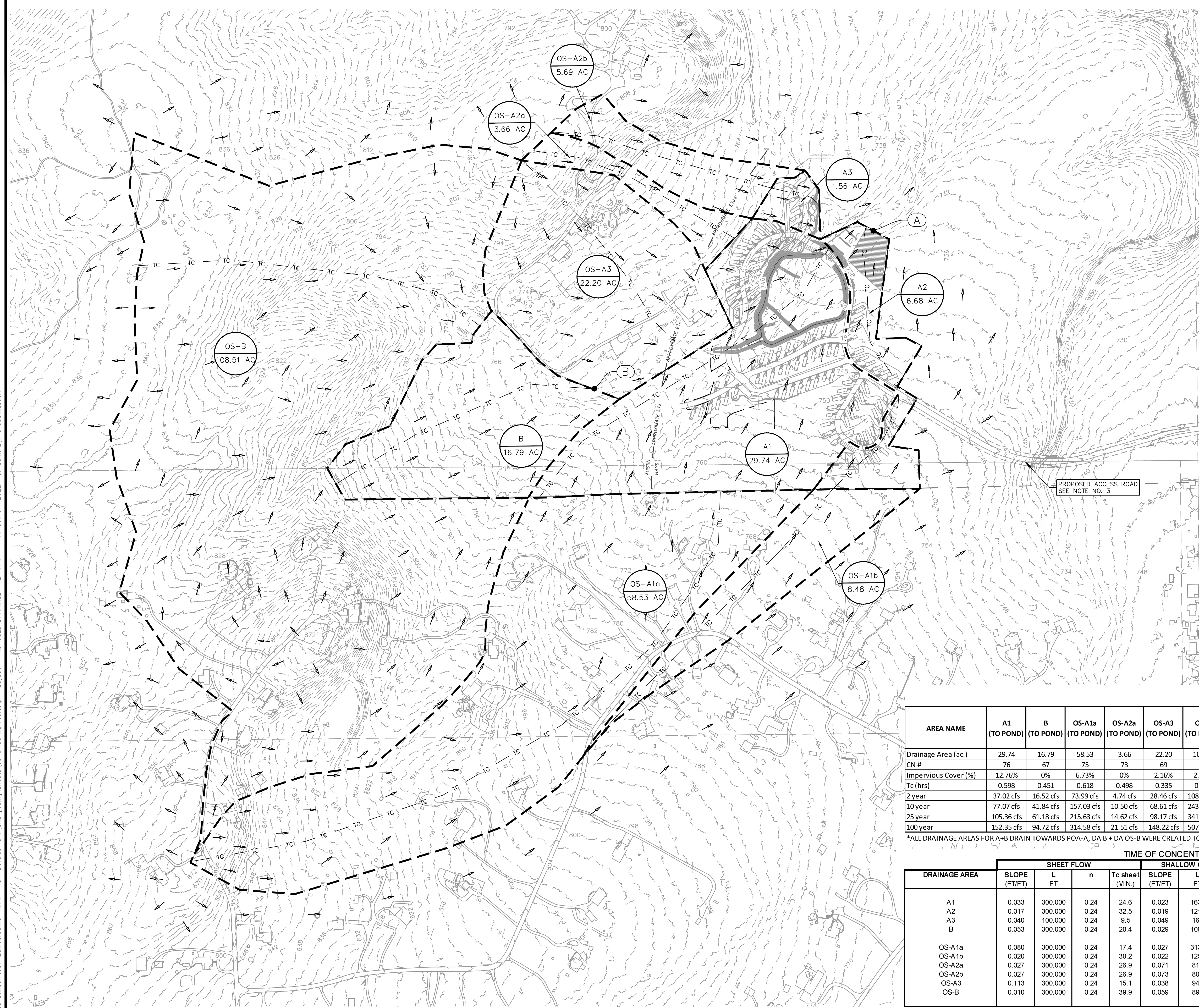
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EXISTING DRAINAGE AREA MAP

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	9 OF 36





**GRAPHIC SCALE**  
 ( IN FEET )  
 1 inch = 250 ft.

**LEGEND**

- 700 --- EXISTING CONTOURS
- 700 --- PROPOSED CONTOURS
- --- DRAINAGE AREA
- TC - TC TIME OF CONCENTRATION
- A-1 ○ POINT OF ANALYSIS
- ← DRAINAGE FLOW DIRECTION
- DA ACRES DRAINAGE AREA LABEL
- # INLET LABEL

- NOTES:**
- ON-SITE SURVEY TOPOGRAPHIC INFORMATION PROVIDED BY ALBERT LUECKER CONSULTING, LLC OBTAINED ON SEPTEMBER, 2021.
  - OFF-SITE TOPOGRAPHIC INFORMATION OBTAINED FROM TNRS.
  - REFER TO CULVERT AND CHANNEL DRAINAGE AREA MAP (SHEET 14) FOR ADDITIONAL DRAINAGE CALCULATIONS.

**DETENTION SUMMARY TABLE (NRCS METHOD)**

AREA NAME	A1 (TO POND)	B (TO POND)	OS-A1a (TO POND)	OS-A2a (TO POND)	OS-A3 (TO POND)	OS-B (TO POND)	DETENTION POND (WSE)	DETENTION POND RELEASE	A2 (BYPASS)	A3 (BYPASS)	OS-A1b (BYPASS)	OS-A2b (BYPASS)	PR POA A* (=DET. RELEASE +A2+A3+OS-A1b+OS-A2b)	EX POA-A*	PR POA-B (=B+OS-B)	EX POA-B
Drainage Area (ac.)	29.74	16.79	58.53	3.66	22.20	108.51	-	-	6.68	1.56	8.48	5.69	-	-	-	-
CN #	76	67	75	73	69	73	-	-	76	80	74	73	-	-	-	-
Impervious Cover (%)	12.76%	0%	6.73%	0%	2.16%	2.41%	-	-	13.17%	26.92%	5.90%	0%	-	-	-	-
Tc (hrs)	0.598	0.451	0.618	0.498	0.335	0.768	-	-	0.689	0.171	0.649	0.499	-	-	-	-
2 year	37.02 cfs	16.52 cfs	73.99 cfs	4.74 cfs	28.46 cfs	108.78 cfs	738.80 (msl)	244.17 cfs	8.31 cfs	4.35 cfs	9.88 cfs	7.34 cfs	268.95 cfs	276.05 cfs	122.16	122.16
10 year	77.07 cfs	41.84 cfs	157.03 cfs	10.50 cfs	68.61 cfs	243.68 cfs	739.40 (msl)	550.98 cfs	17.33 cfs	8.24 cfs	21.54 cfs	16.27 cfs	605.51 cfs	619.44 cfs	276.93	276.93
25 year	105.36 cfs	61.18 cfs	215.63 cfs	14.62 cfs	98.17 cfs	341.48 cfs	739.75 (msl)	772.33 cfs	23.63 cfs	10.87 cfs	29.84 cfs	22.65 cfs	849.18 cfs	861.55 cfs	388.79	388.79
100 year	152.35 cfs	94.72 cfs	314.58 cfs	21.51 cfs	148.22 cfs	507.37 cfs	740.29 (msl)	1151.95 cfs	34.20 cfs	15.12 cfs	43.75 cfs	33.33 cfs	1264.56 cfs	1288.84 cfs	579.13	579.13

\*ALL DRAINAGE AREAS FOR A+B DRAIN TOWARDS POA-A, DA B + DA OS-B WERE CREATED TO ANALYZE THE STORM WATER RUNOFF AS IT LEAVES THE PROPERTY PRIOR TO REACHING POA-A.

**TIME OF CONCENTRATION**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)				Total Tc (MIN.)
	SLOPE (F1/F1)	L FT	n	Tc sheet (MIN.)	SLOPE (F1/F1)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (F1/S)	L	Tc Shallow (MIN.)		
A1	0.033	300.000	0.24	24.6	0.023	1636	Y	8.9	0.00	0	0.00	33.5	
A2	0.017	300.000	0.24	32.5	0.019	1215	N	9.1	0.00	0	0.00	41.6	
A3	0.040	100.000	0.24	9.5	0.048	162	Y	0.6	0.00	0	0.00	10.1	
B	0.053	300.000	0.24	20.4	0.029	1090	N	6.6	0.00	0	0.00	27.0	
OS-A1a	0.080	300.000	0.24	17.4	0.027	3134	N	19.8	0.00	0	0.00	37.1	
OS-A1b	0.020	300.000	0.24	30.2	0.022	1256	N	8.7	0.00	0	0.00	38.9	
OS-A2a	0.027	300.000	0.24	26.9	0.071	818	N	0.0	0.00	0	0.00	26.9	
OS-A2b	0.027	300.000	0.24	26.9	0.073	800	N	0.0	0.00	0	0.00	26.9	
OS-A3	0.113	300.000	0.24	15.1	0.038	940	N	5.0	0.00	0	0.00	20.1	
OS-B	0.010	300.000	0.24	39.9	0.059	896	N	3.8	4.00	574	2.39	46.1	

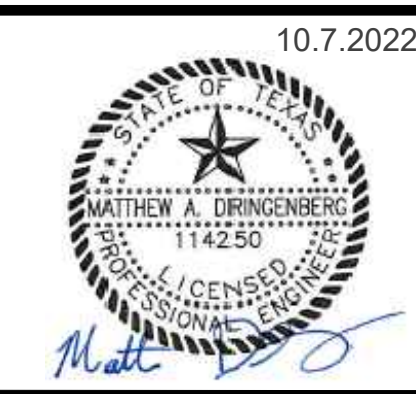
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 CHECKED BY: HJ

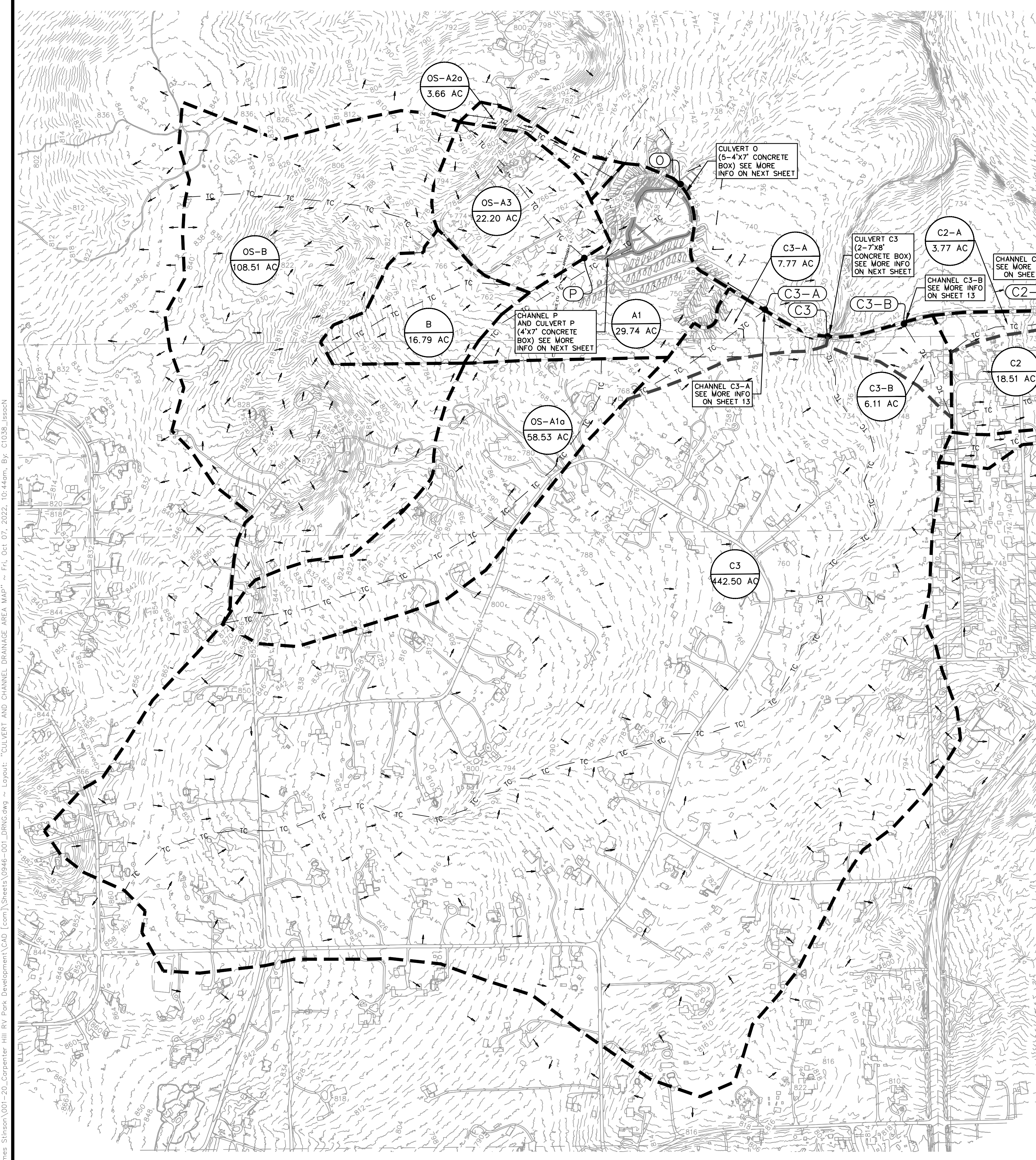
PROPOSED DRAINAGE AREA MAP

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	10 OF 36



C:\Users\jacob\OneDrive\Desktop\Projects\0946-001\Drawings\0946-001\DWG\07\_2022\_10\_44.dwg - File: 07\_2022\_10\_44.dwg, By: C1038 - jacob



**TIME OF CONCENTRATION - CHANNEL**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)			
	SLOPE (FT/FT)	L FT	n	Tc sheet (MIN.)	SLOPE (FT/FT)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (FT/S)	L	Tc Shallow (MIN.)	Total Tc (MIN.)
B	0.053	300.000	0.24	20.4	0.029	1090	N	6.6	0.00	0	0.00	27.0
OS-B	0.010	300.000	0.24	39.9	0.059	896	N	3.8	4.00	574	2.39	46.1
OS-A3	0.113	300.000	0.24	15.1	0.038	940	N	5.0	0.00	0	0.00	20.1

**CHANNEL DRAINAGE SUMMARY TABLE (NRCS METHOD)**

AREA NAME	B	OS-B	OS-A3	POA-P
Drainage Area (ac.)	16.79	108.51	22.20	-
CN #	67	73	69	-
Impervious Cover (%)	0%	2.41%	2.16%	-
Tc (hrs)	0.451	0.768	0.335	-
2 year Discharge (cfs)	16.52	108.78	28.46	139.77
10 year Discharge (cfs)	41.84	243.68	68.61	320.19
25 year Discharge (cfs)	61.18	341.48	98.17	453.88
100 year Discharge (cfs)	94.72	507.37	148.22	682.16

**C CULVERTS - DRAINAGE SUMMARY TABLE (NRCS METHOD)**

AREA NAME	C1	C2	C3	POA-C1	POA-C2	POA-C3
Drainage Area (ac.)	19.86	18.51	442.50	-	-	-
CN #	83	73	69	-	-	-
Impervious Cover (%)	20.35%	16.75%	23.05%	-	-	-
Tc (hrs)	0.386	0.302	1.494	-	-	-
2 year Discharge (cfs)	44.50	46.65	455.26	44.50	46.65	455.26
10 year Discharge (cfs)	82.14	85.82	871.11	82.14	85.82	871.11
25 year Discharge (cfs)	107.26	111.93	1160.75	107.26	111.93	1160.75
100 year Discharge (cfs)	147.75	153.91	1652.63	147.75	153.91	1652.63

**TIME OF CONCENTRATION - CULVERTS**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)			
	SLOPE (FT/FT)	L FT	n	Tc sheet (MIN.)	SLOPE (FT/FT)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (FT/S)	L	Tc Shallow (MIN.)	Total Tc (MIN.)
C1	0.020	100.000	0.24	12.5	0.030	1781	N	10.7	4.00	0	0.00	23.2
C2	0.020	100.000	0.24	12.5	0.046	1156	N	5.6	4.00	0	0.00	18.1
C3	0.007	300.000	0.24	46.0	0.022	4349	N	30.3	4.00	3211	13.38	89.6

**ROADSIDE CHANNEL DRAINAGE SUMMARY TABLE (NRCS METHOD)**

AREA NAME	C1-A	C2-A	C3-A	C3-B	POA-C1-A	POA-C2-A	POA-C3-A	POA-C3-B
Drainage Area (ac.)	3.56	3.77	7.77	6.11	-	-	-	-
CN #	73	73	75	74	-	-	-	-
Impervious Cover (%)	0%	0%	7.70%	4.73%	-	-	-	-
Tc (hrs)	0.269	0.360	0.321	0.396	-	-	-	-
2 year Discharge (cfs)	6.24	5.77	13.88	9.44	6.24	5.77	13.88	9.44
10 year Discharge (cfs)	13.66	12.76	29.05	20.26	13.66	12.76	29.05	20.26
25 year Discharge (cfs)	18.95	17.75	39.95	27.92	18.95	17.75	39.95	27.92
100 year Discharge (cfs)	27.70	26.06	57.94	40.85	27.70	26.06	57.94	40.85

**TIME OF CONCENTRATION - CULVERTS**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)			
	SLOPE (FT/FT)	L FT	n	Tc sheet (MIN.)	SLOPE (FT/FT)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (FT/S)	L	Tc Shallow (MIN.)	Total Tc (MIN.)
C1-A	0.030	100.000	0.24	10.7	0.010	518	N	5.4	4.00	0	0.00	16.1
C2-A	0.010	100.000	0.24	16.6	0.034	905	N	5.1	4.00	0	0.00	21.6
C3-A	0.020	100.000	0.24	12.5	0.010	631	N	6.7	4.00	0	0.00	19.2
C3-B	0.010	100.000	0.24	16.6	0.011	731	N	7.2	4.00	0	0.00	23.8

**CULVERT O - DRAINAGE SUMMARY TABLE (NRCS METHOD)**

AREA NAME	A1	B	OS-A1a	OS-A2a	OS-A3	OS-B	POA-O
Drainage Area (ac.)	29.74	16.79	58.53	3.66	22.20	108.51	-
CN #	76	67	75	73	69	73	-
Impervious Cover (%)	12.76%	0%	6.73%	0%	2.16%	2.41%	-
Tc (hrs)	0.598	0.451	0.618	0.498	0.335	0.768	-
2 year Discharge (cfs)	37.02 cfs	16.52 cfs	73.99 cfs	4.74 cfs	28.46 cfs	108.78 cfs	254.57
10 year Discharge (cfs)	77.07 cfs	41.84 cfs	157.03 cfs	10.50 cfs	68.61 cfs	243.68 cfs	563.93
25 year Discharge (cfs)	105.36 cfs	61.18 cfs	215.63 cfs	14.62 cfs	98.17 cfs	341.48 cfs	789.11
100 year Discharge (cfs)	152.35 cfs	94.72 cfs	314.58 cfs	21.51 cfs	148.22 cfs	507.37 cfs	1169.90

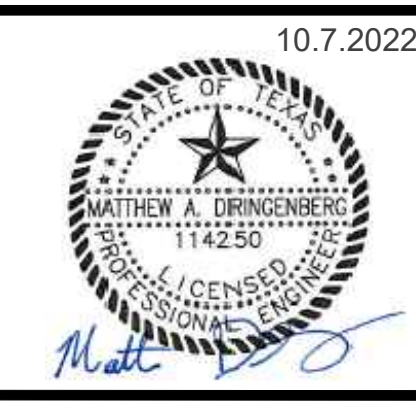
**TIME OF CONCENTRATION - OUTFALL**

DRAINAGE AREA	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW (GUTTER)			
	SLOPE (FT/FT)	L FT	n	Tc sheet (MIN.)	SLOPE (FT/FT)	L FT	Paved? Y or N	Tc Shallow (MIN.)	Vavg (FT/S)	L	Tc Shallow (MIN.)	Total Tc (MIN.)
A1	0.033	300.000	0.24	24.6	0.023	1636	Y	8.9	0.00	0	0.00	33.5
B	0.053	300.000	0.24	20.4	0.029	1090	N	6.6	0.00	0	0.00	27.0
OS-A1a	0.080	300.000	0.24	17.4	0.027	3134	N	19.8	0.00	0	0.00	37.1
OS-A2a	0.027	300.000	0.24	26.9	0.071	818	N	0.0	0.00	0	0.00	26.9
OS-A3	0.113	300.000	0.24	15.1	0.038	940	N	5.0	0.00	0	0.00	20.1
OS-B	0.010	300.000	0.24	39.9	0.059	896	N	3.8	4.00	574	2.39	46.1

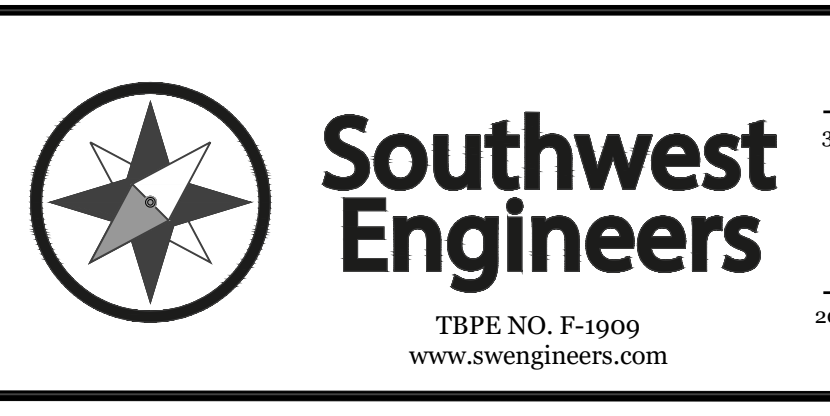
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CULVERT AND CHANNEL DRAINAGE AREA MAP

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

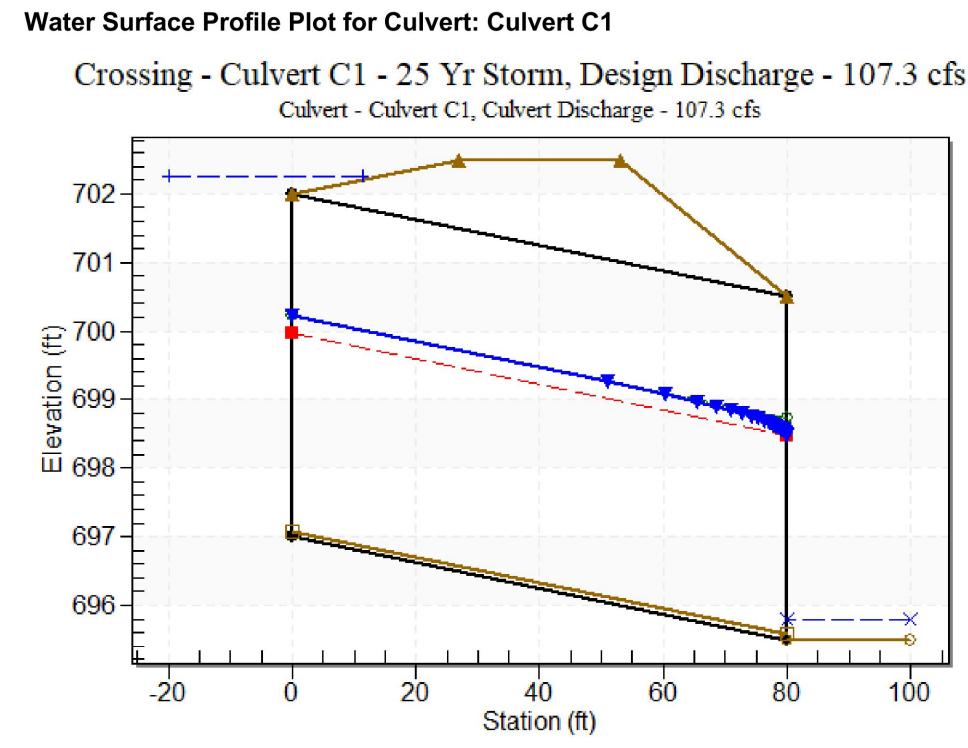
PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 11 OF 36



HY-8 Culvert Analysis Report



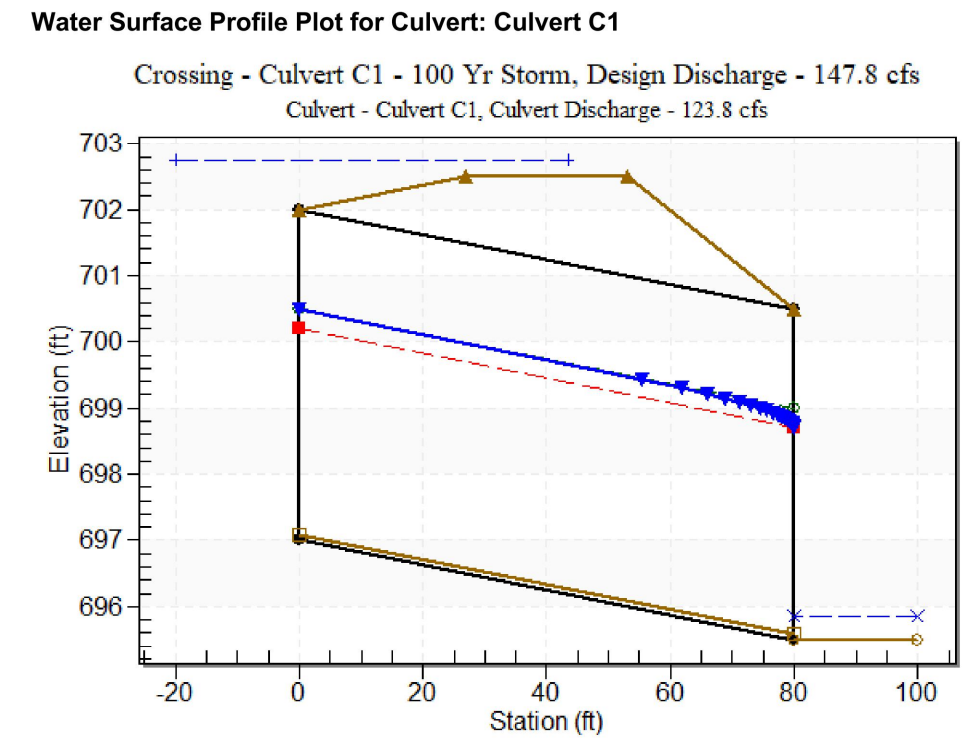
**Site Data - Culvert C1**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 697.00 ft  
 Outlet Station: 80.00 ft  
 Outlet Elevation: 695.50 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert C1 - 25 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 117.00 ft  
 Channel Slope: 0.0200  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 695.50 ft

**Roadway Data for Crossing: Culvert C1 - 25 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 63.00 ft  
 Crest Elevation: 702.50 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C1**  
 Barrel Shape: Circular  
 Barrel Diameter: 5.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge with Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



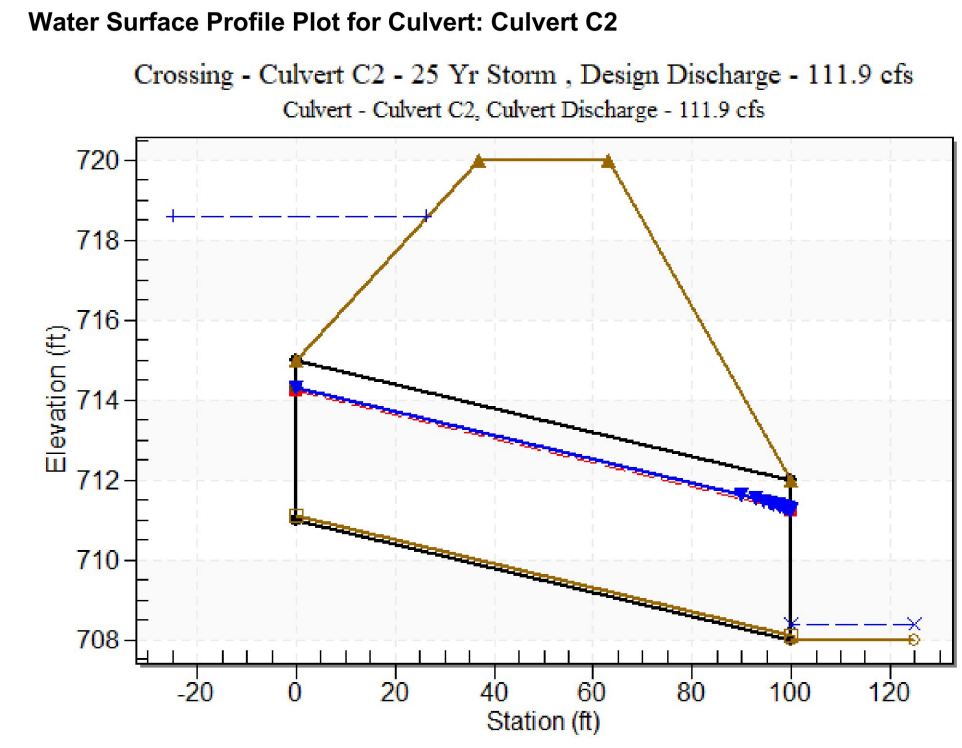
**Site Data - Culvert C1**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 697.00 ft  
 Outlet Station: 80.00 ft  
 Outlet Elevation: 695.50 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert C1 - 100 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 117.00 ft  
 Channel Slope: 0.0200  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 695.50 ft

**Roadway Data for Crossing: Culvert C1 - 100 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 63.00 ft  
 Crest Elevation: 702.50 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C1**  
 Barrel Shape: Circular  
 Barrel Diameter: 5.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge with Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



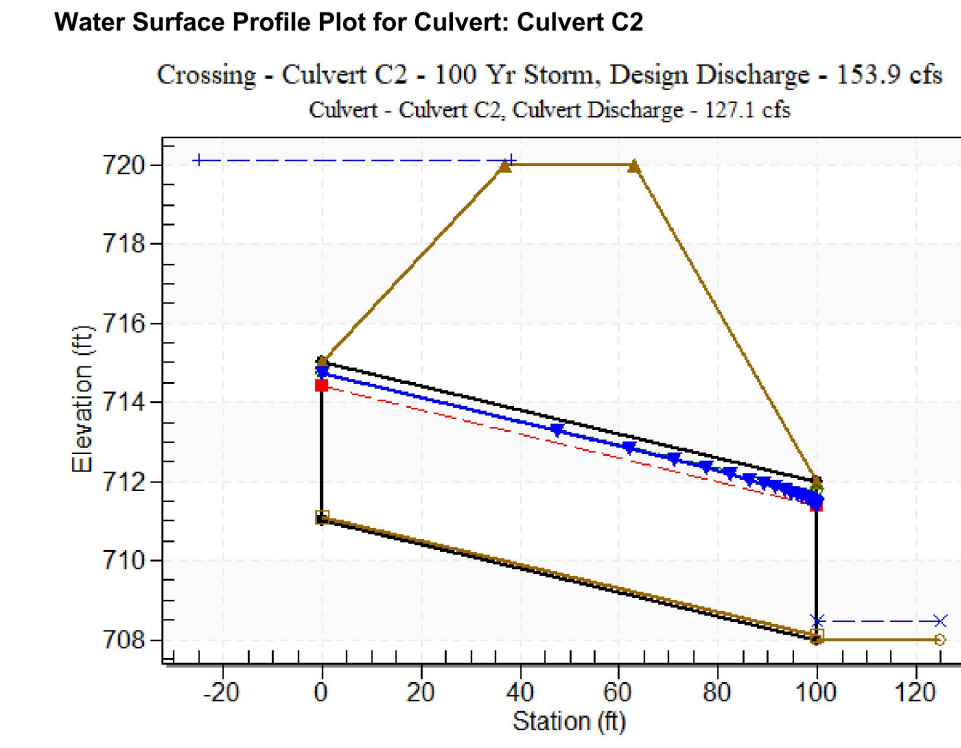
**Site Data - Culvert C2**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 711.00 ft  
 Outlet Station: 100.00 ft  
 Outlet Elevation: 708.00 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert C2 - 25 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 81.00 ft  
 Channel Slope: 0.0200  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 708.00 ft

**Roadway Data for Crossing: Culvert C2 - 25 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 175.00 ft  
 Crest Elevation: 720.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C2**  
 Barrel Shape: Circular  
 Barrel Diameter: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge with Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



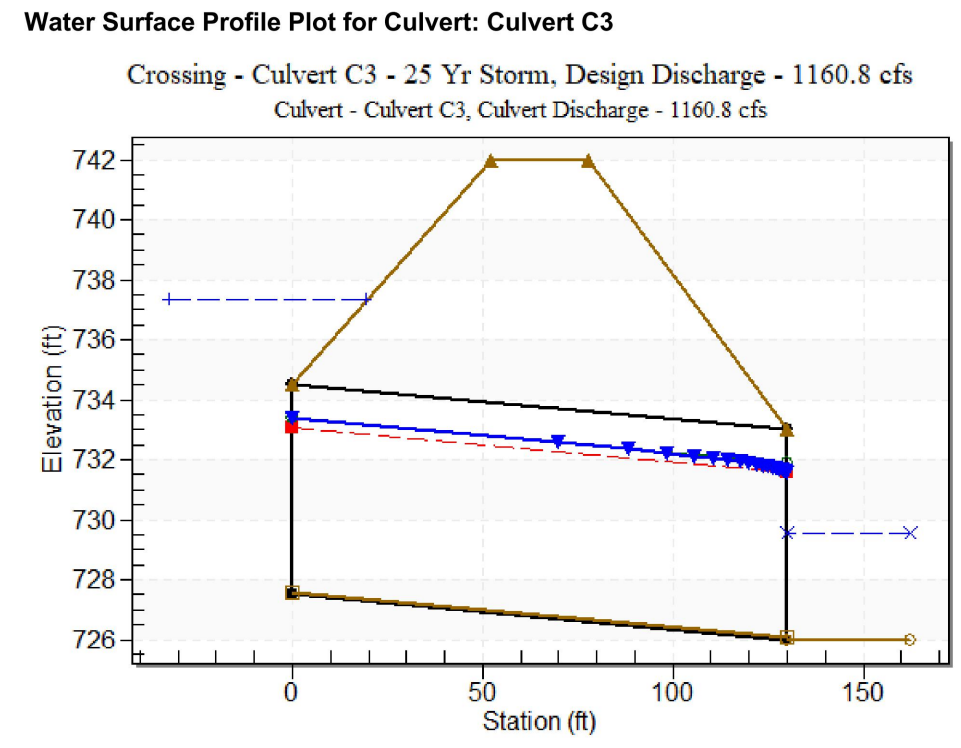
**Site Data - Culvert C2**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 711.00 ft  
 Outlet Station: 100.00 ft  
 Outlet Elevation: 708.00 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert C2 - 100 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 81.00 ft  
 Channel Slope: 0.0200  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 708.00 ft

**Roadway Data for Crossing: Culvert C2 - 100 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 175.00 ft  
 Crest Elevation: 720.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C2**  
 Barrel Shape: Circular  
 Barrel Diameter: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge with Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



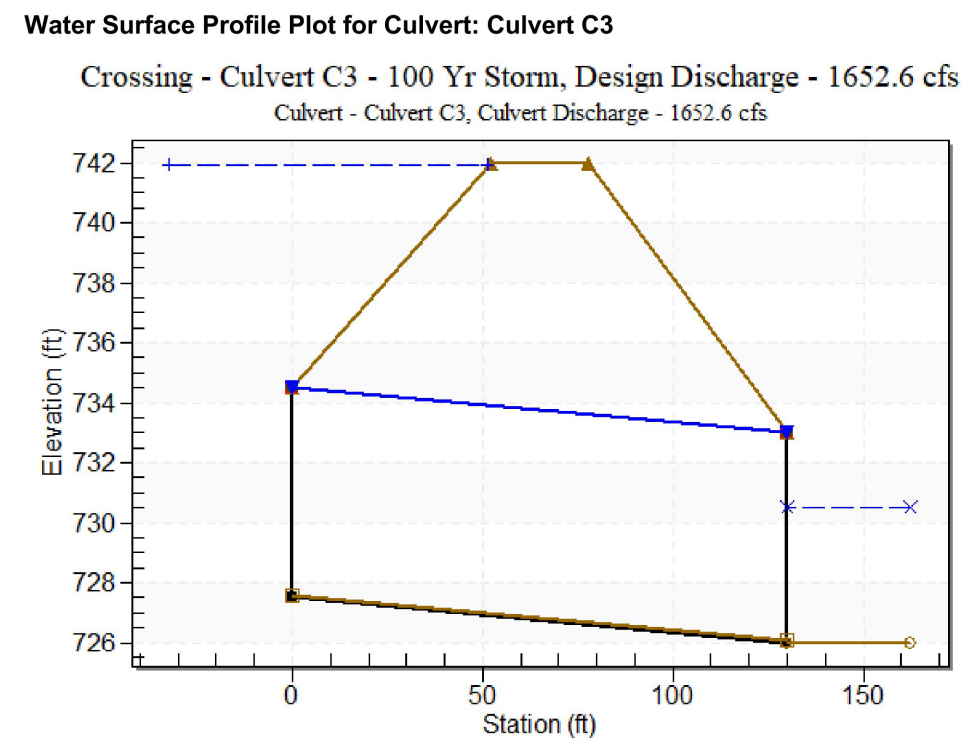
**Site Data - Culvert C3**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 727.50 ft  
 Outlet Station: 130.00 ft  
 Outlet Elevation: 726.00 ft  
 Number of Barrels: 2

**Tailwater Channel Data - Culvert C3 - 25 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 20.00 ft  
 Channel Slope: 0.0300  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 726.00 ft

**Roadway Data for Crossing: Culvert C3 - 25 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 110.00 ft  
 Crest Elevation: 742.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C3**  
 Barrel Shape: Concrete Box  
 Barrel Span: 8.00 ft  
 Barrel Rise: 7.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



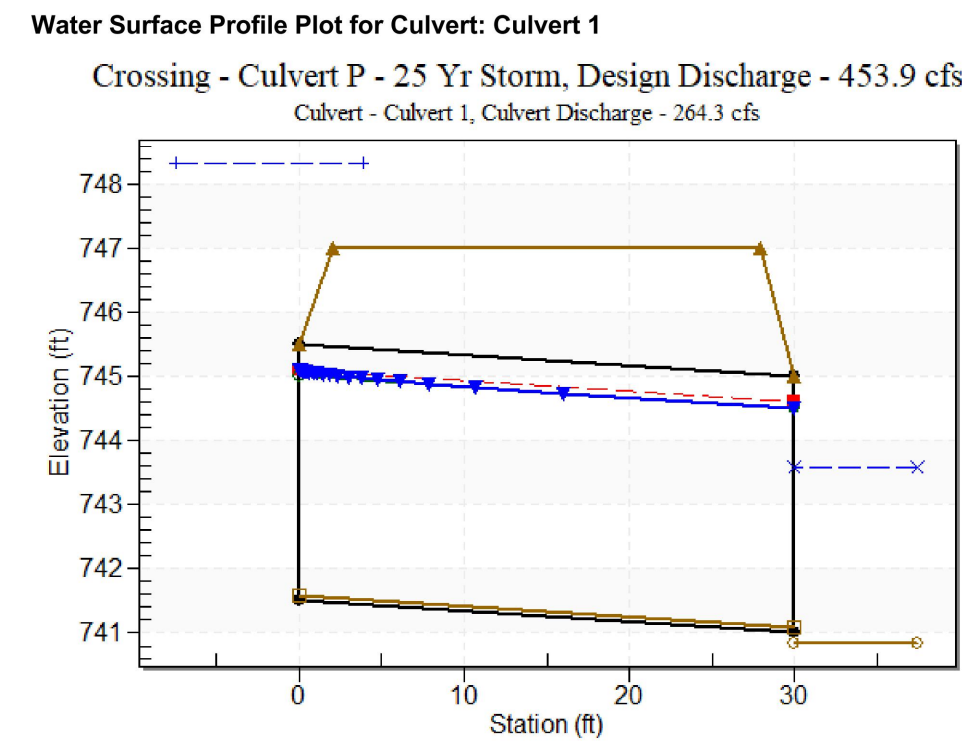
**Site Data - Culvert C3**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 727.50 ft  
 Outlet Station: 130.00 ft  
 Outlet Elevation: 726.00 ft  
 Number of Barrels: 2

**Tailwater Channel Data - Culvert C3 - 100 Yr Storm**  
 Tailwater Channel Option: Rectangular Channel  
 Bottom Width: 20.00 ft  
 Channel Slope: 0.0300  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 726.00 ft

**Roadway Data for Crossing: Culvert C3 - 100 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 110.00 ft  
 Crest Elevation: 742.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert C3**  
 Barrel Shape: Concrete Box  
 Barrel Span: 8.00 ft  
 Barrel Rise: 7.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



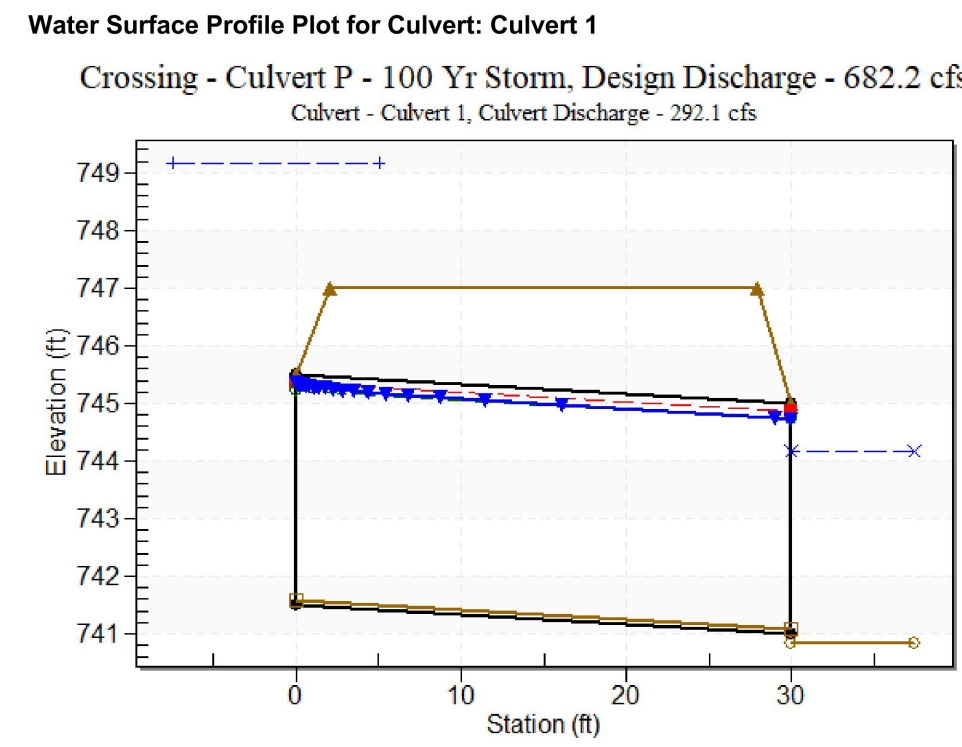
**Site Data - Culvert P**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 741.50 ft  
 Outlet Station: 30.00 ft  
 Outlet Elevation: 741.00 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert P - 25 Yr Storm**  
 Tailwater Channel Option: Trapezoidal Channel  
 Bottom Width: 7.00 ft  
 Side Slope (H:V): 3.00 (:1)  
 Channel Slope: 0.0233  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 740.85 ft

**Roadway Data for Crossing: Culvert P - 25 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 40.00 ft  
 Crest Elevation: 747.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert P**  
 Barrel Shape: Concrete Box  
 Barrel Span: 7.00 ft  
 Barrel Rise: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



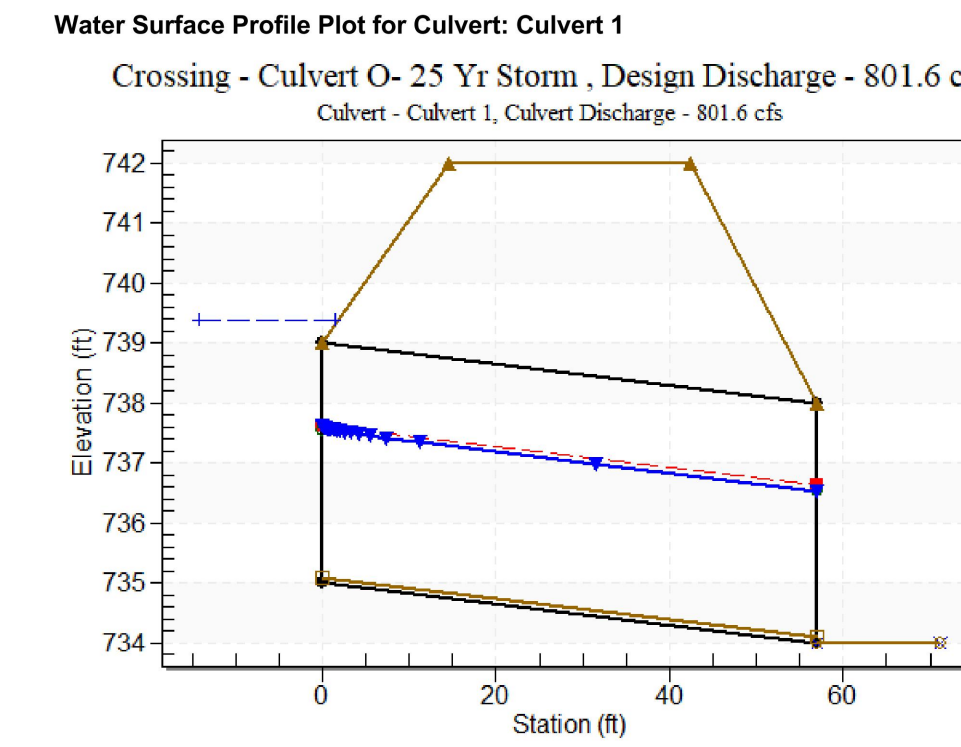
**Site Data - Culvert P**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 741.50 ft  
 Outlet Station: 30.00 ft  
 Outlet Elevation: 741.00 ft  
 Number of Barrels: 1

**Tailwater Channel Data - Culvert P - 100 Yr Storm**  
 Tailwater Channel Option: Trapezoidal Channel  
 Bottom Width: 7.00 ft  
 Side Slope (H:V): 3.00 (:1)  
 Channel Slope: 0.0233  
 Channel Manning's n: 0.0300  
 Channel Invert Elevation: 740.85 ft

**Roadway Data for Crossing: Culvert P - 100 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 40.00 ft  
 Crest Elevation: 747.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 26.00 ft

**Culvert Data Summary - Culvert P**  
 Barrel Shape: Concrete Box  
 Barrel Span: 7.00 ft  
 Barrel Rise: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



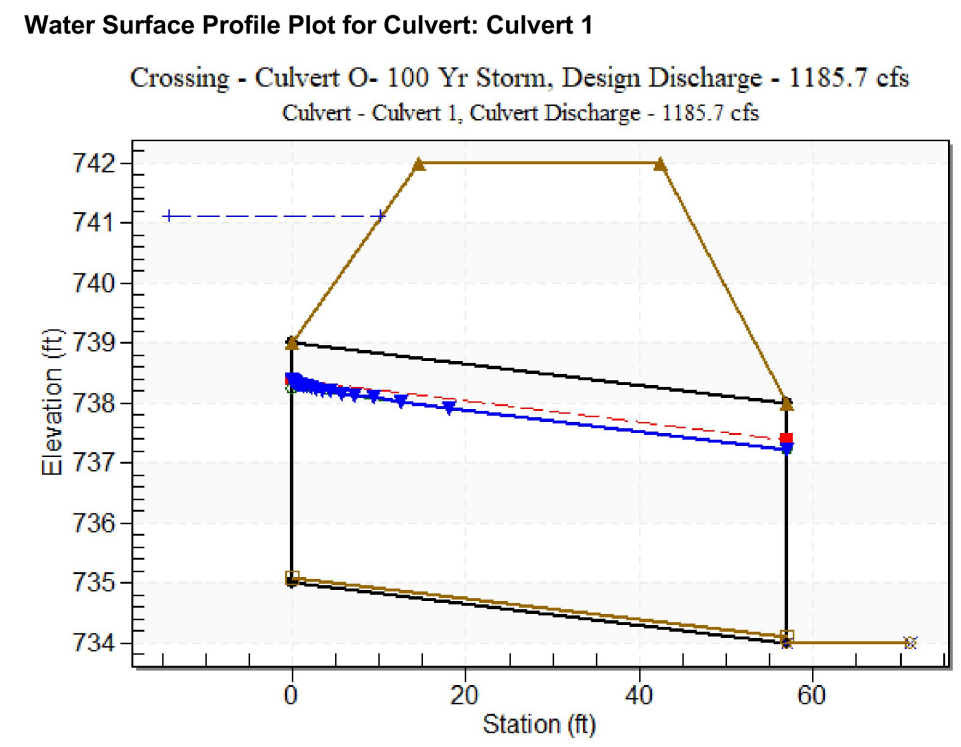
**Site Data - Culvert O**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 735.00 ft  
 Outlet Station: 57.00 ft  
 Outlet Elevation: 734.00 ft  
 Number of Barrels: 5

**Tailwater Channel Data - Culvert O - 25 Yr Storm**  
 Tailwater Channel Option: Enter Constant Tailwater Elevation  
 Constant Tailwater Elevation: 734.00 ft

**Roadway Data for Crossing: Culvert O - 25 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 150.00 ft  
 Crest Elevation: 742.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 28.00 ft

**Culvert Data Summary - Culvert O**  
 Barrel Shape: Concrete Box  
 Barrel Span: 7.00 ft  
 Barrel Rise: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

HY-8 Culvert Analysis Report



**Site Data - Culvert O**  
 Site Data Option: Culvert Invert Data  
 Inlet Station: 0.00 ft  
 Inlet Elevation: 735.00 ft  
 Outlet Station: 57.00 ft  
 Outlet Elevation: 734.00 ft  
 Number of Barrels: 5

**Tailwater Channel Data - Culvert O - 100 Yr Storm**  
 Tailwater Channel Option: Enter Constant Tailwater Elevation  
 Constant Tailwater Elevation: 734.00 ft

**Roadway Data for Crossing: Culvert O - 100 Yr Storm**  
 Roadway Profile Shape: Constant Roadway Elevation  
 Crest Length: 150.00 ft  
 Crest Elevation: 742.00 ft  
 Roadway Surface: Paved  
 Roadway Top Width: 28.00 ft

**Culvert Data Summary - Culvert O**  
 Barrel Shape: Concrete Box  
 Barrel Span: 7.00 ft  
 Barrel Rise: 4.00 ft  
 Barrel Material: Concrete  
 Embedment: 1.00 in  
 Barrel Manning's n: 0.0120 (top and sides)  
 Manning's n: 0.0350 (bottom)  
 Culvert Type: Straight  
 Inlet Configuration: Square Edge (90°) Headwall  
 Inlet Depression: None

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NO.	REVISION	DATE

10.7.2022

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**Southwest Engineers**  
 TBPE NO. F-1909  
 www.swengineers.com

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 307 Saint Lawrence Street, Gonzales TX 78629  
 P: 830.672.7546 F: 830.672.2034

**CENTRAL TEXAS**  
 205 Cimarron Park Loop, Ste. B, Buda TX 78610  
 P: 512.312.4330

**WARNING**  
 IF THIS BAR DOES NOT MEASURE 1", THE DRAWING IS NOT TO SCALE

DRAWN BY: AL

CHECKED BY: HJ

CULVERT PROFILES

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	12 OF 36

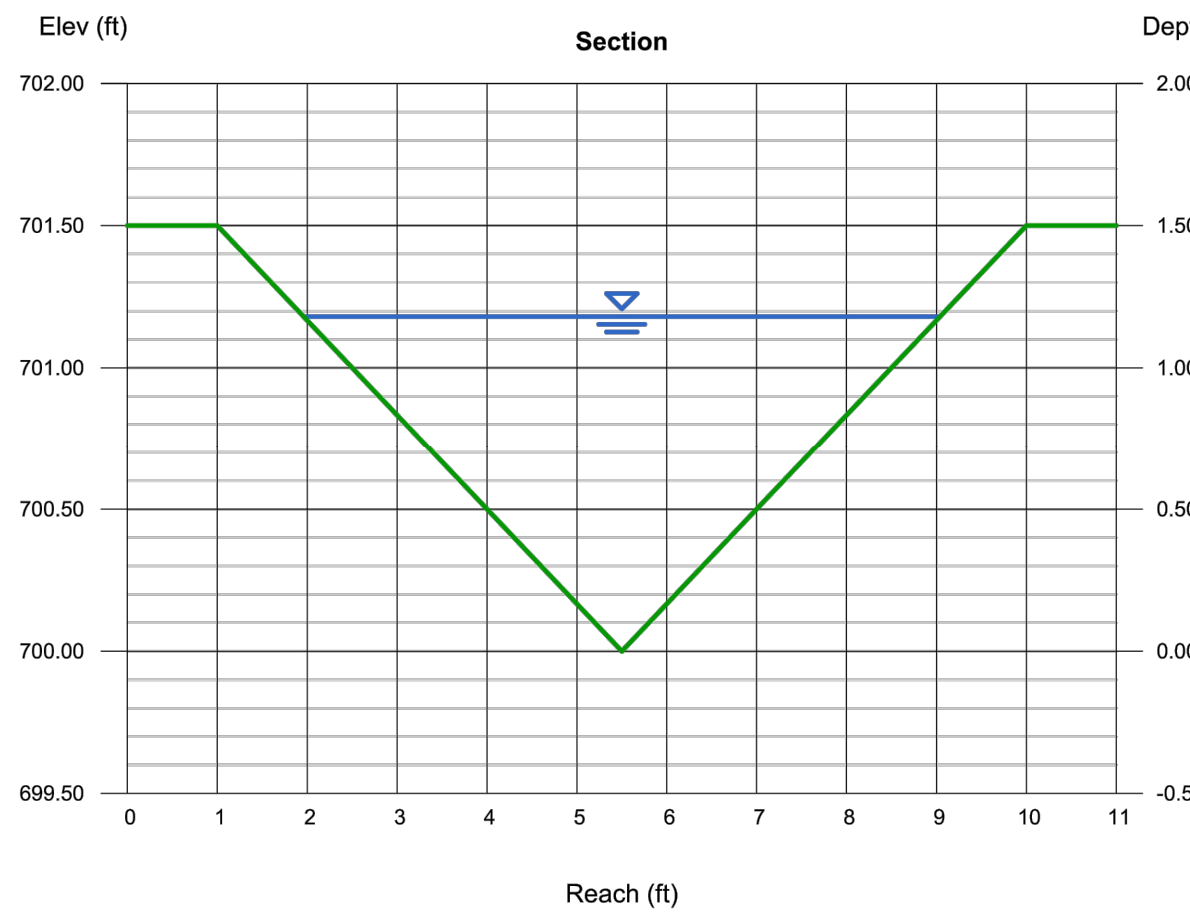


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C1-A 25-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.18
Total Depth (ft)	= 1.50	Q (cfs)	= 18.95
		Area (sqft)	= 4.18
Invert Elev (ft)	= 700.00	Velocity (ft/s)	= 4.54
Slope (%)	= 2.50	Wetted Perim (ft)	= 7.46
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.20
		Top Width (ft)	= 7.08
		EGL (ft)	= 1.50
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 18.95		

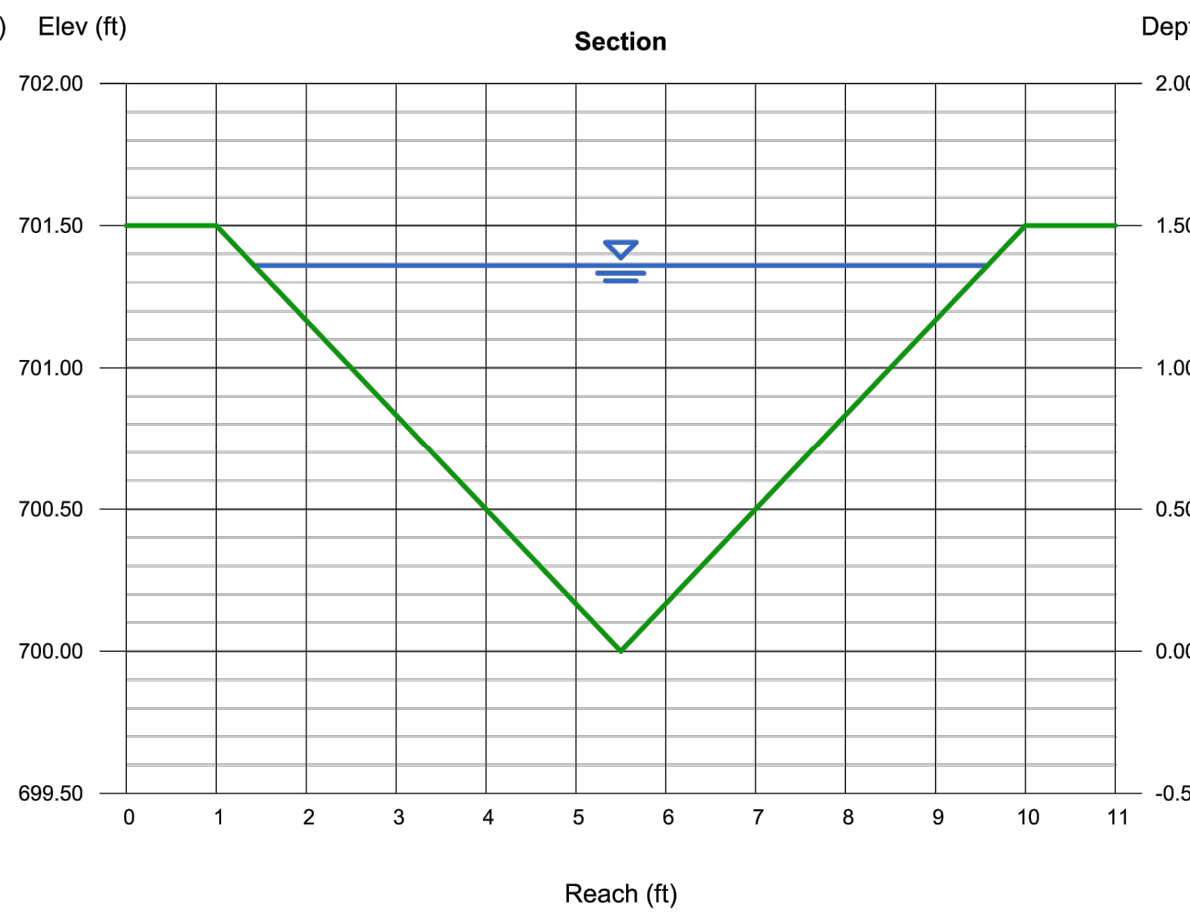


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C1-A 100-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.36
Total Depth (ft)	= 1.50	Q (cfs)	= 27.70
		Area (sqft)	= 5.55
Invert Elev (ft)	= 700.00	Velocity (ft/s)	= 4.99
Slope (%)	= 2.50	Wetted Perim (ft)	= 8.60
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.40
		Top Width (ft)	= 8.16
		EGL (ft)	= 1.75
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 27.70		

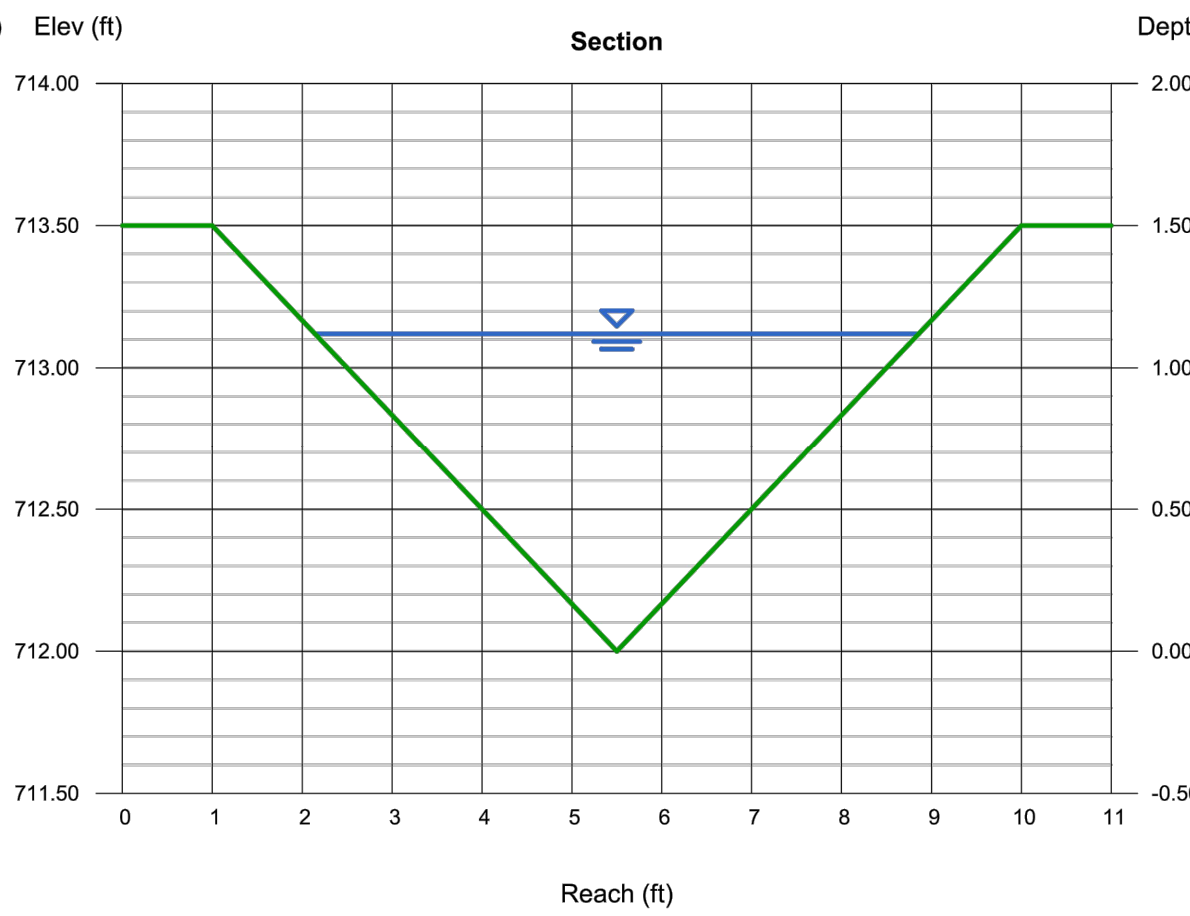


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C2-A 25-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.12
Total Depth (ft)	= 1.50	Q (cfs)	= 17.75
		Area (sqft)	= 3.76
Invert Elev (ft)	= 712.00	Velocity (ft/s)	= 4.72
Slope (%)	= 3.00	Wetted Perim (ft)	= 7.08
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.17
		Top Width (ft)	= 6.72
		EGL (ft)	= 1.47
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 17.75		

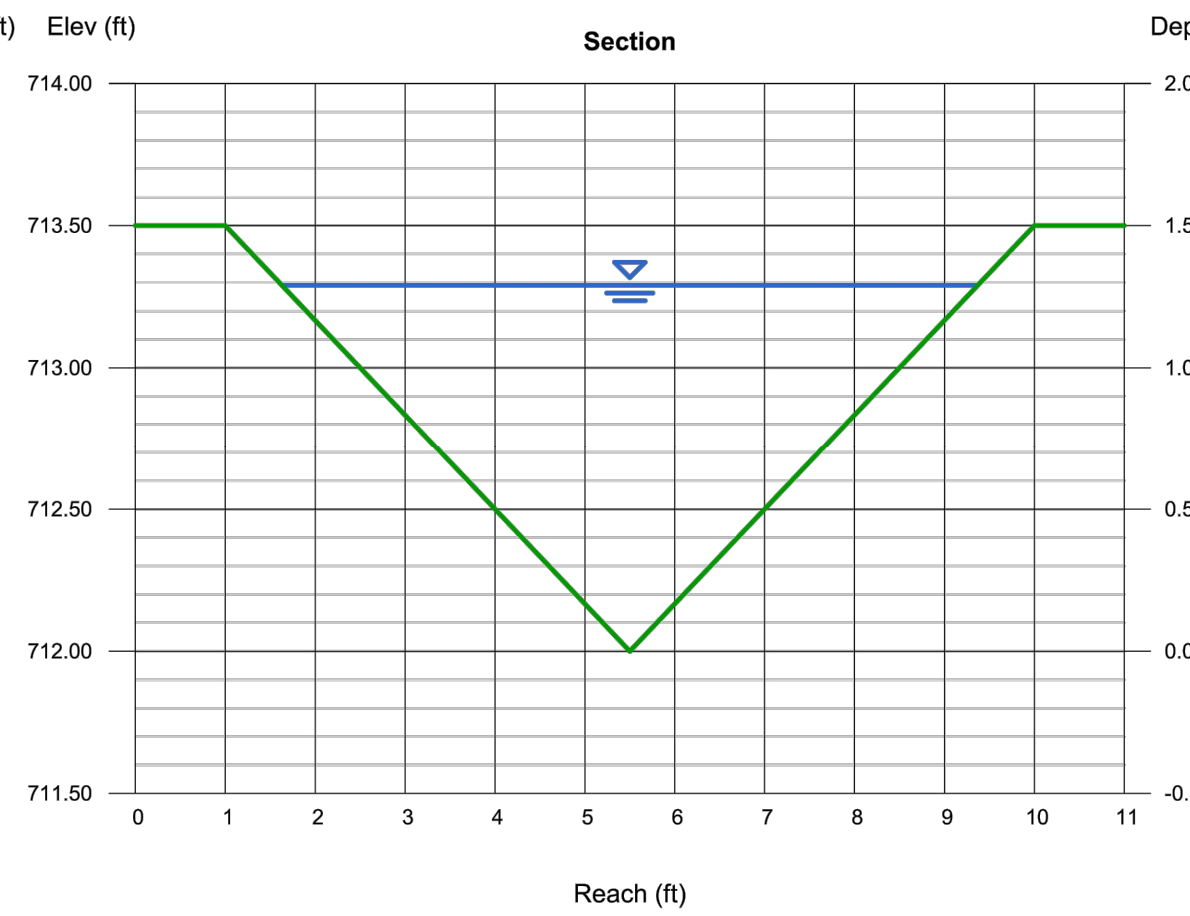


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C2-A 100-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.29
Total Depth (ft)	= 1.50	Q (cfs)	= 26.06
		Area (sqft)	= 4.99
Invert Elev (ft)	= 712.00	Velocity (ft/s)	= 5.22
Slope (%)	= 3.00	Wetted Perim (ft)	= 8.16
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.37
		Top Width (ft)	= 7.74
		EGL (ft)	= 1.71
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 26.06		

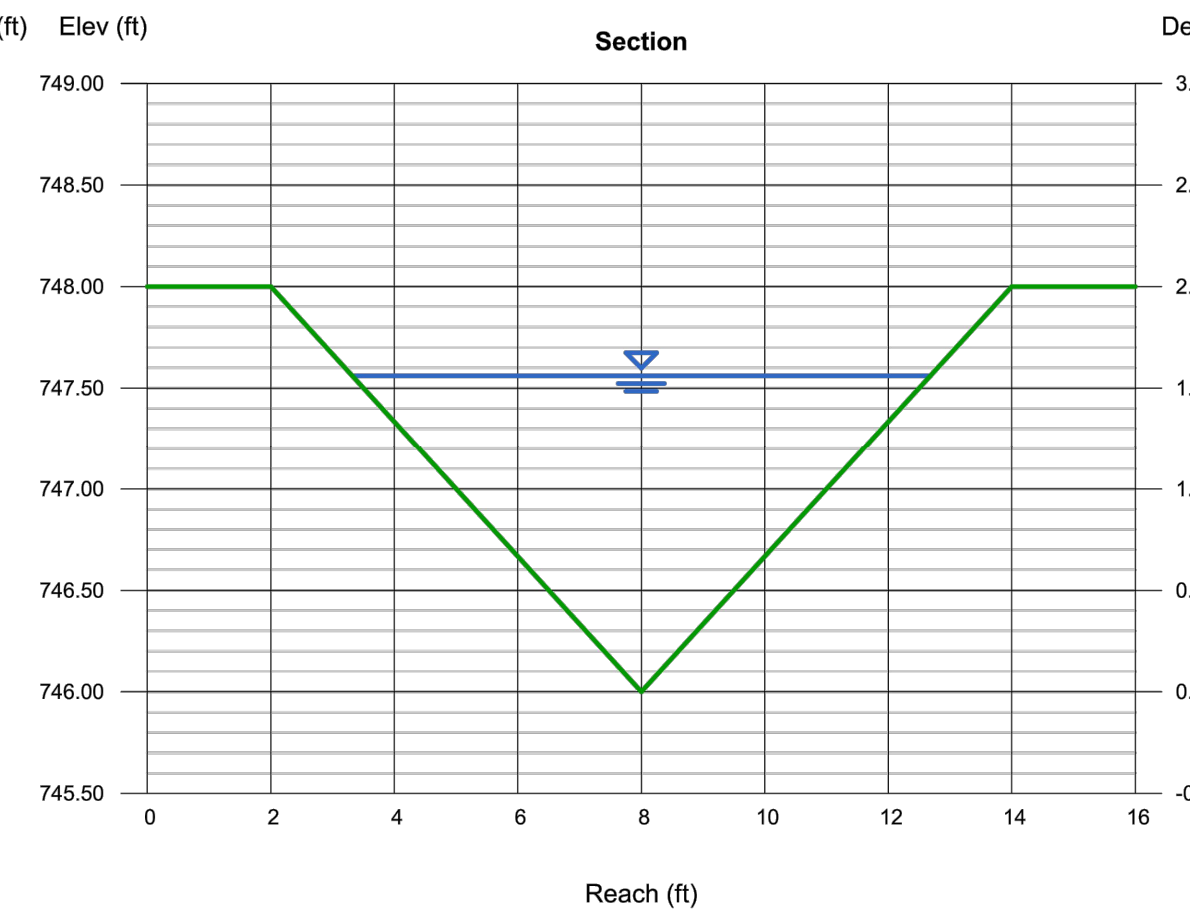


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C3-A 25-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.56
Total Depth (ft)	= 2.00	Q (cfs)	= 39.95
		Area (sqft)	= 7.30
Invert Elev (ft)	= 746.00	Velocity (ft/s)	= 5.47
Slope (%)	= 2.50	Wetted Perim (ft)	= 9.87
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.62
		Top Width (ft)	= 9.36
		EGL (ft)	= 2.03
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 39.95		

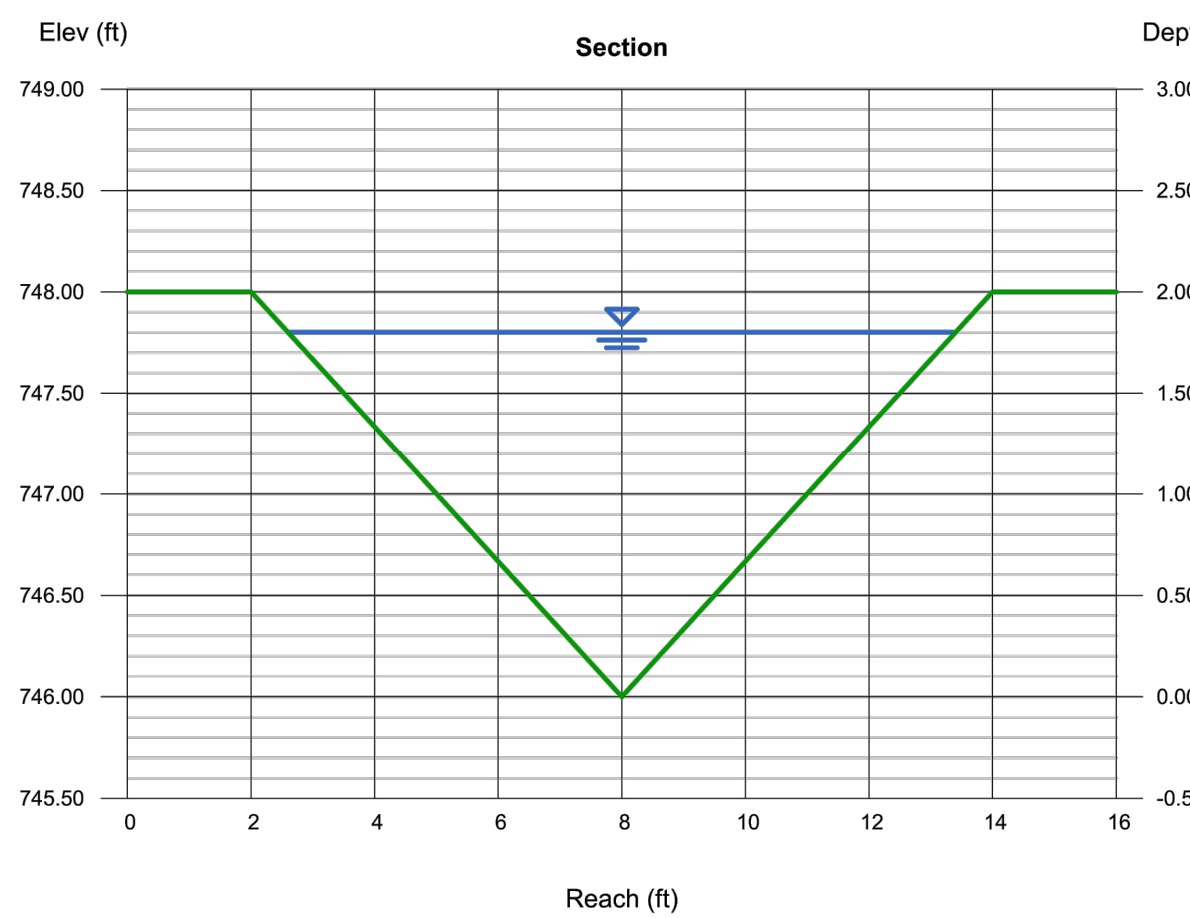


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C3-A 100-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.80
Total Depth (ft)	= 2.00	Q (cfs)	= 57.94
		Area (sqft)	= 9.72
Invert Elev (ft)	= 746.00	Velocity (ft/s)	= 5.96
Slope (%)	= 2.50	Wetted Perim (ft)	= 11.38
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.88
		Top Width (ft)	= 10.80
		EGL (ft)	= 2.35
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 57.94		

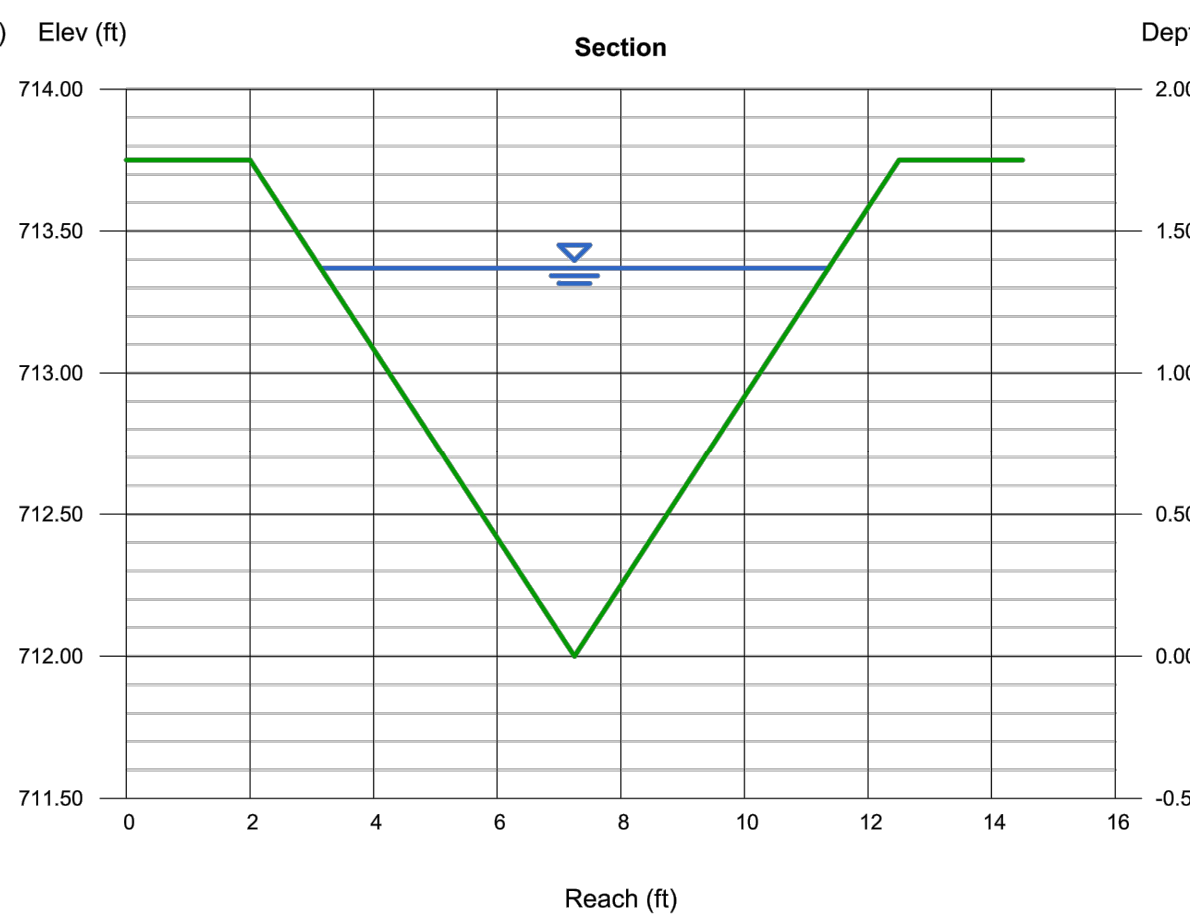


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C3-B 25-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.37
Total Depth (ft)	= 1.75	Q (cfs)	= 27.92
		Area (sqft)	= 5.63
Invert Elev (ft)	= 712.00	Velocity (ft/s)	= 4.96
Slope (%)	= 2.50	Wetted Perim (ft)	= 8.66
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.41
		Top Width (ft)	= 8.22
		EGL (ft)	= 1.75
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 27.92		

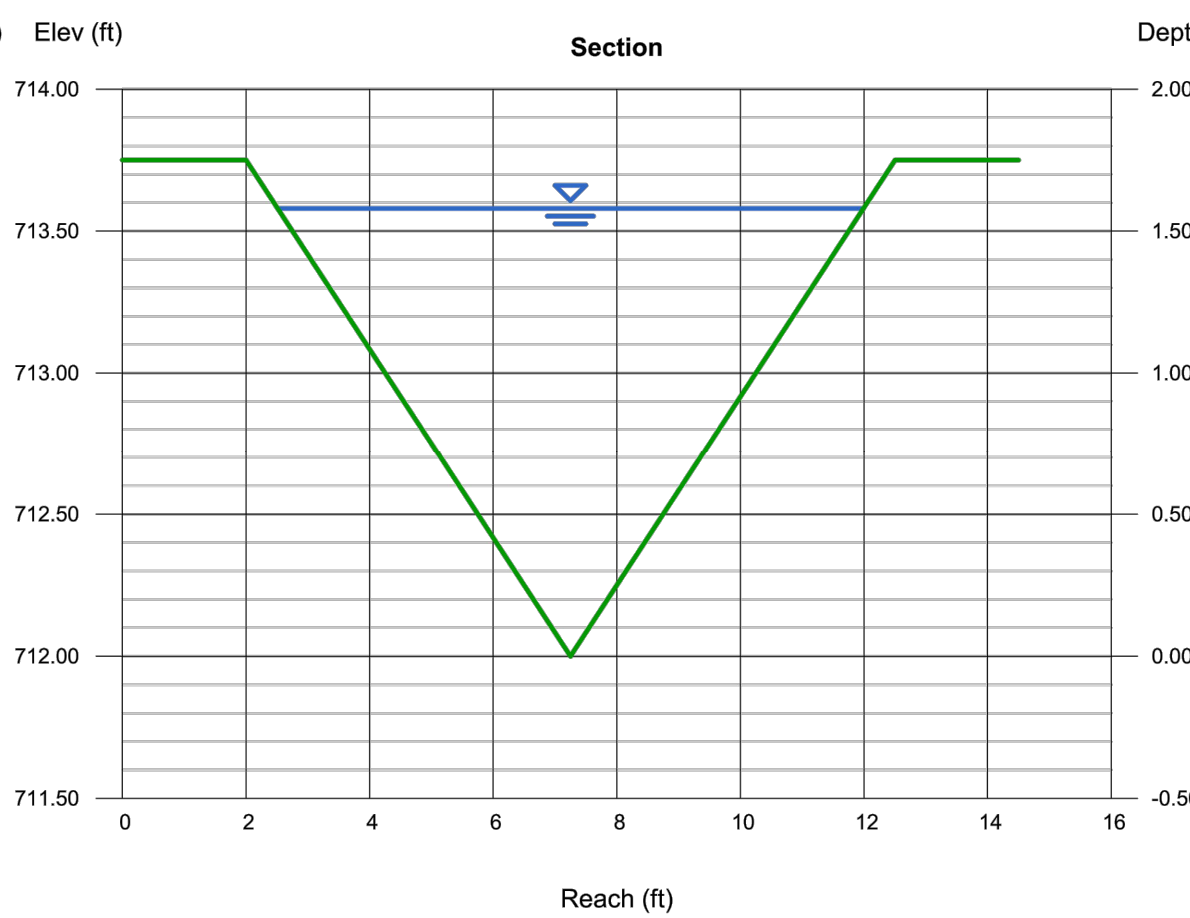


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Aug 23 2022

#### Channel C3-B 100-Year Storm

<b>Triangular</b>		<b>Highlighted</b>	
Side Slopes (z:1)	= 3.00, 3.00	Depth (ft)	= 1.58
Total Depth (ft)	= 1.75	Q (cfs)	= 40.85
		Area (sqft)	= 7.49
Invert Elev (ft)	= 712.00	Velocity (ft/s)	= 5.45
Slope (%)	= 2.50	Wetted Perim (ft)	= 9.99
N-Value	= 0.035	Crit Depth, Yc (ft)	= 1.64
		Top Width (ft)	= 9.48
		EGL (ft)	= 2.04
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 40.85		

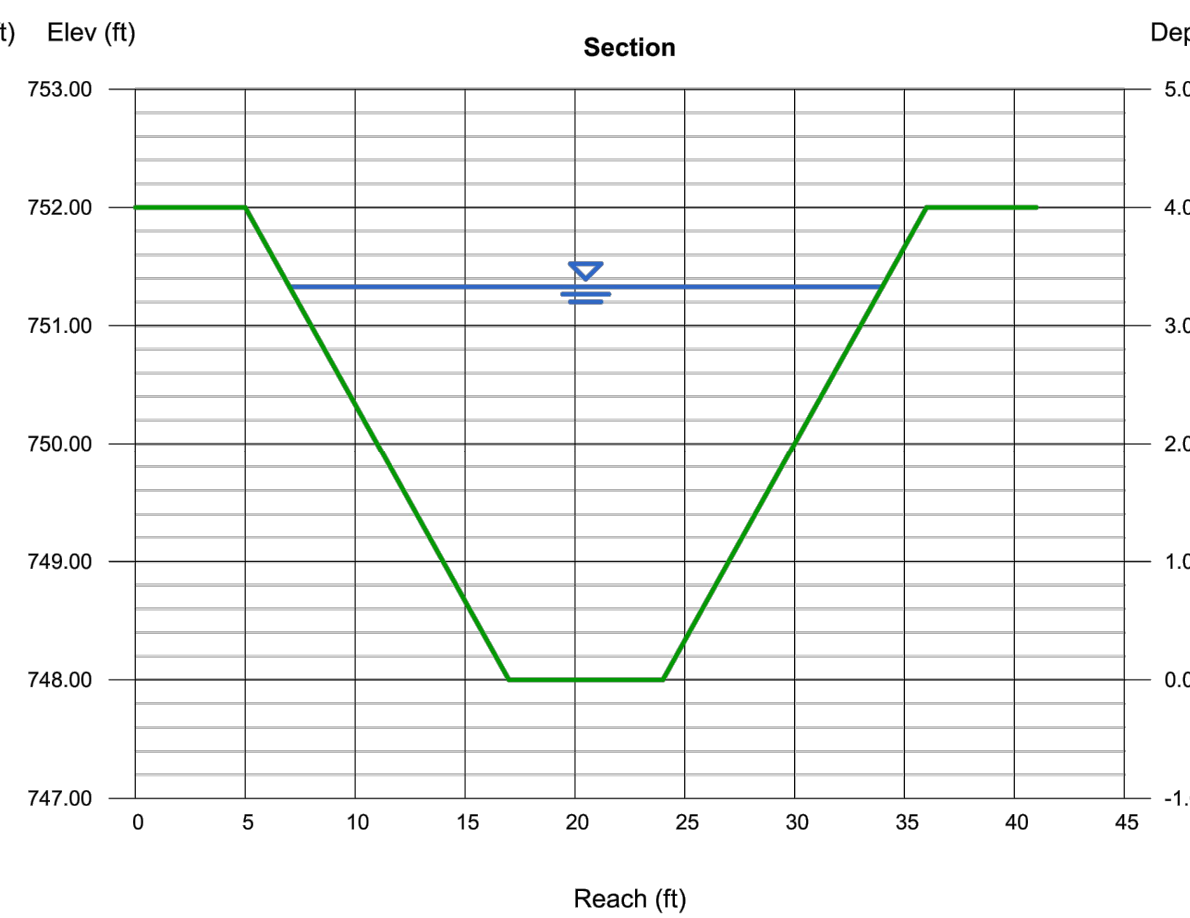


### Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Friday, Jun 24 2022

#### Channel P - 100 Year Storm Event

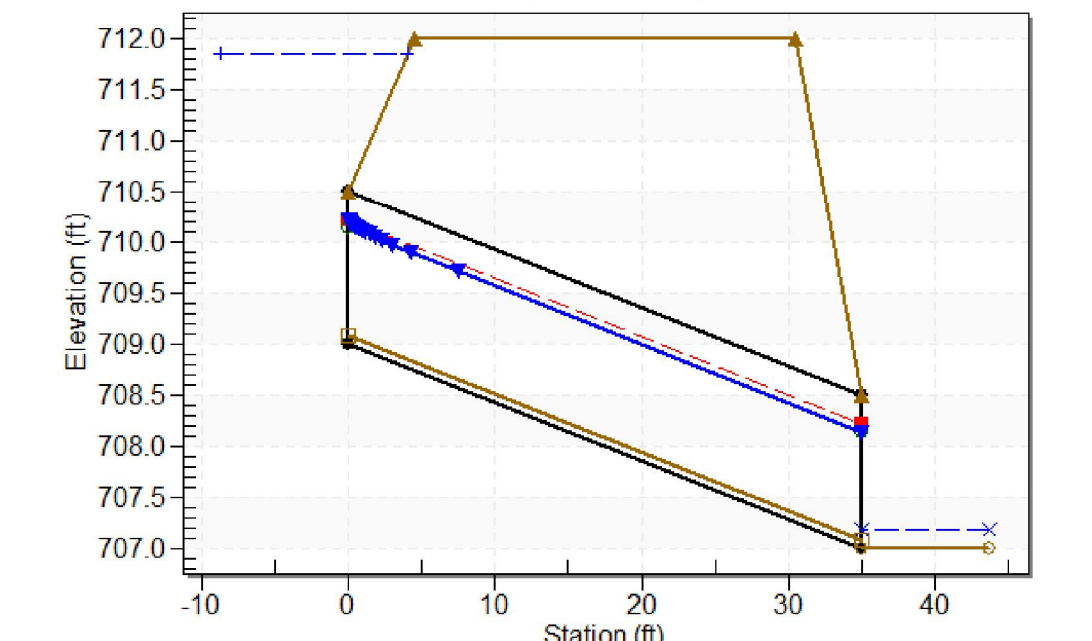
<b>Trapezoidal</b>		<b>Highlighted</b>	
Bottom Width (ft)	= 7.00	Depth (ft)	= 3.33
Side Slopes (z:1)	= 3.00, 3.00	Q (cfs)	= 682.16
Total Depth (ft)	= 4.00	Area (sqft)	= 56.58
Invert Elev (ft)	= 748.00	Velocity (ft/s)	= 12.06
Slope (%)	= 2.33	Wetted Perim (ft)	= 26.06
N-Value	= 0.030	Crit Depth, Yc (ft)	= 4.00
		Top Width (ft)	= 26.98
		EGL (ft)	= 5.59
<b>Calculations</b>			
Compute by:	Known Q		
Known Q (cfs)	= 682.16		



### HY-8 Culvert Analysis Report

#### Water Surface Profile Plot for Culvert: Culvert C1a

Crossing - Culvert C1 - 25 Yr Storm, Design Discharge - 18.9 cfs  
Culvert - Culvert C1, Culvert Discharge - 18.9 cfs



#### Site Data - Culvert C1a

Site Data Option: Culvert Invert Data  
Inlet Station: 0.00 ft  
Inlet Elevation: 709.00 ft  
Outlet Station: 35.00 ft  
Outlet Elevation: 707.00 ft  
Number of Barrels: 2

#### Tailwater Channel Data - Culvert C1a - 25 Yr Storm

Tailwater Channel Option: Rectangular Channel  
Bottom Width: 35.00 ft Channel  
Inlet Slope: 0.0400 Channel  
Manning's n: 0.0300  
Channel Invert Elevation: 707.00 ft

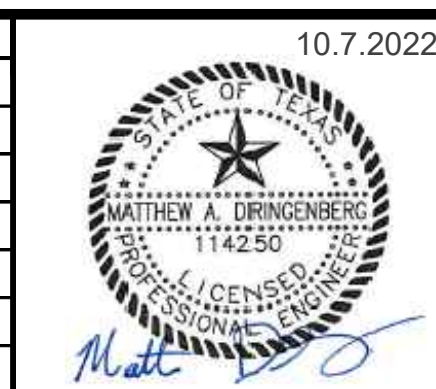
#### Culvert Data Summary - Culvert C1a

Barrel Shape: Circular  
Barrel Diameter: 1.50 ft  
Barrel Material: Concrete  
Embedment: 1.00 in  
Barrel Manning's n: 0.0120 (top and sides)  
Manning's n: 0.0350 (bottom)  
Culvert Type: Straight  
Inlet Configuration: Thin Edge Projecting Inlet  
Inlet Depression: None

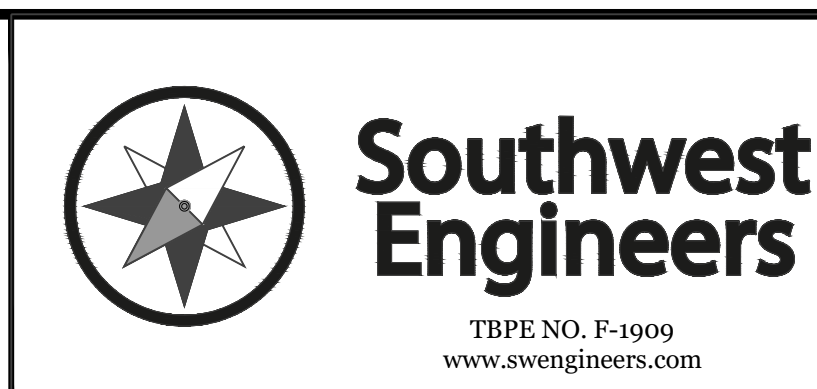
#### Roadway Data for Crossing: Culvert C1a - 25 Yr Storm

Roadway Profile Shape: Constant Roadway Elevation  
Crest Length: 35.00 ft  
Crest Elevation: 712.00 ft  
Roadway Surface: Paved  
Roadway Top Width: 26.00 ft

NO.	REVISION	DATE



10.7.2022  
THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY MATTHEW A. DRINGENBERG, P.E. #114250 ON THE DATE INDICATED. ANY ALTERATIONS OF THIS SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



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P: 830.672.7546 F: 830.672.2034  
**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4330

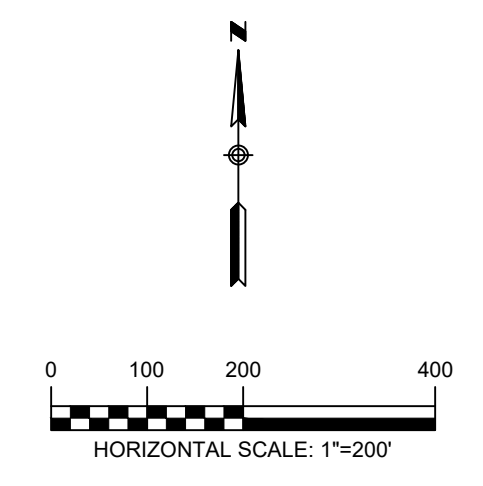
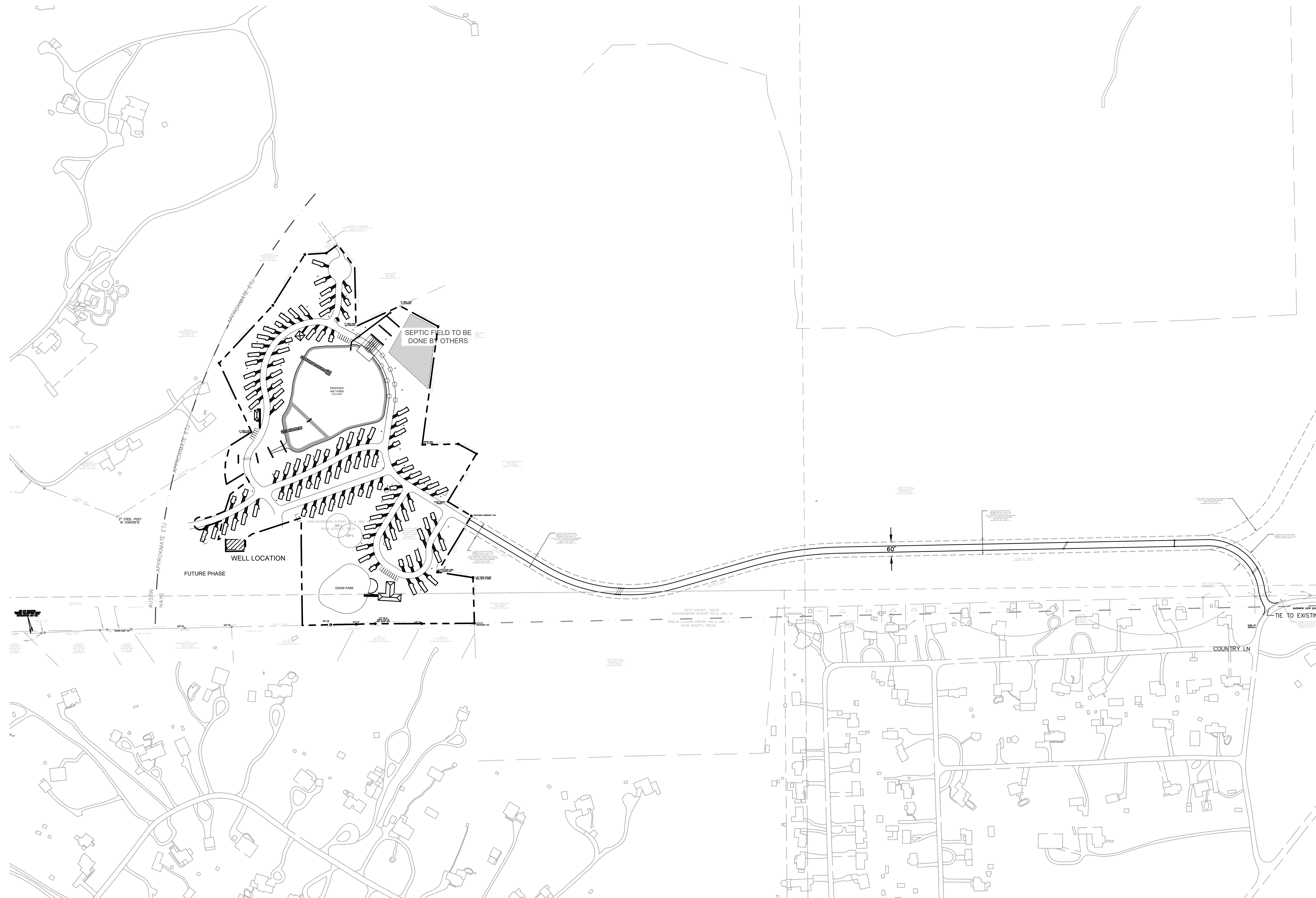
**WARNING**  
IF THIS BAR DOES NOT MEASURE 1", THE DRAWING IS NOT TO SCALE  
DRAWN BY: AL  
CHECKED BY: HJ

CULVERT PROFILES  
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001  
DRAWING NO. \_\_\_\_\_  
SHEET 12 OF 36



O:\CompanyData\Clients\0946 - James Stinson\001-20-Carpenter Hill RV Park Development\CAD [Common]\Sheets\0946-001-SITE.dwg -- Layout: "OVERALL SITE PLAN" -- Fri, Oct 07, 2022, 10:44am, By: CIG38-Jason



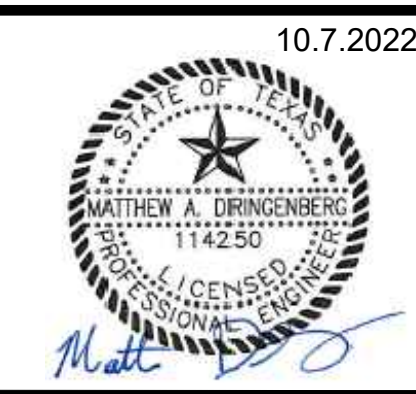
**LEGEND**

	PROPERTY BOUNDARY
	EASEMENT LINE
	FIRE LANE
	CURB AND GUTTER
	LIMITS OF CONSTRUCTION
	ACCESSIBLE ROUTE
	SIGN

**TEXAS ONE CALL SYSTEM**  
1-800-245-4545  
UNDER PENALTY OF LAW, THE CONTRACTOR IS REQUIRED TO CONTACT THE TEXAS ONE CALL SYSTEM AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

**CAUTION - ELECTRICITY PRESENT**  
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307 Saint Lawrence Street, Gonzales TX 78629  
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**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4330

**WARNING**  
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DRAWN BY: AL

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OVERALL SITE PLAN

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

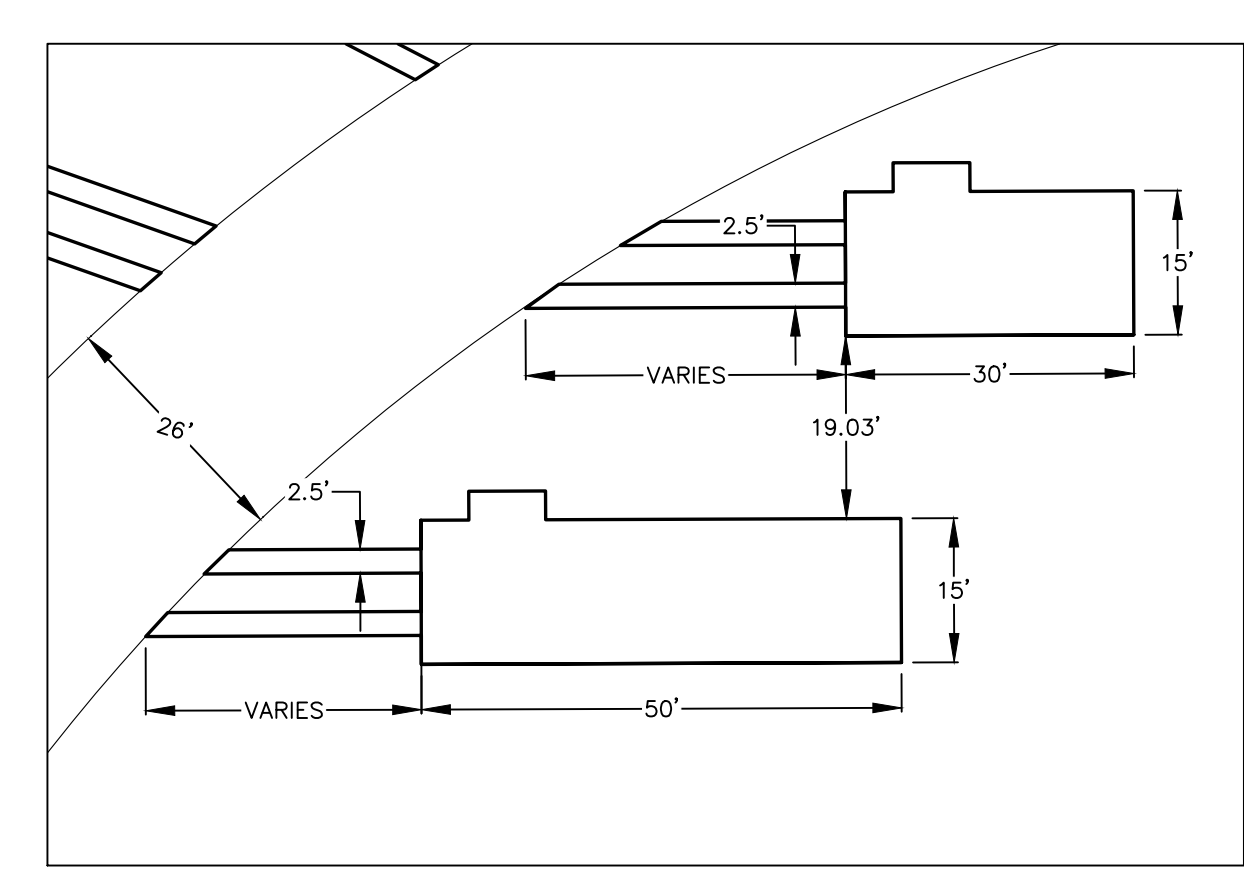
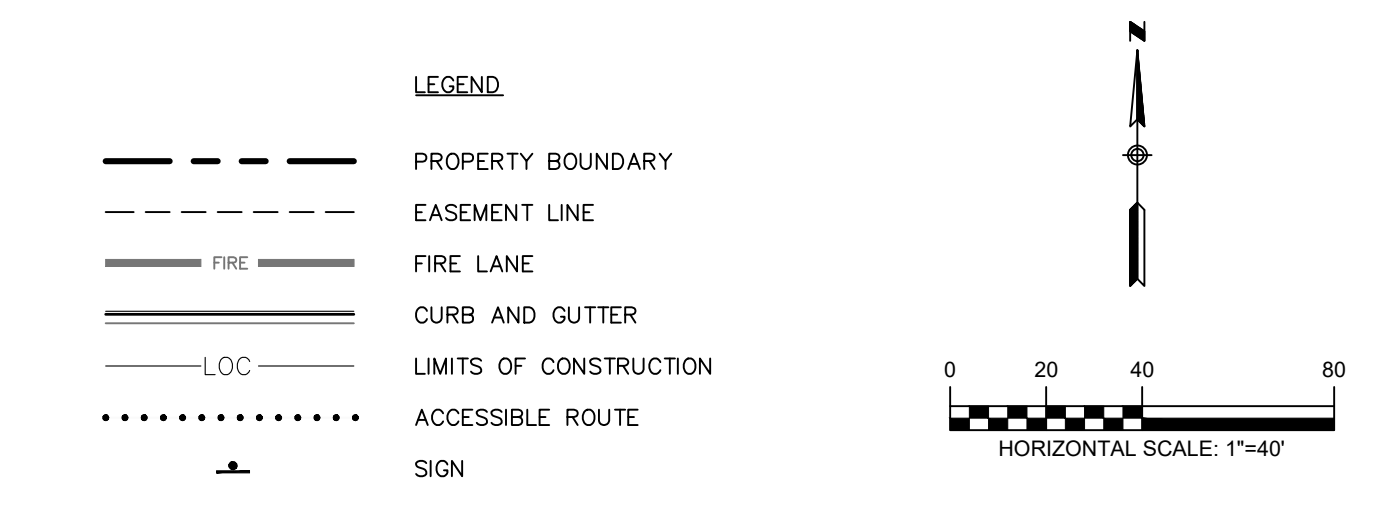
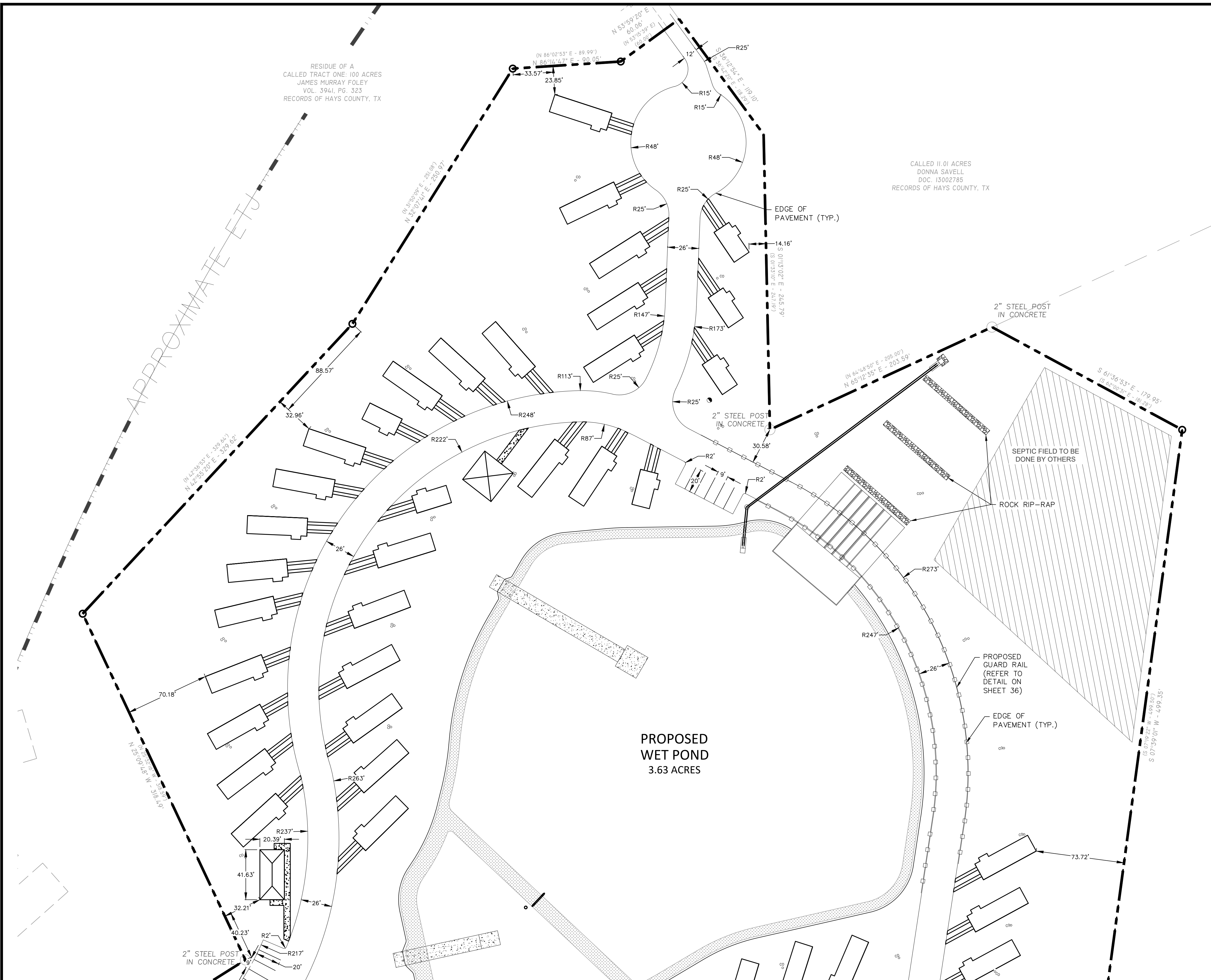
PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 14 OF 36




O:\CompanyData\Clients\0946 - James Sullivan\09-20-Carpenter Hill RV Park Development\CAD [Common]\Sheets\0946-001-SITE.dwg - Layout: "SITE AND DIMENSION CONTROL PLAN (1 OF 5)" - Fri, Oct 07, 2022, 10:45am, By: C1038\_jeasch



TYPICAL PAD LAYOUTS  
1"=20'

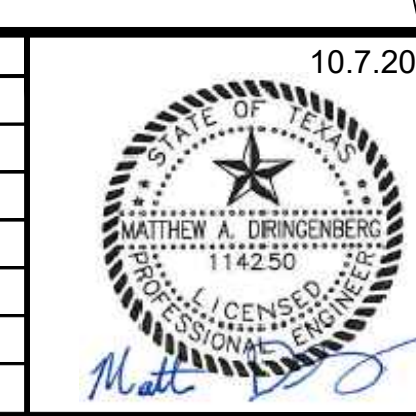


KEY MAP  
1"=400'

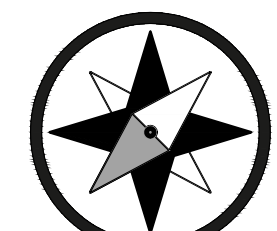

**TEXAS ONE CALL SYSTEM**  
 1-800-245-4545  
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**CENTRAL TEXAS**  
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 P: 512.312.4330

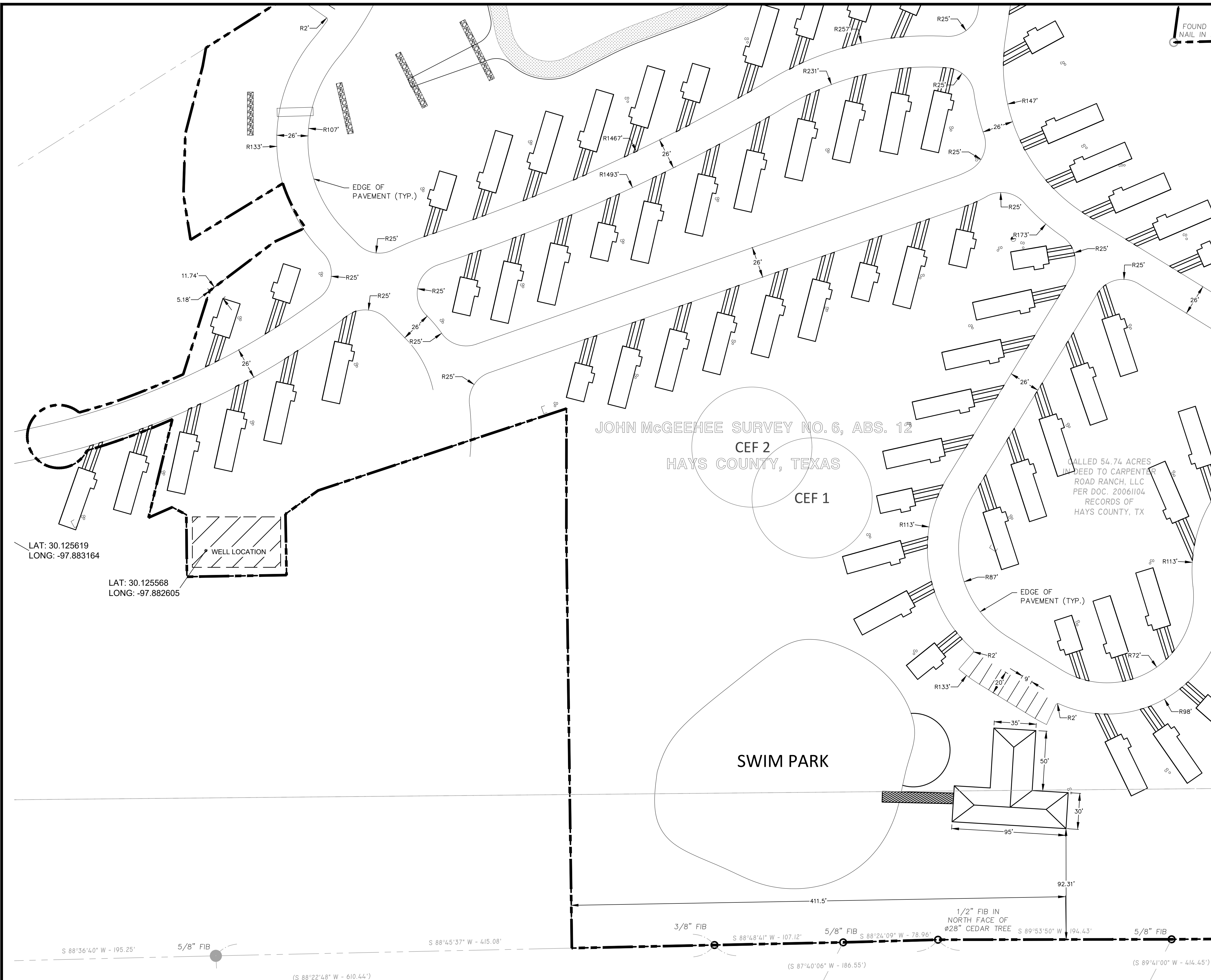
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 DRAWN BY: AL  
 CHECKED BY: HJ

SITE AND DIMENSION CONTROL PLAN (1 OF 5)  
**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001  
 DRAWING NO. \_\_\_\_\_  
 SHEET 15 OF 36



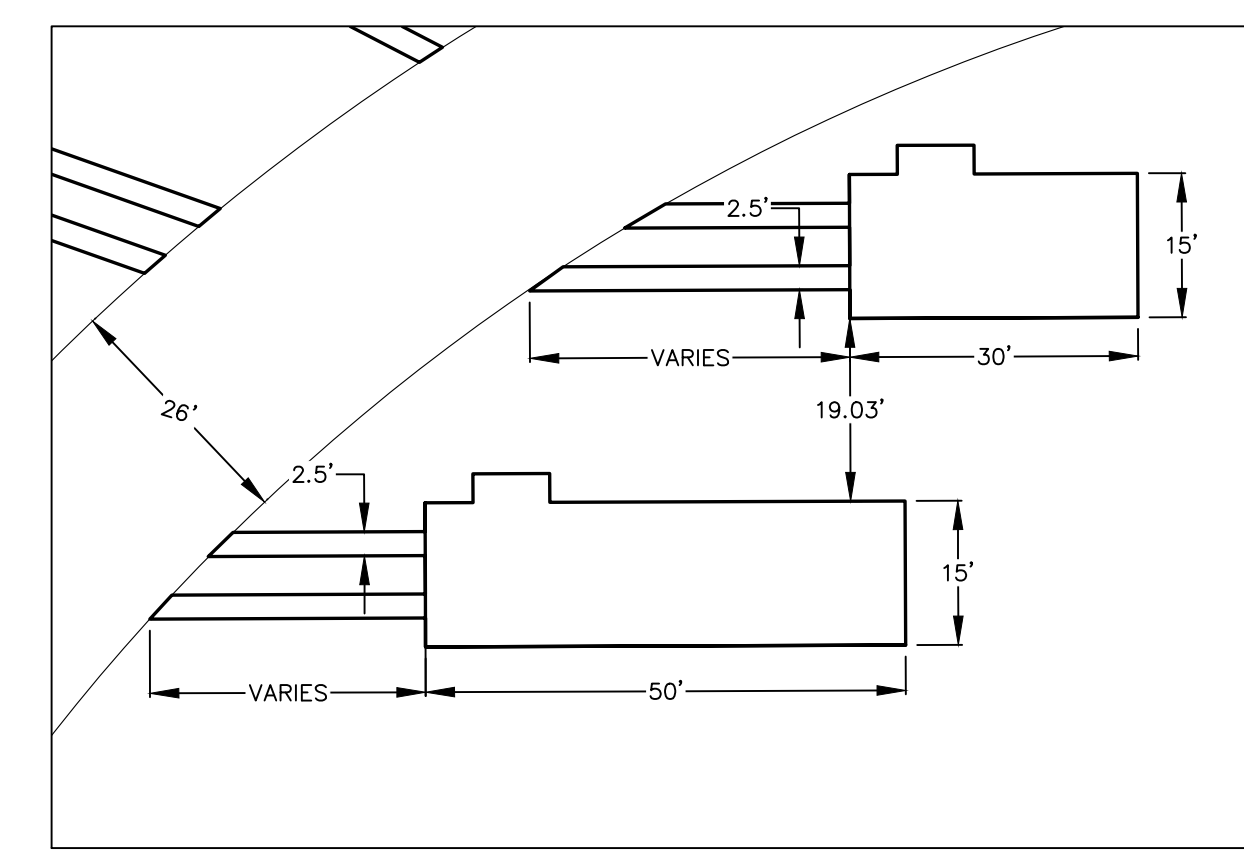
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**LEGEND**

- PROPERTY BOUNDARY
- EASEMENT LINE
- FIRE LANE
- CURB AND GUTTER
- LIMITS OF CONSTRUCTION
- ACCESSIBLE ROUTE
- SIGN

HORIZONTAL SCALE: 1"=40'



JOHN MCGEEHEE SURVEY NO. 6, ABS. 12

CEF 2  
HAYS COUNTY, TEXAS

CEF 1

CALLED 54.74 ACRES  
IN DEED TO CARPENTER  
RANCH, LLC  
PER DOC. 20061104  
RECORDS OF  
HAYS COUNTY, TX

SWIM PARK

TEXAS ONE CALL SYSTEM  
1-800-245-4545

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P: 512.312.4330

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CHECKED BY: HJ

SITE AND DIMENSION CONTROL PLAN (2 OF 5)

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

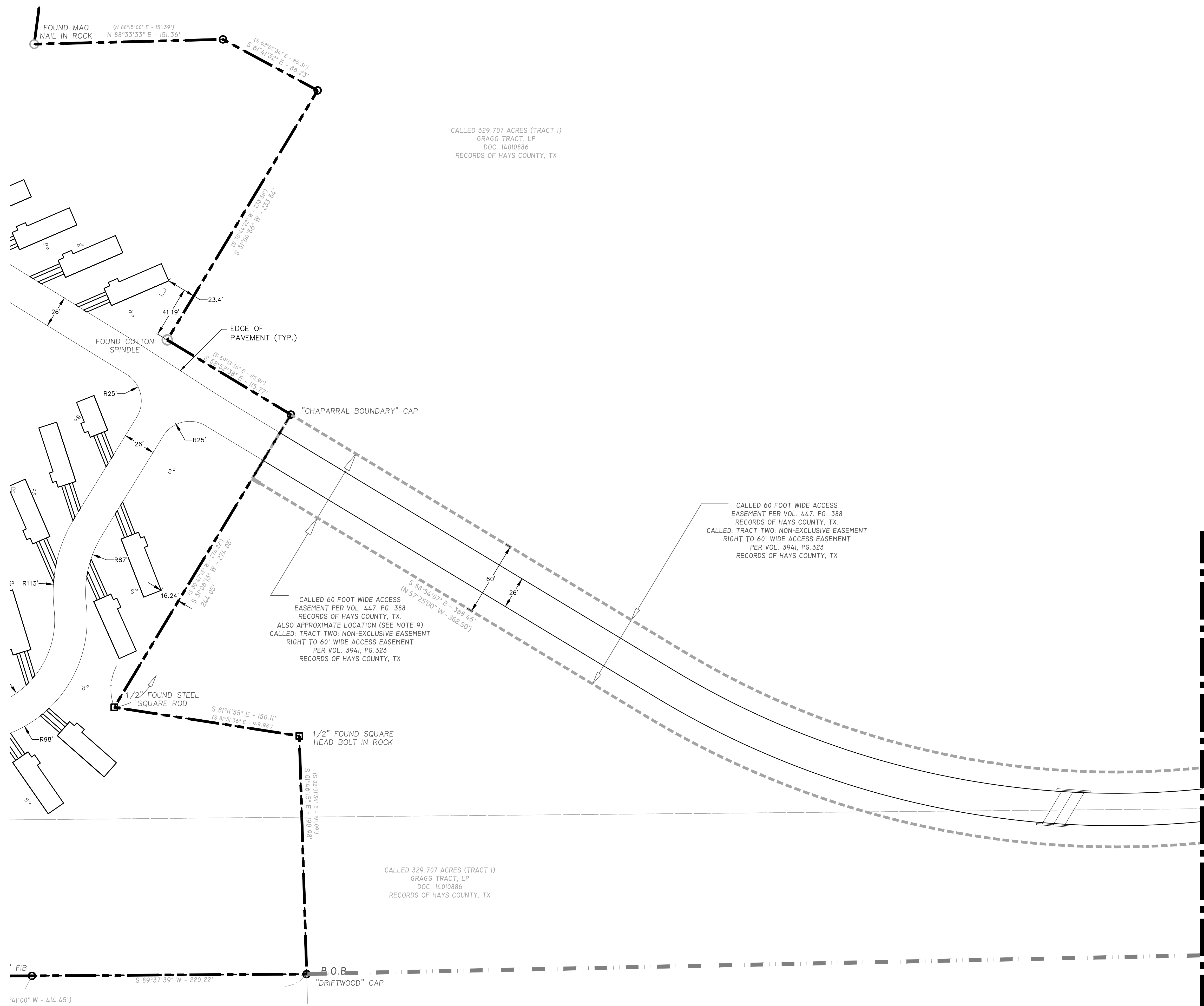
PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 16 OF 36



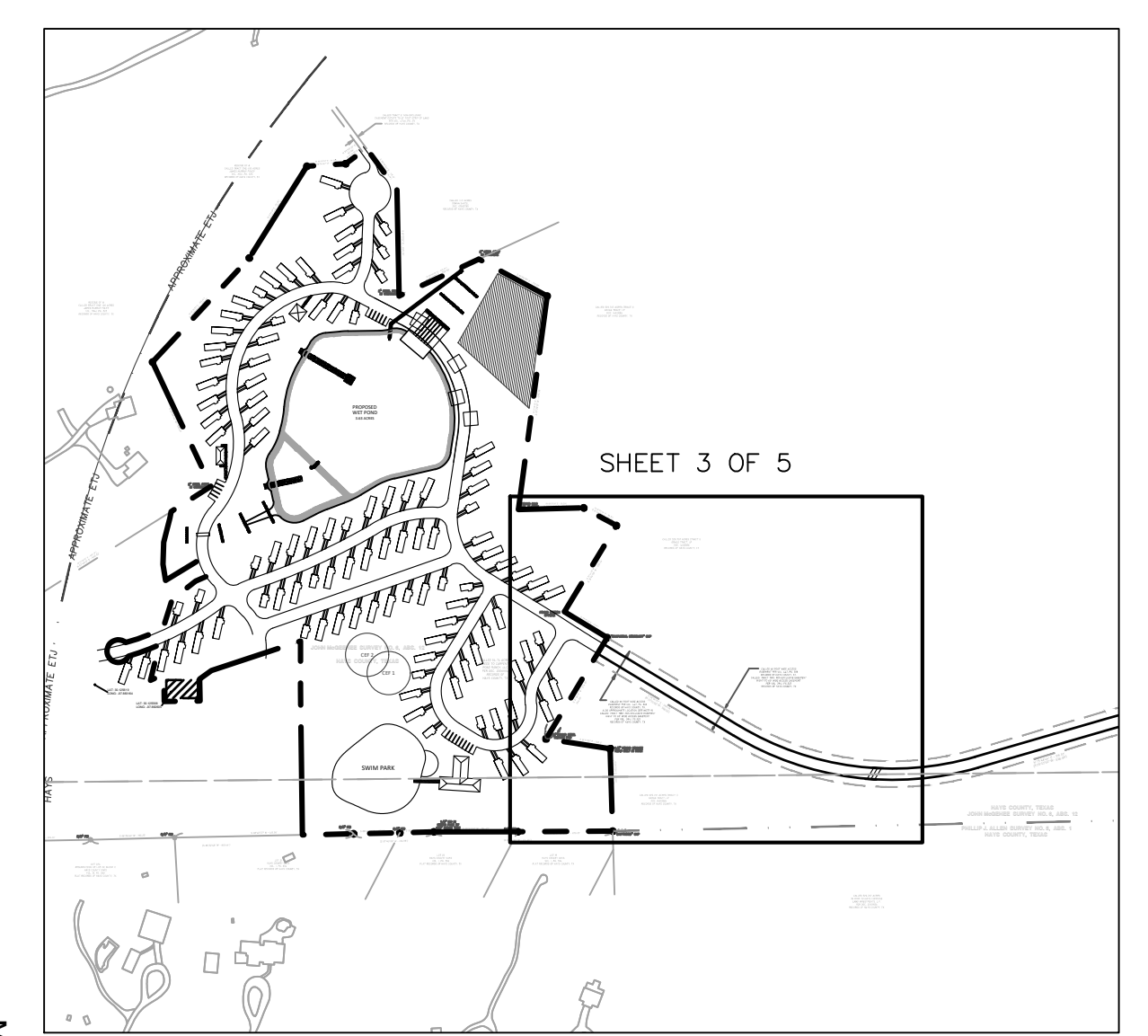
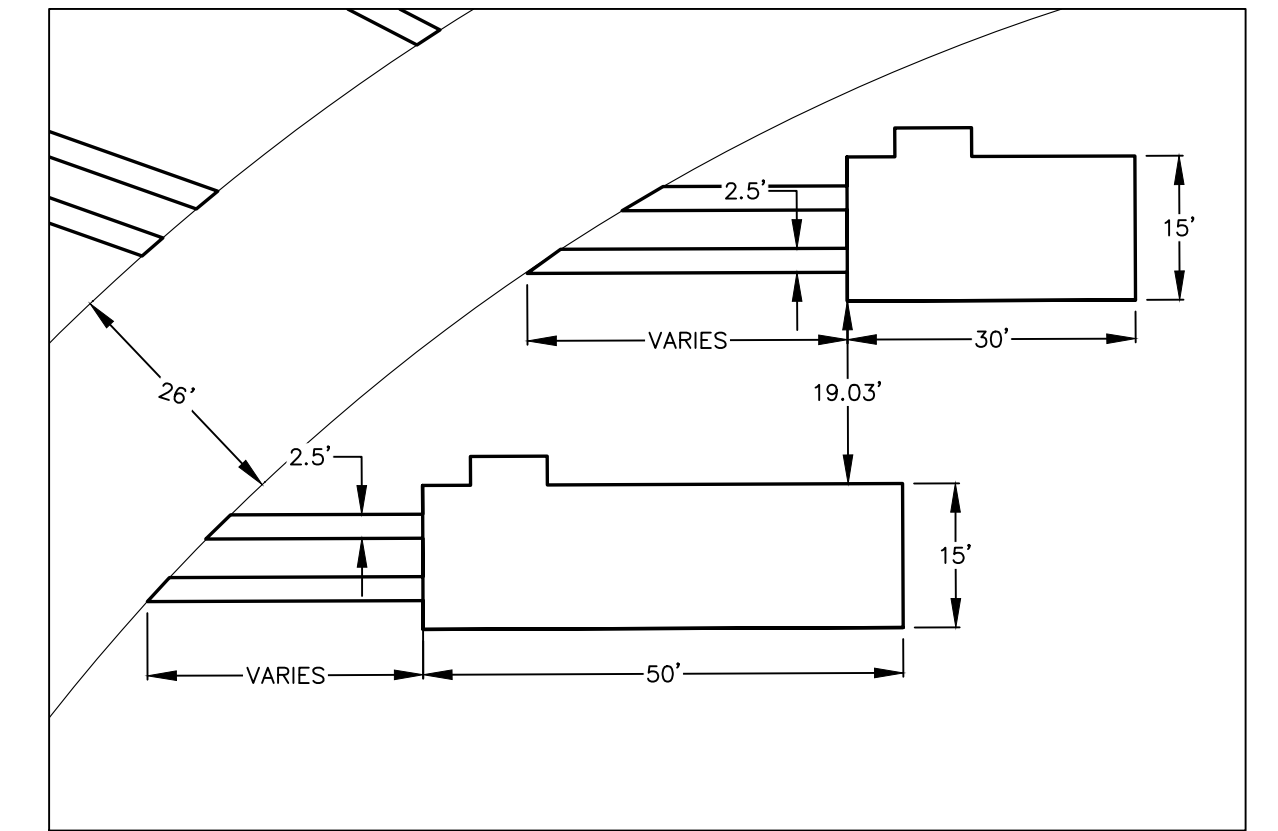
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**LEGEND**

- PROPERTY BOUNDARY
- EASEMENT LINE
- FIRE LANE
- CURB AND GUTTER
- LIMITS OF CONSTRUCTION
- ACCESSIBLE ROUTE
- SIGN

HORIZONTAL SCALE: 1"=40'



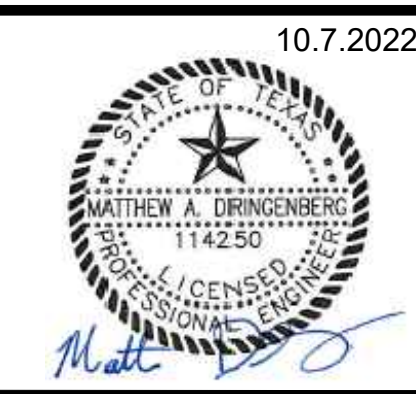
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1-800-245-4545

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P: 512.312.4330

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CHECKED BY: HJ

SITE AND DIMENSION CONTROL PLAN (3 OF 5)

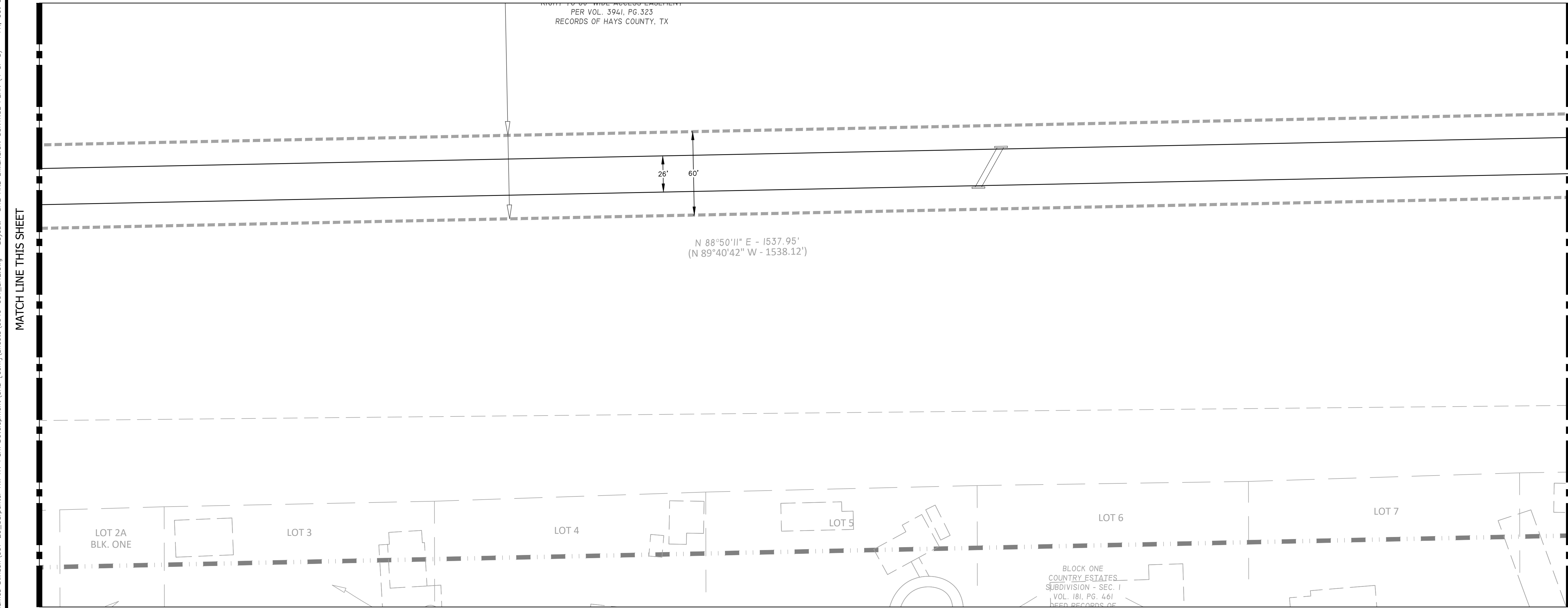
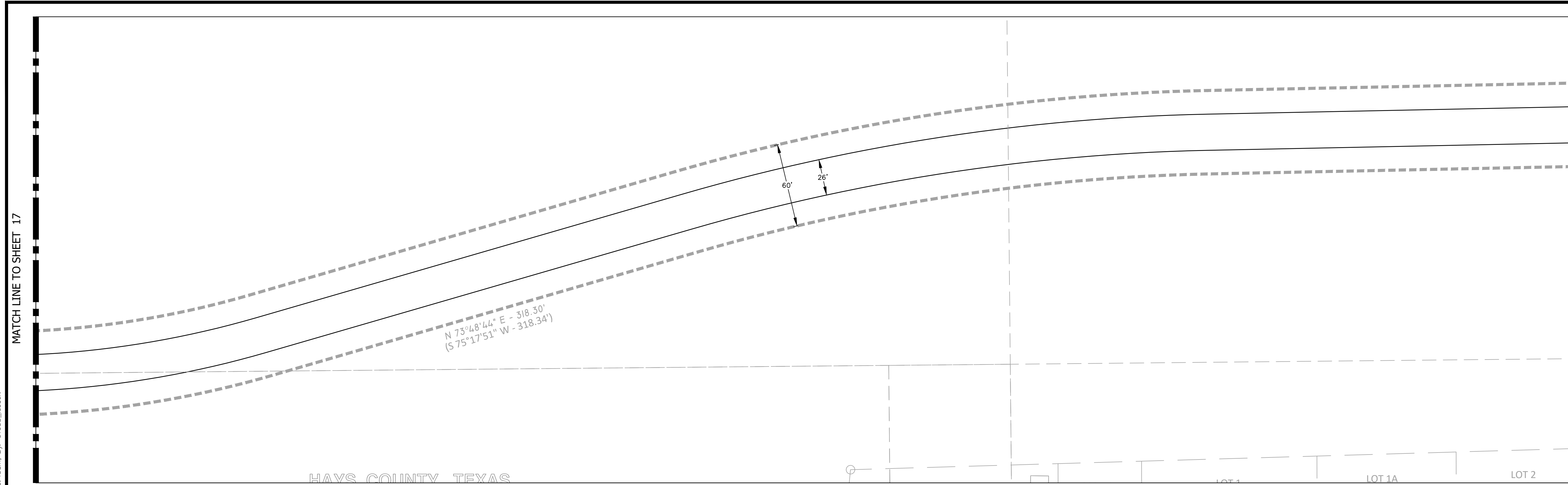
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001

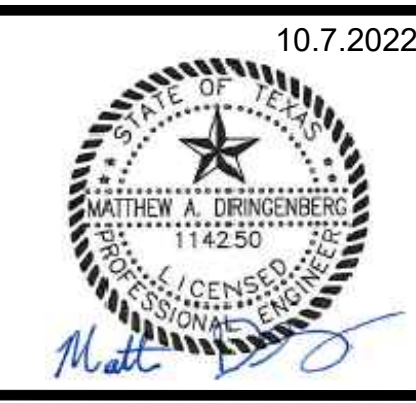
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SHEET 17 OF 36

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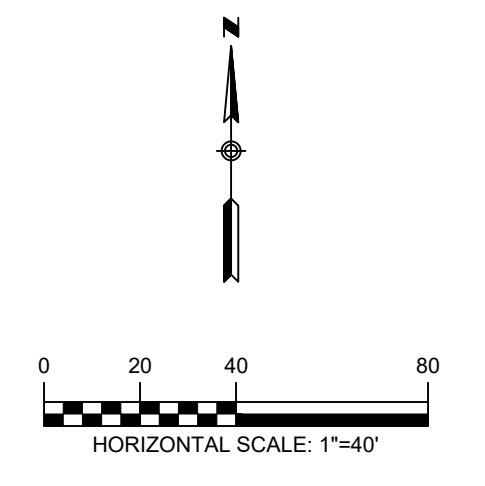
SITE AND DIMENSION CONTROL PLAN (4 OF 5)

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

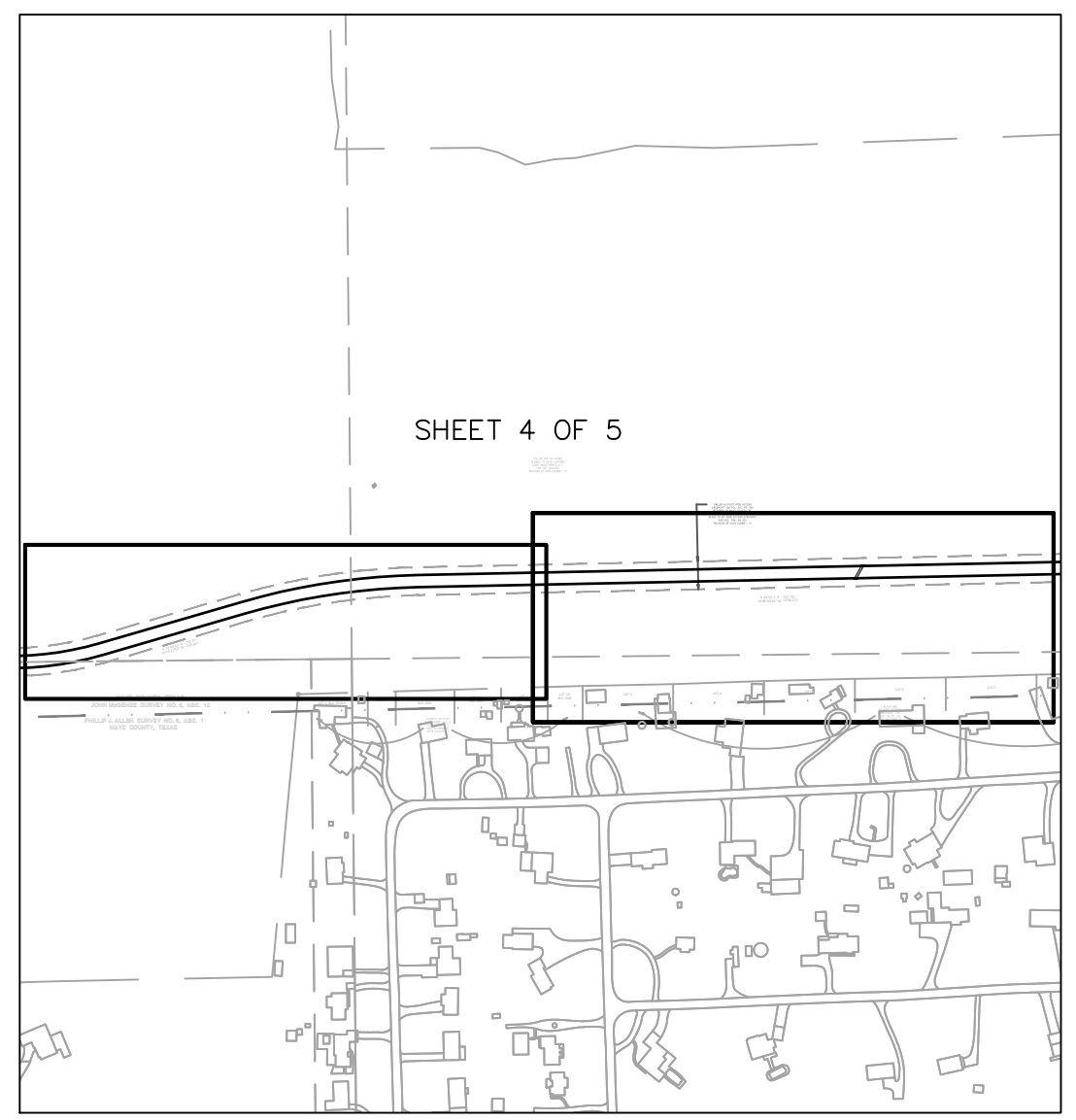
PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 18 OF 36



- LEGEND**
- PROPERTY BOUNDARY
  - - - EASEMENT LINE
  - FIRE — FIRE LANE
  - CURB AND GUTTER
  - LOC — LIMITS OF CONSTRUCTION
  - ..... ACCESSIBLE ROUTE
  - ↑ SIGN



**TEXAS ONE CALL SYSTEM**  
 1-800-245-4545

UNDER PENALTY OF LAW, THE CONTRACTOR IS REQUIRED TO CONTACT THE TEXAS ONE CALL SYSTEM AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

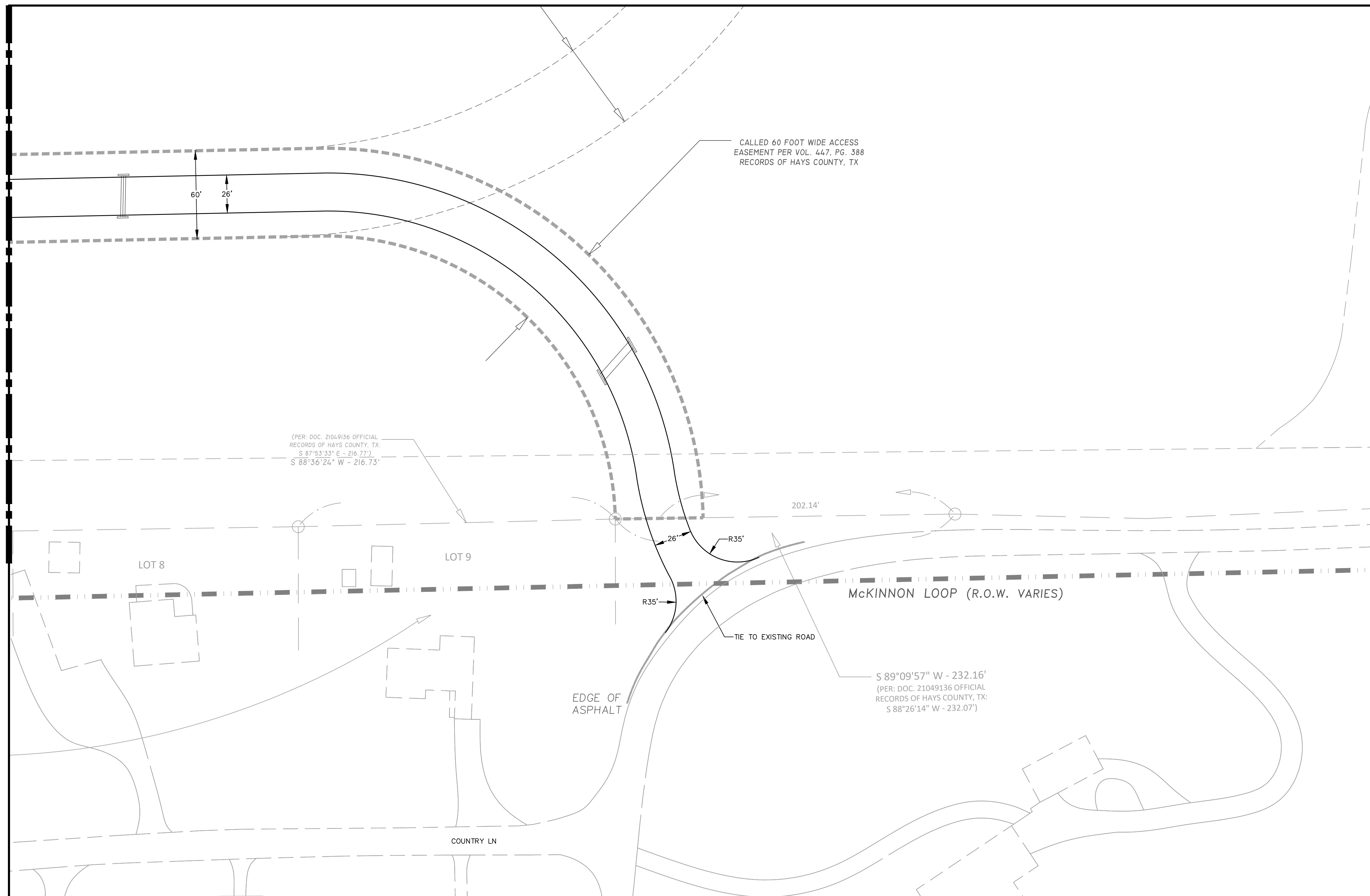
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O:\CompanyData\Clients\0946 - James Stinson\001-20-Carpenter Hill RV Park Development\CAD [com]\Sheets\0946-001-SITE.dwg -- Layout: "SITE AND DIMENSION CONTROL PLAN (5 OF 5)" -- Fri, Oct 07, 2022, 10:45am, By: C1038\_ljrcsn

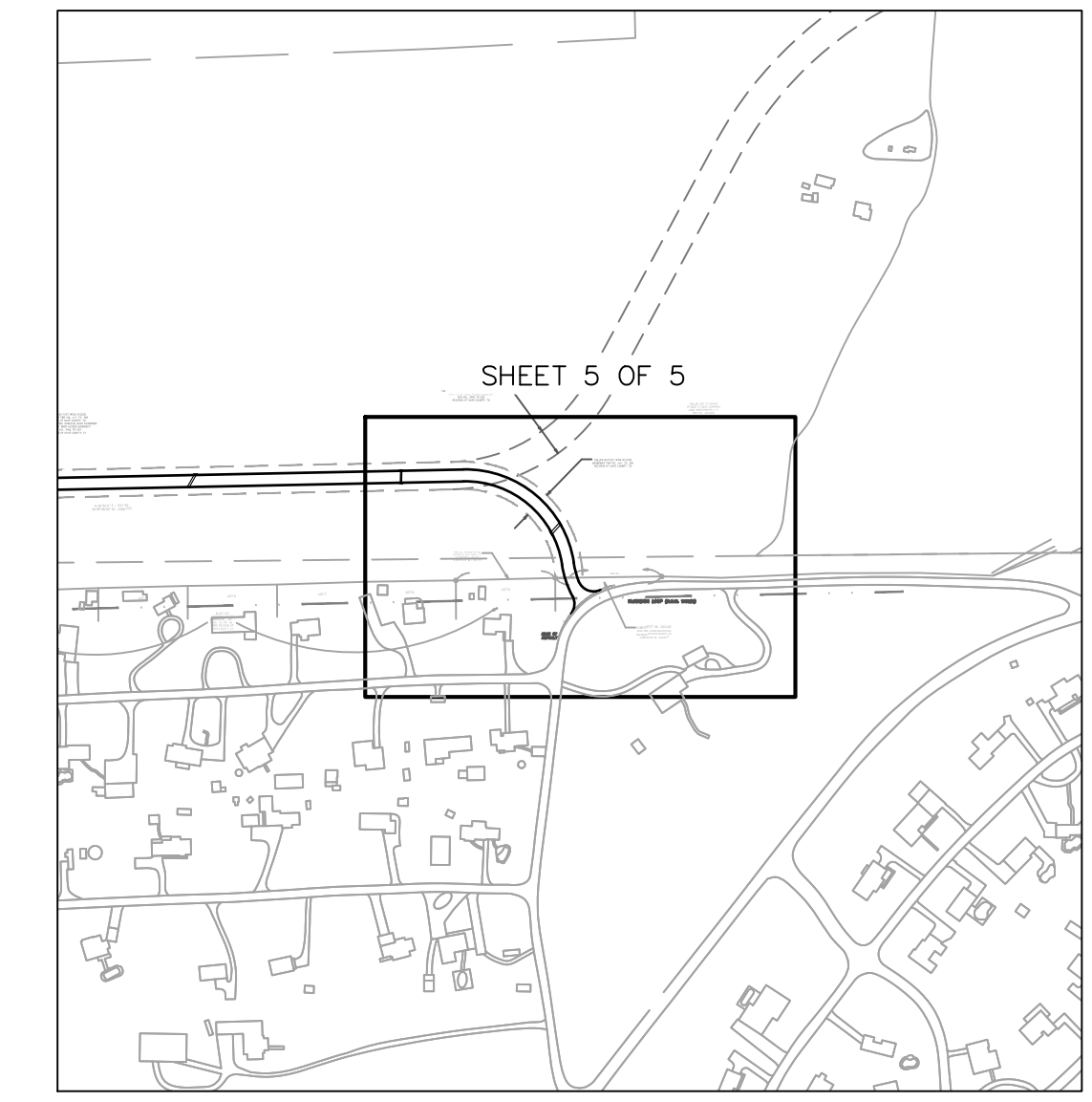
MATCH LINE TO SHEET 18



**LEGEND**

- PROPERTY BOUNDARY
- - - EASEMENT LINE
- FIRE
- CURB AND GUTTER
- LOC
- LIMITS OF CONSTRUCTION
- ACCESSIBLE ROUTE
- ▲ SIGN

0 20 40 80  
 HORIZONTAL SCALE: 1"=40'



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NO.	REVISION	DATE

10.7.2022

MATTHEW A. DRINGENBERG  
 1142250  
 LICENSED PROFESSIONAL ENGINEER  
 STATE OF TEXAS

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**CENTRAL TEXAS**  
 205 Cimarron Park Loop, Ste. B, Buda TX 78610  
 P: 512.312.4330

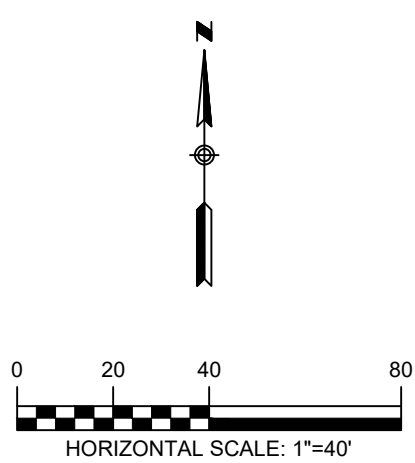
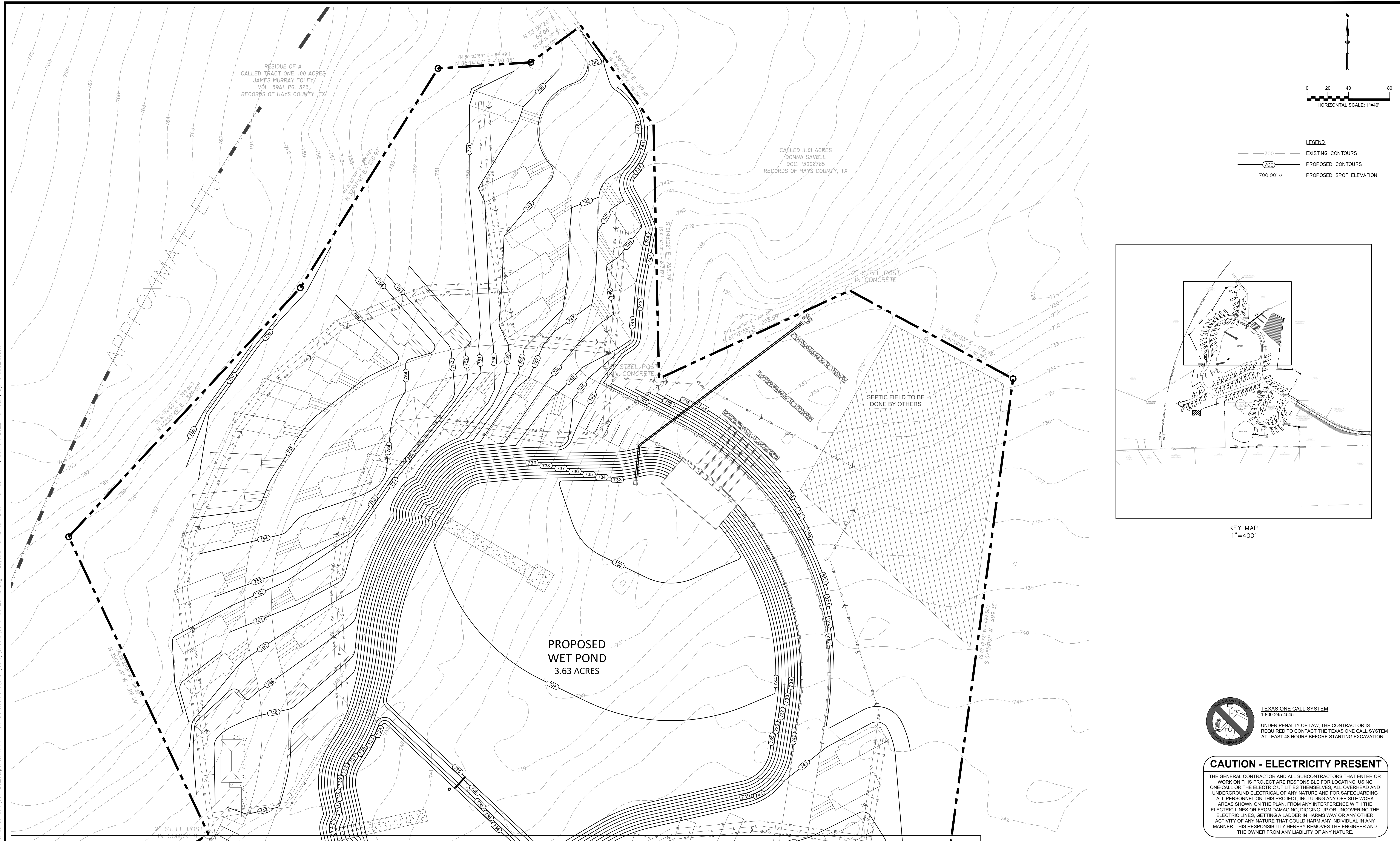
**WARNING**  
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 DRAWN BY: AL  
 CHECKED BY: HJ

SITE AND DIMENSION CONTROL PLAN (5 OF 5)  
**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	19 OF 36

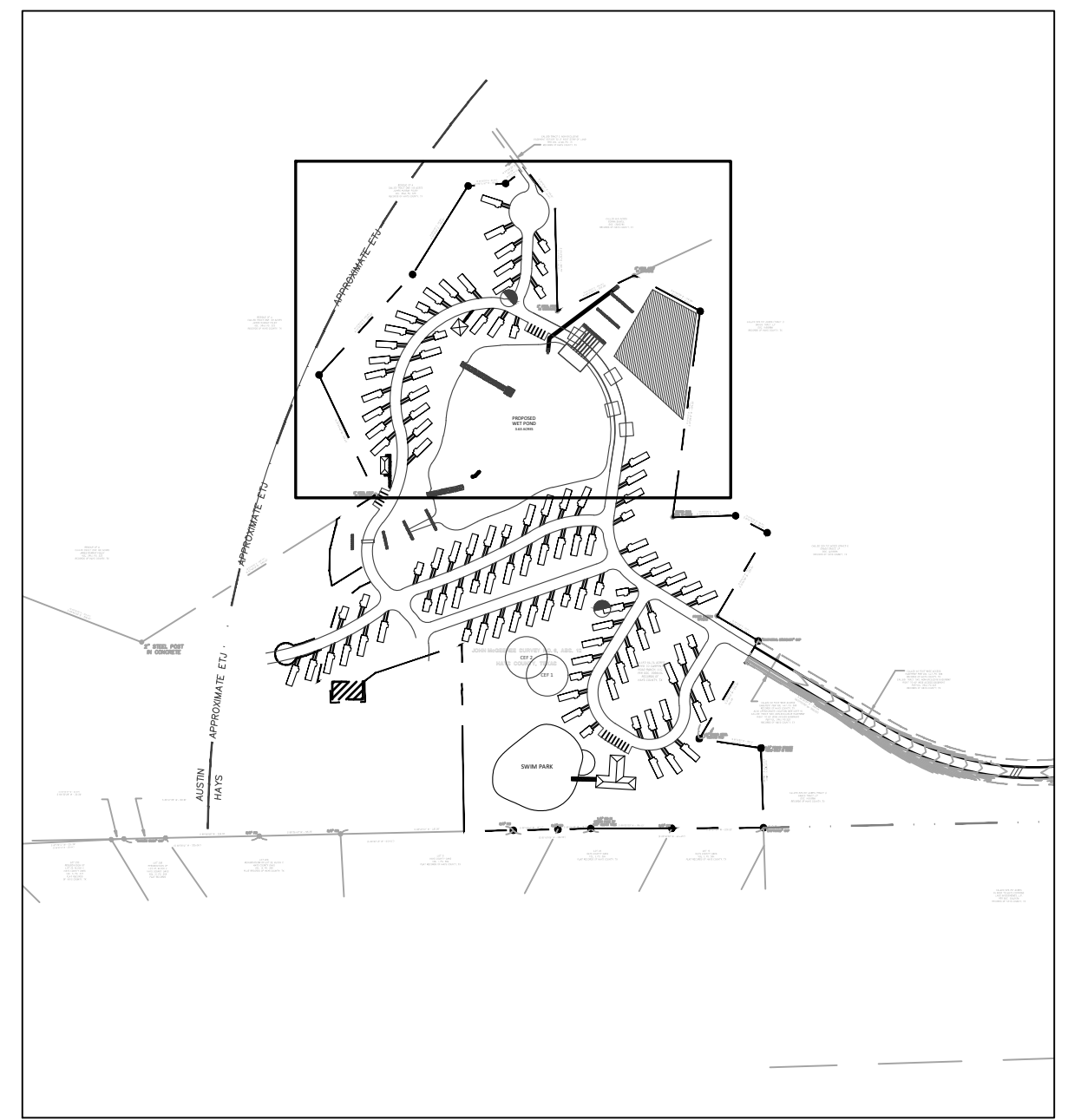


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**LEGEND**

	EXISTING CONTOURS
	PROPOSED CONTOURS
	PROPOSED SPOT ELEVATION

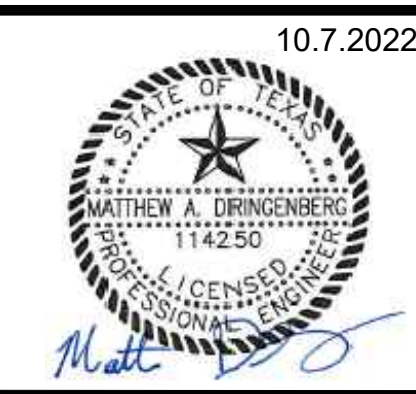


KEY MAP  
1"=400'

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**CENTRAL TEXAS**  
205 Cimarron Park Loop, Ste. B, Buda TX 78610  
P: 512.312.4335

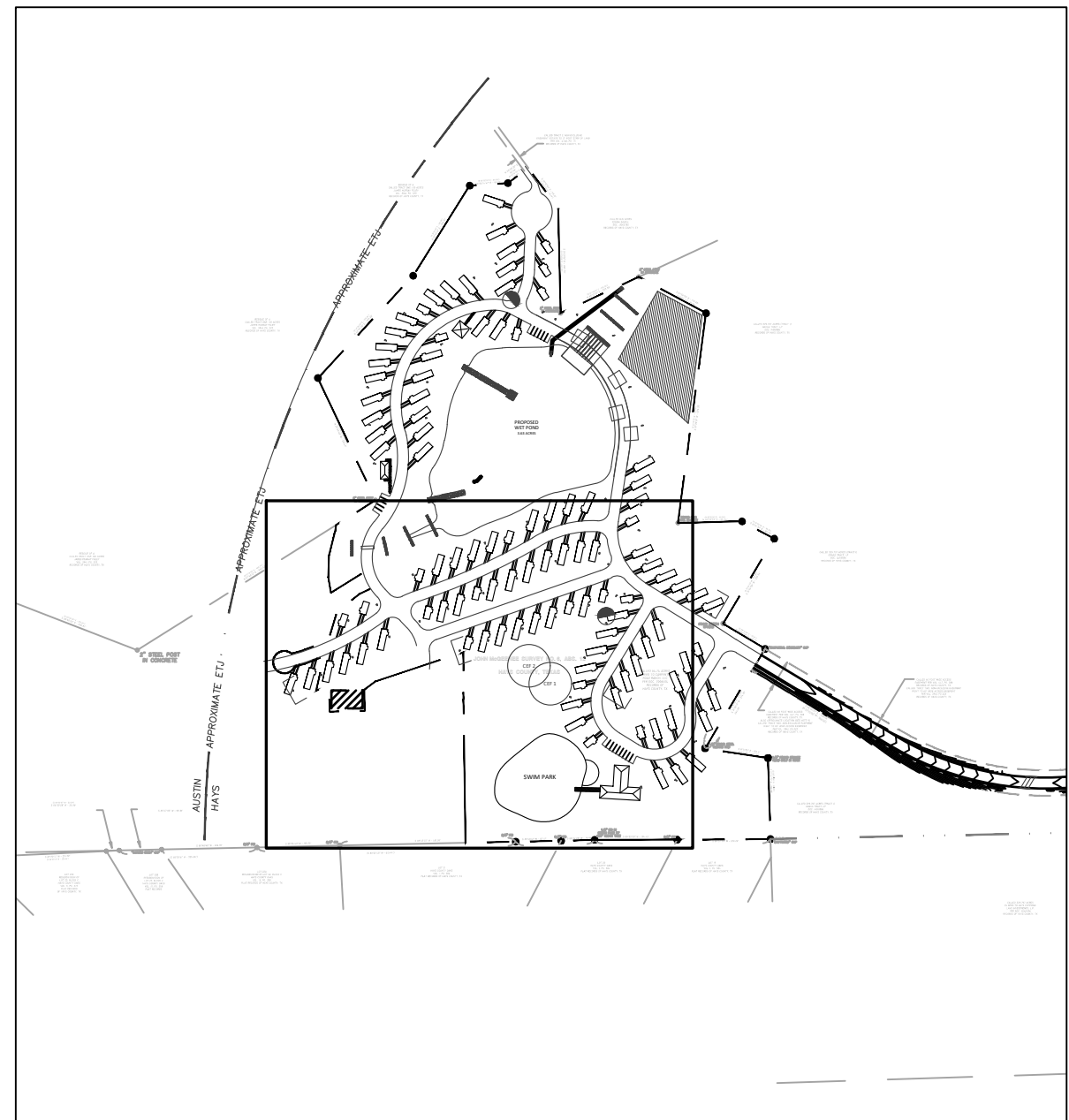
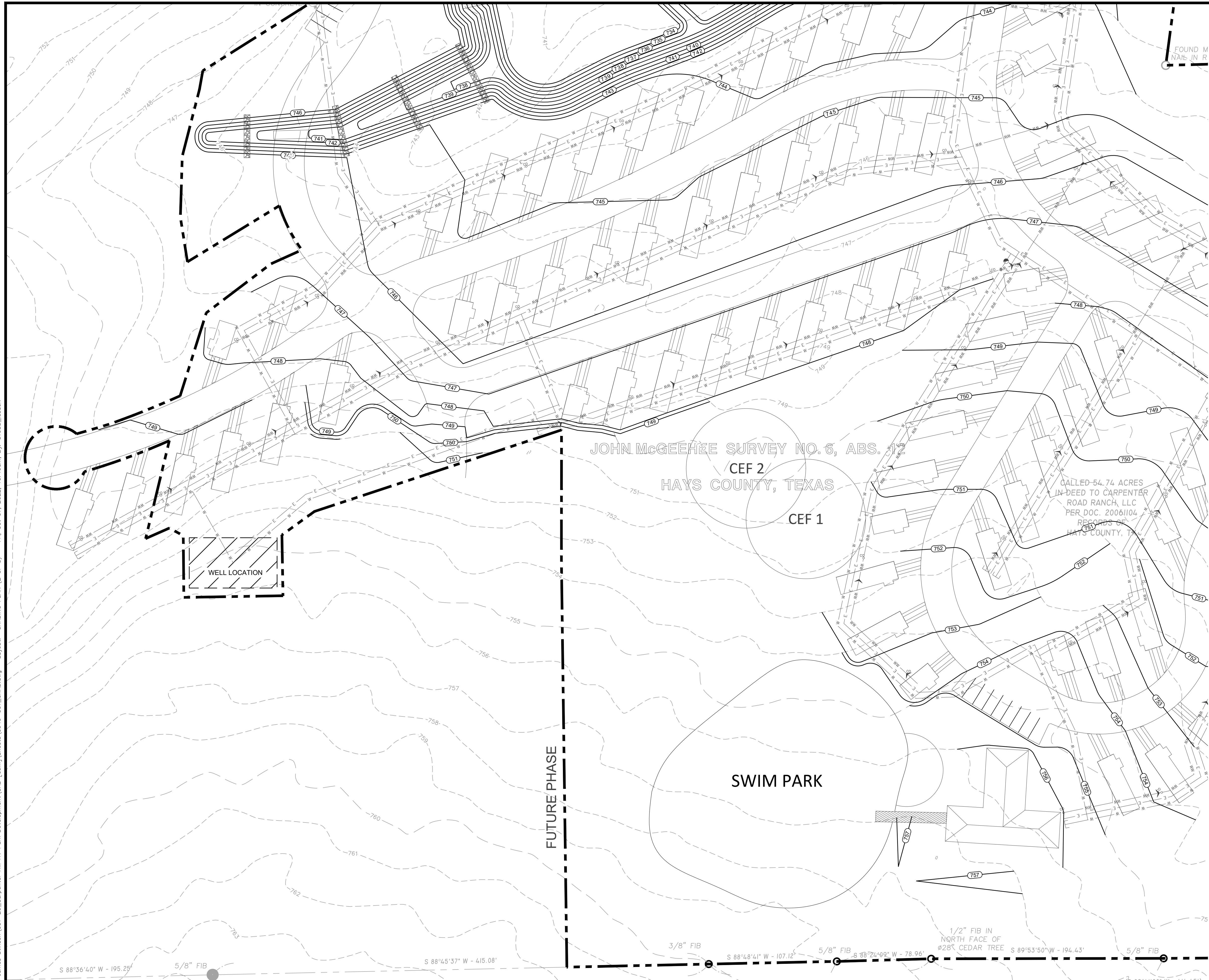
**WARNING**  
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DRAWN BY: AL  
  
CHECKED BY: HJ

GRADING PLAN (1 OF 5)  
  
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	20 OF 36



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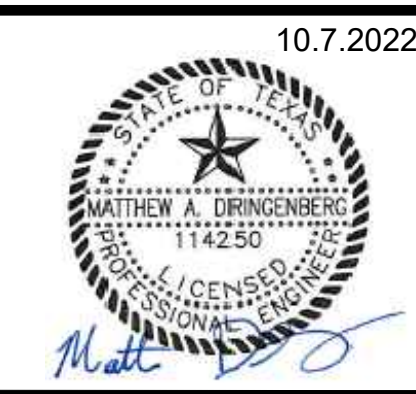


KEY MAP  
1"=400'

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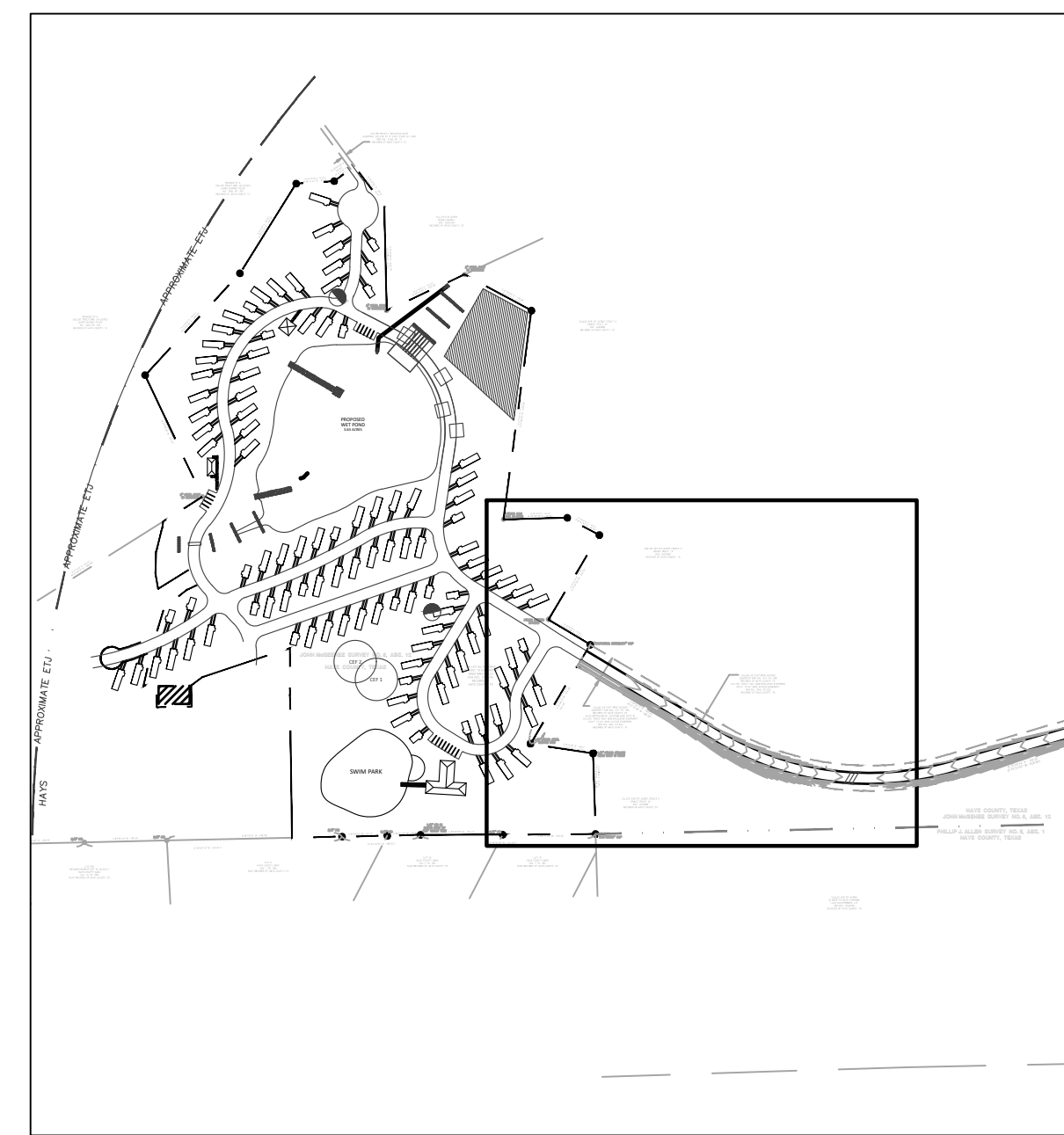
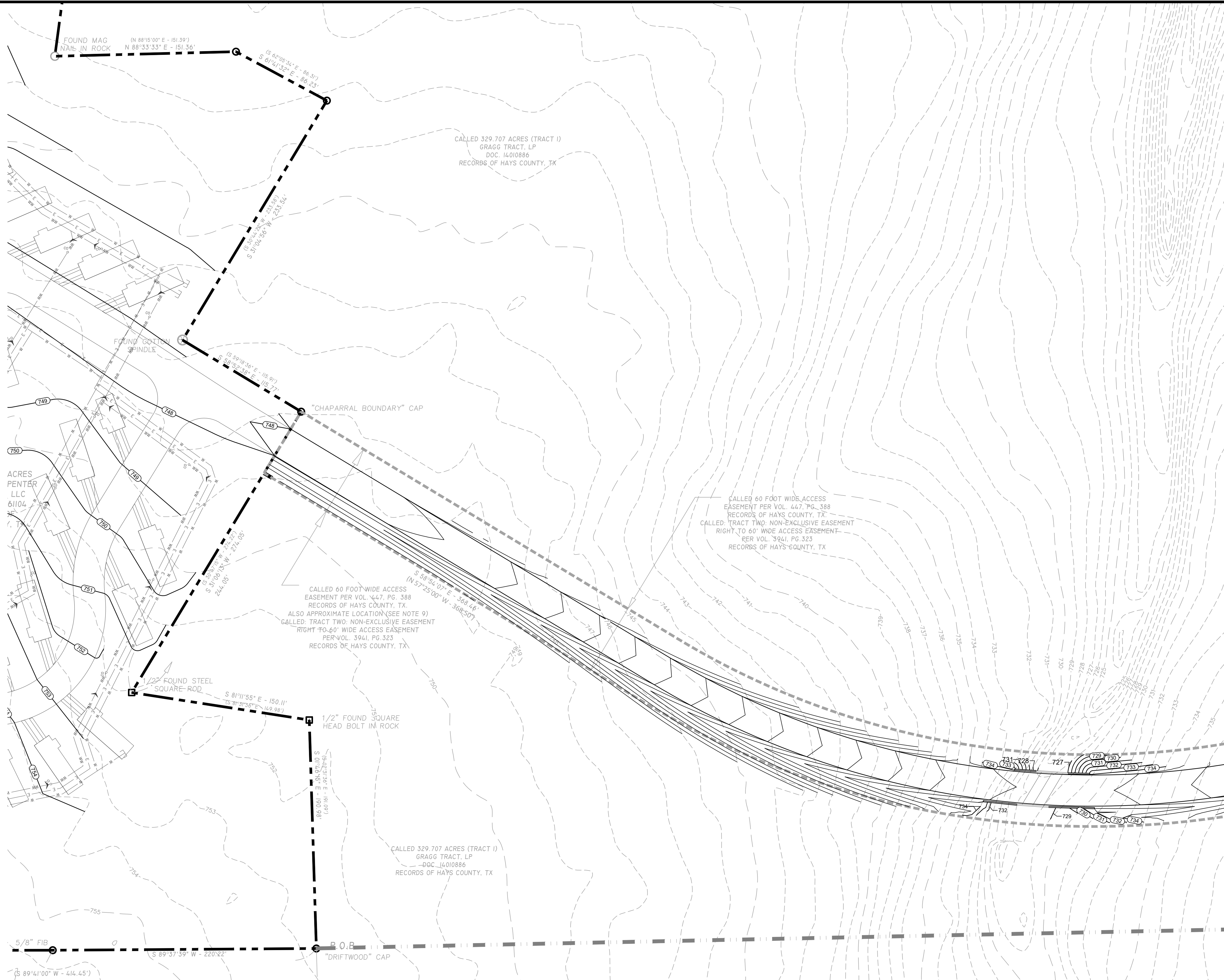
GRADING PLAN (2 OF 5)

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

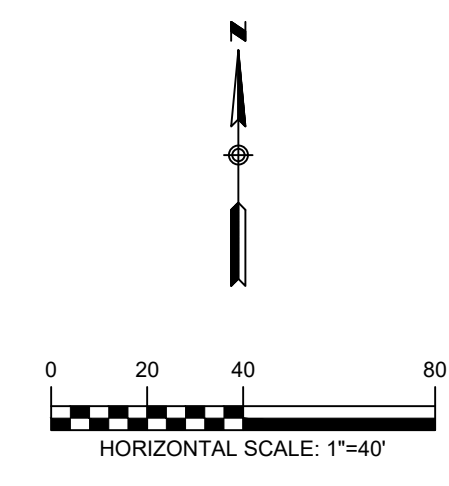
PROJECT NO.	0946-001
DRAWING NO.	
SHEET	21 OF 36



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KEY MAP  
1"=400'



**LEGEND**

	EXISTING CONTOURS
	PROPOSED CONTOURS
	PROPOSED SPOT ELEVATION

MATCH LINE TO SHEET 23

**TEXAS ONE CALL SYSTEM**  
1-800-245-4545

UNDER PENALTY OF LAW, THE CONTRACTOR IS REQUIRED TO CONTACT THE TEXAS ONE CALL SYSTEM AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

**CAUTION - ELECTRICITY PRESENT**

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NO.	REVISION	DATE

10.7.2022

Matthew A. Dringenberg  
Professional Engineer  
State of Texas  
License No. 114250

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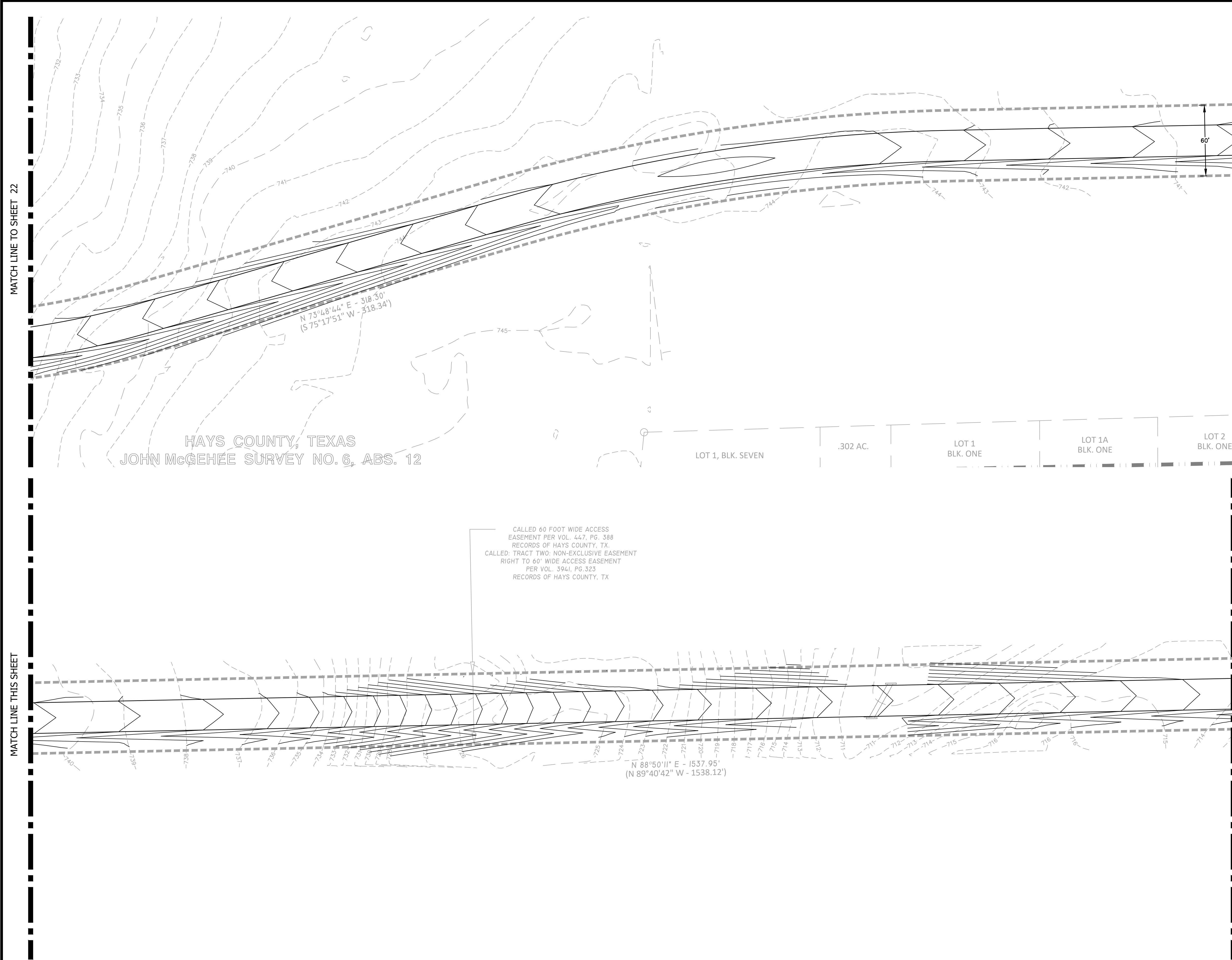
GRADING PLAN (3 OF 5)

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	22 OF 36

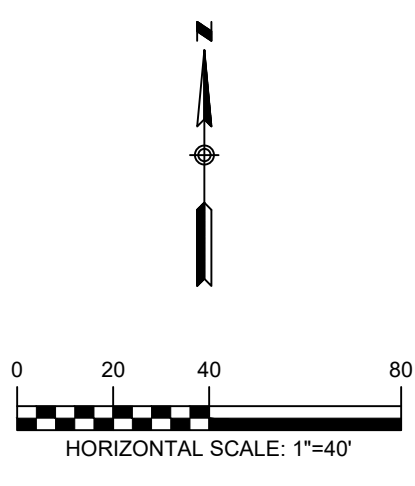


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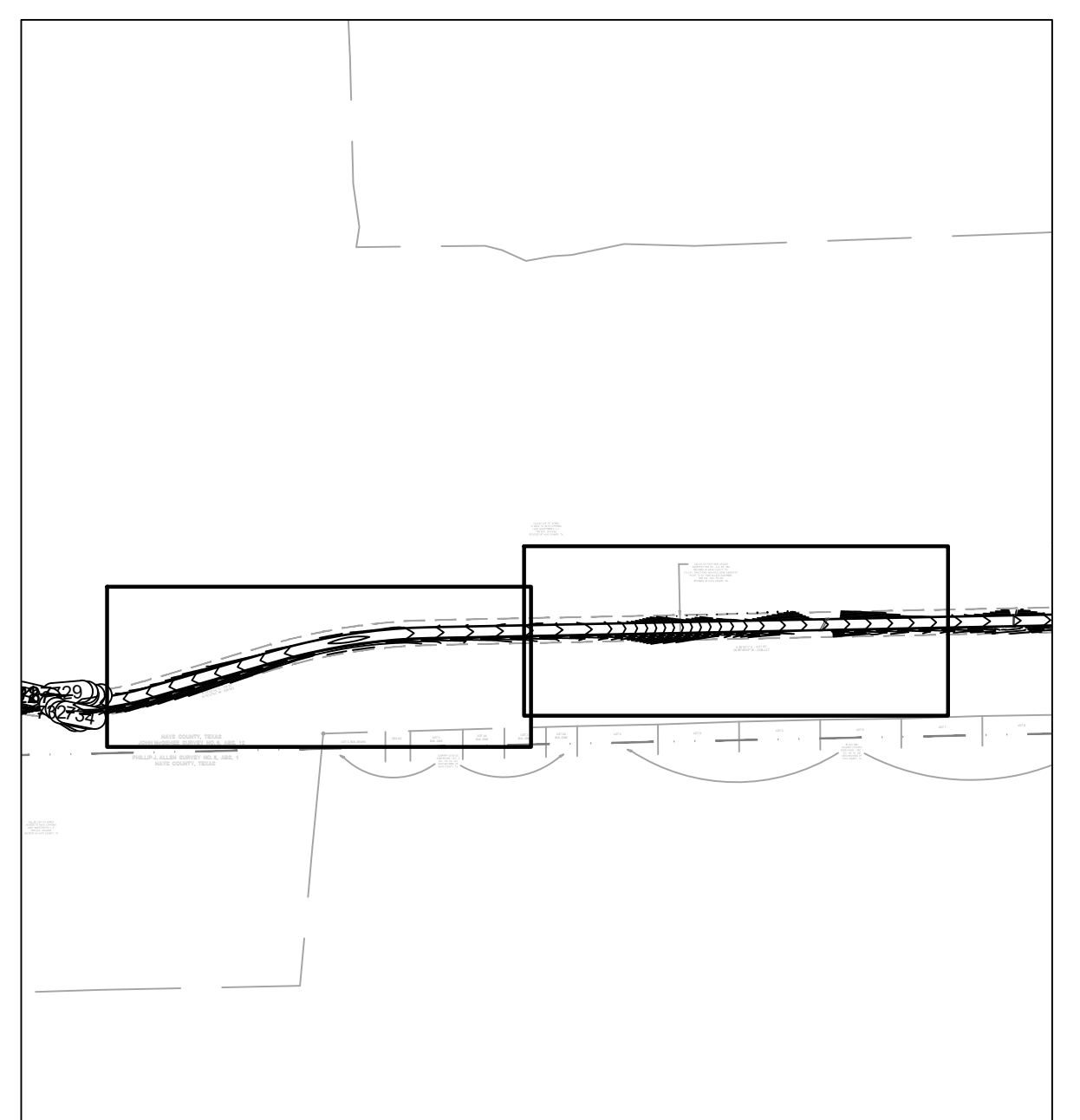
MATCH LINE TO SHEET 24

MATCH LINE TO SHEET 22



**LEGEND**

	EXISTING CONTOURS
	PROPOSED CONTOURS
	PROPOSED SPOT ELEVATION



KEY MAP  
1" = 400'

CALLED 60 FOOT WIDE ACCESS  
EASEMENT PER VOL. 447, PG. 388  
RECORDS OF HAYS COUNTY, TX.  
CALLED TRACT TWO: NON-EXCLUSIVE EASEMENT  
RIGHT TO 60' WIDE ACCESS EASEMENT  
PER VOL. 394I, PG. 323  
RECORDS OF HAYS COUNTY, TX

HAYS COUNTY, TEXAS  
JOHN McGEHEE SURVEY NO. 6, ABS. 12

N 88°50'11" E - 1537.95'  
(N 89°40'42" W - 1538.12')

N 73°48'44" E - 318.30'  
(S 75°17'51" W - 318.34')

**TEXAS ONE CALL SYSTEM**  
1-800-245-4545

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ALL PERSONNEL ON THIS PROJECT, INCLUDING ANY OFF-SITE WORK  
AREAS SHOWN ON THE PLAN, FROM ANY INTERFERENCE WITH THE  
ELECTRIC LINES OR FROM DAMAGING, DIGGING UP OR UNCOVERING THE  
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NO.	REVISION	DATE

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P: 512.312.4330

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GRADING PLAN (4 OF 5)

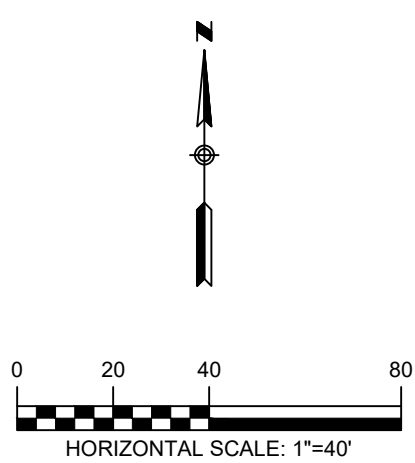
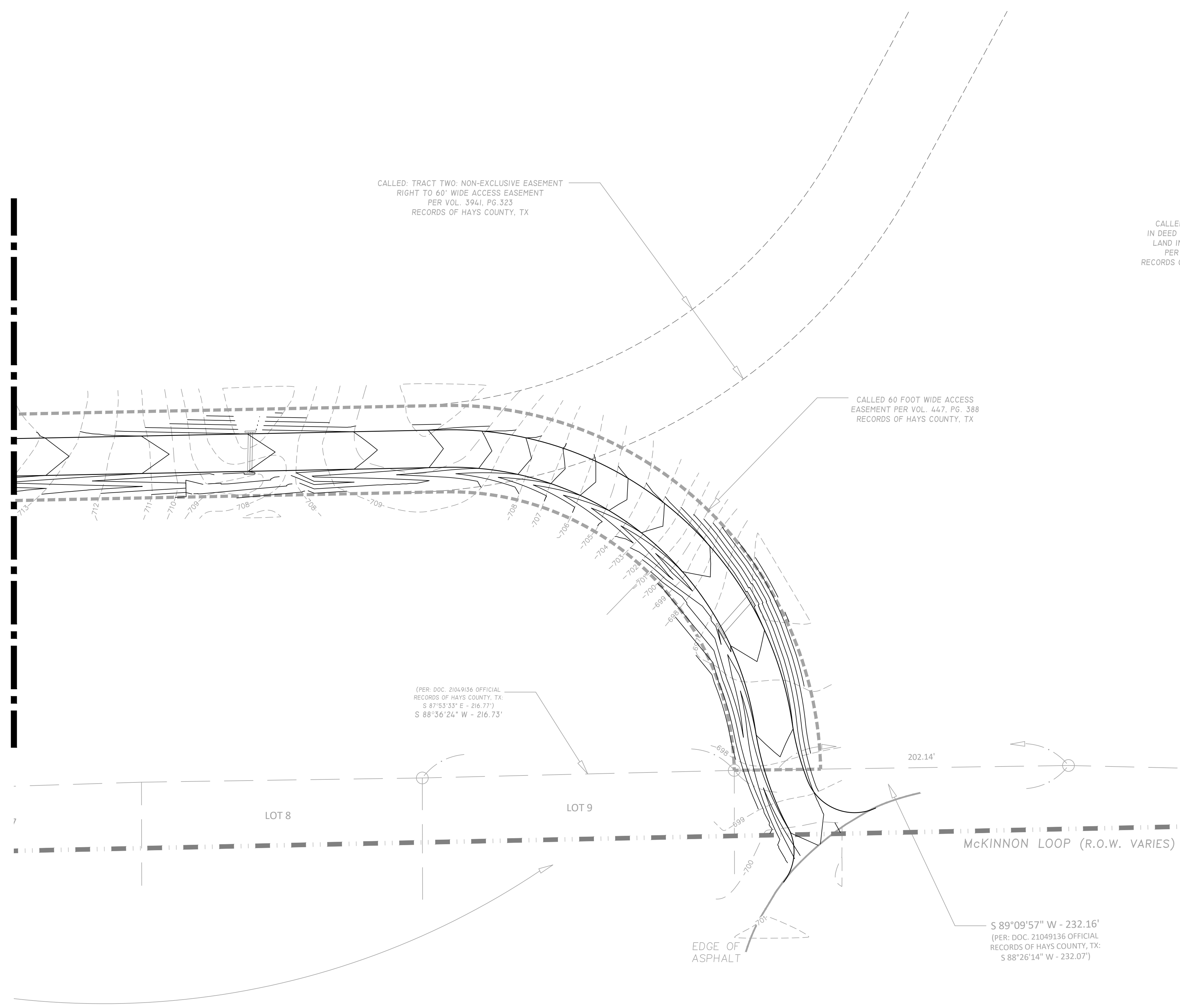
**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	23 OF 36



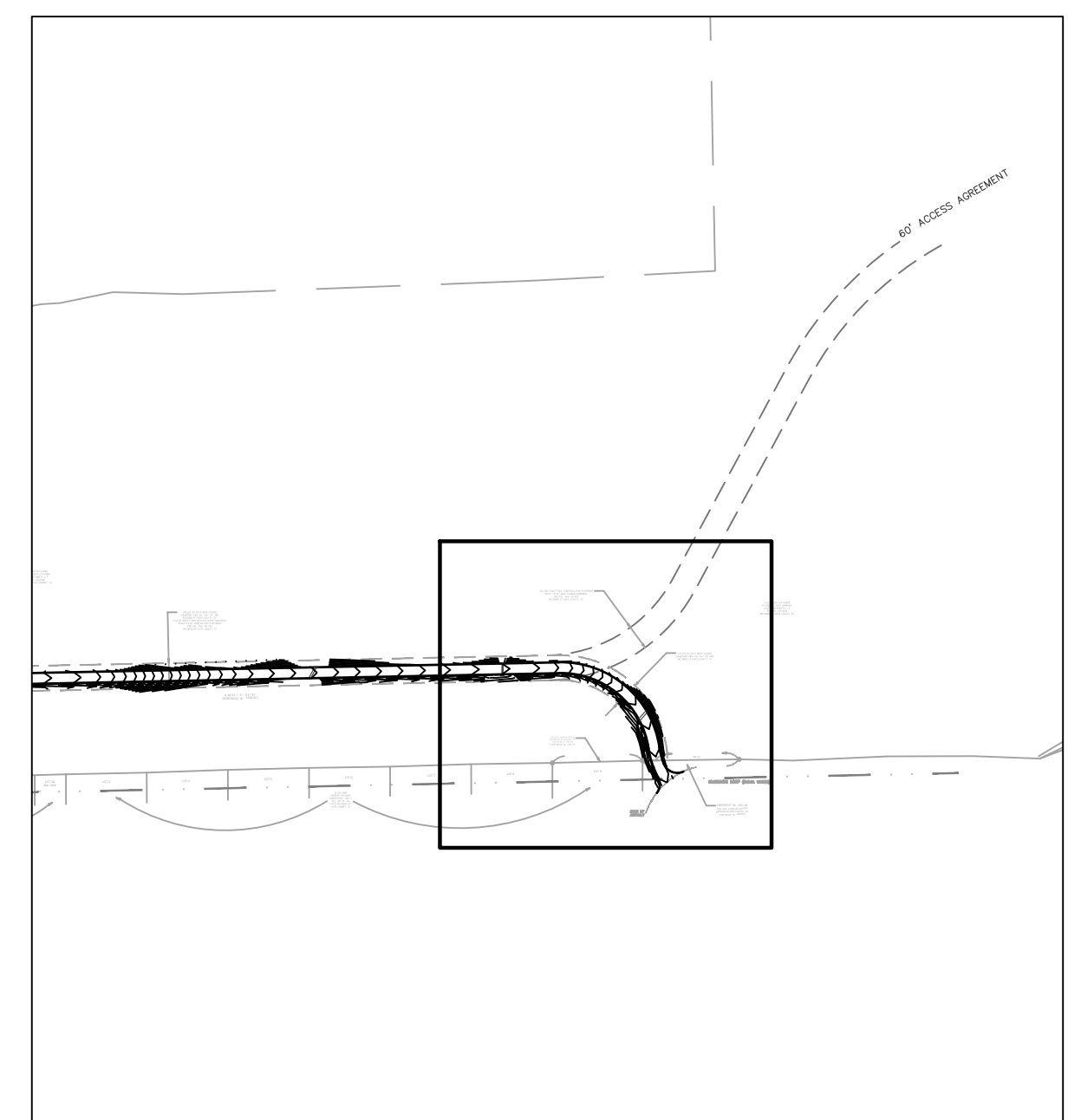
O:\CompanyData\Clients\0946 - James Stinson\001-20-Carpenter Hill RV Park Development\CAD [Exam]\Sheets\0946-001\_GRAD.dwg - Layout: "GRADING PLAN (5 OF 5)" - Fri, Oct 07, 2022, 10:46am, By: C1038\_jeason

MATCH LINE TO SHEET 22




**LEGEND**

	EXISTING CONTOURS
	PROPOSED CONTOURS
	PROPOSED SPOT ELEVATION



KEY MAP  
1"=400'



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1-800-245-4545

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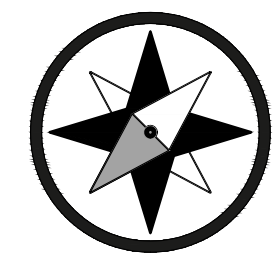
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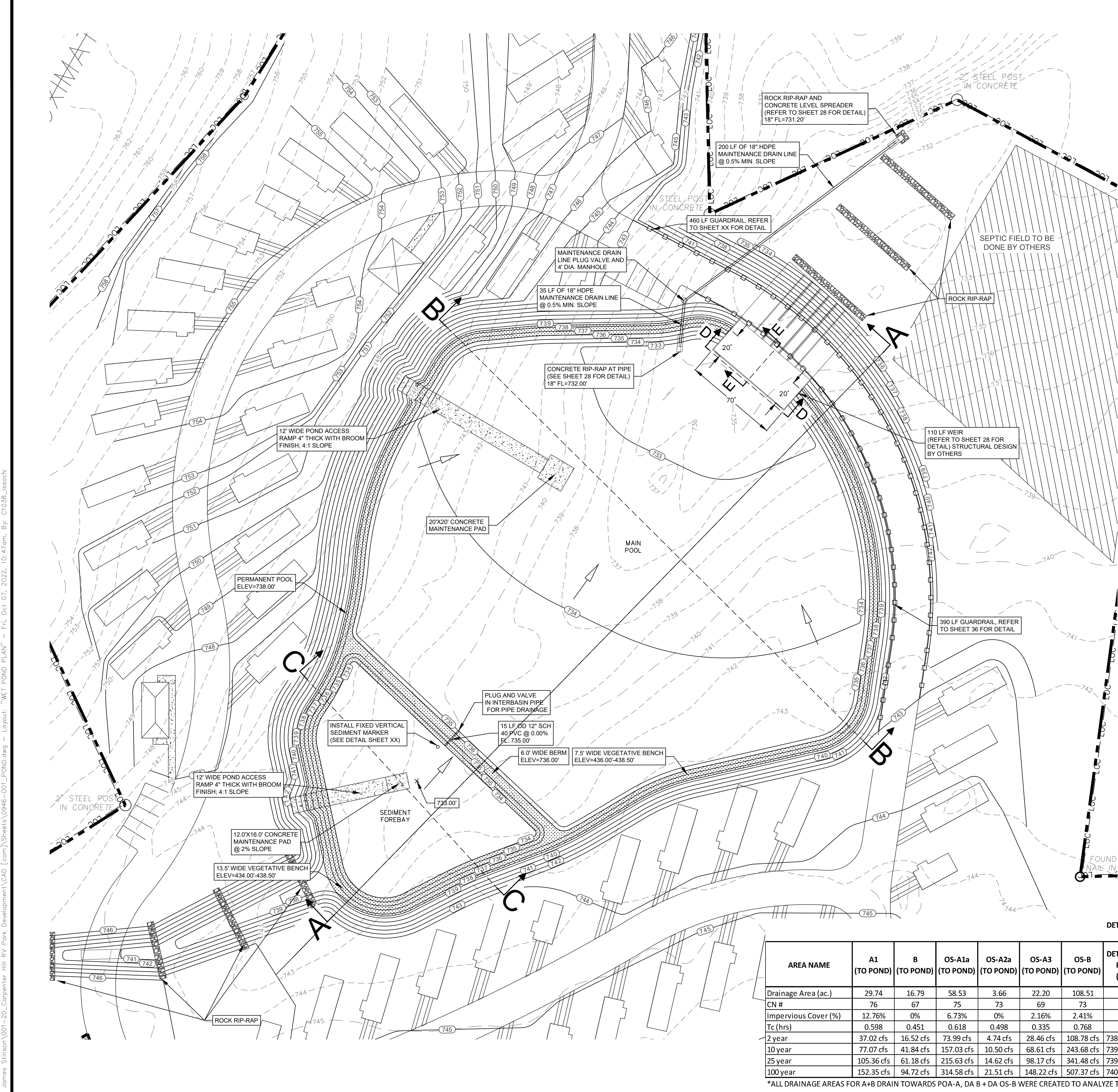
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GRADING PLAN (5 OF 5)

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	24 OF 36





**WET POND MAINTENANCE REQUIREMENTS:**

DURING SITE CONSTRUCTION - THE SEDIMENT LOAD TO THE SEDIMENT FOREBAY SHALL BE CLOSELY MONITORED AFTER EVERY STORM EVENT. IF HEAVY SEDIMENT LOADS ARE DETECTED DURING AN INSPECTION, THE SOURCE SHOULD BE CORRECTED. SEDIMENT SHALL BE REMOVED FROM THE SEDIMENT FOREBAY WHEN ONE-THIRD OF THE FOREBAY VOLUME IS LOST.

UPON COMPLETION OF SITE REVEGETATION - ANY SEDIMENT BUILD-UP (GREATER THAN 5% VOLUME LOSS) SHALL BE REMOVED FROM THE FOREBAY UPON COMPLETION OF SITE REVEGETATION. THE SEDIMENT BUILD-UP IN THE MAIN POOL SHALL BE CHECKED AND IF MORE THAN TEN-PERCENT OF THE VOLUME IS LOST, IT SHOULD BE CLEANED AT THAT TIME.

EVERY THREE MONTHS FOR THE FIRST TWO YEARS - DURING THE THREE MONTH INITIAL INSPECTION CYCLE, IF MORE THAN FIFTEEN PERCENT OF THE VOLUME OF THE FOREBAY IS LOST, IT SHALL BE CLEANED AT THAT TIME.

EVERY THREE MONTHS - TURF AREAS AROUND THE POND SHOULD BE MOWED. ACCUMULATED PAPER, TRASH, AND DEBRIS SHALL BE REMOVED EVERY THREE MONTHS OR AS NECESSARY. CATTAILS, COTTONWOODS, AND WILLOWS CAN QUICKLY COLONIZE SHALLOW WATER AND THE EDGE OF THE POND. THESE SPECIES OF ANY AREAS OF PLANT OVERGROWTH MAY BE THINNED AT THIS TIME OR AS NEEDED.

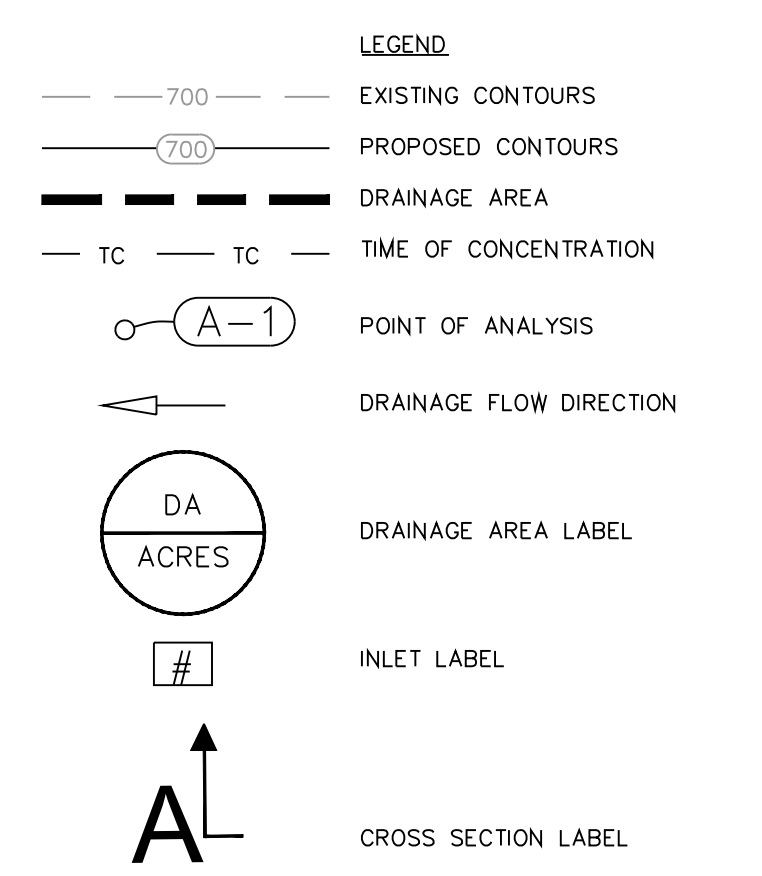
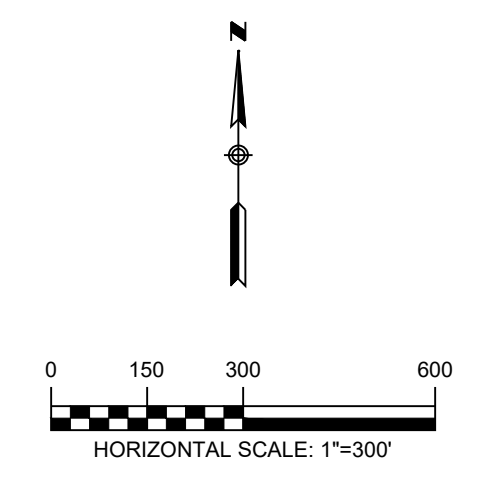
ANNUALLY - THE BASIN SHOULD BE INSPECTED ANNUALLY FOR SIDE SLOPE EROSION AND DETERIORATION OR DAMAGE TO THE STRUCTURAL ELEMENTS. ANY DAMAGE SHALL BE REPAIRED. LARGE AREAS, WHICH HAVE DEAD OR MISSING VEGETATION SHALL BE REPLANTED.

EVERY THREE YEARS - THE SEDIMENT BUILD-UP IN THE SEDIMENT FOREBAY SHALL BE CHECKED. THE SEDIMENT FOREBAY SHALL BE CLEANED IF MORE THAN ONE-THIRD OF THE FOREBAY VOLUME IS LOST.

EVERY SIX YEARS - THE SEDIMENT BUILD-UP IN THE MAIN POOL SHALL BE CHECKED. SEDIMENT SHALL BE REMOVED FROM THE MAIN POOL WHEN TWENTY PERCENT OF THE MAIN POOL VOLUME IS LOST.

**NOTES:**

- CONTRACTOR TO VERIFY LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO CONSTRUCTION AND ENSURE CONTINUITY OF SERVICES AS NECESSARY.
- ALL POND BOTTOMS, SIDE SLOPES, AND EARTHEN EMBANKMENTS SHALL BE COMPACTED TO NINETY-FIVE (95%) PERCENT MAXIMUM DENSITY IN ACCORDANCE WITH THE CITY OF AUSTIN STANDARD SPECIFICATIONS.
- EXPANSION JOINTS ON FREE STANDING WALLS SHALL HAVE WATER TIGHT SEALS AS NEEDED.
- ALL DISTURBED AREAS AND AREAS DESIGNATED AS "GRASS" AREAS SHALL RECEIVE A MINIMUM OF 4" OF TOP SOIL AND BE REVEGETATED BY SEED, HYDROMULCH, OR SOD. MAINTAIN AND WATER THESE AREAS AS NECESSARY TO ESTABLISH PERMANENT REVEGETATIVE GROWTH OF APPROXIMATELY TWO (2) INCHES OF HEIGHT OVER 70% OF AREA.
- TOPSOIL THAT HAS BEEN STRIPPED FROM THE SITE AND STOCKPILED MAY BE USED. REMOVE ALL BRUSH, TRASH, STUMPS, WOOD, CONCRETE AND OTHER DEBRIS OVER 1-1/2 IN SIZE PRIOR TO SPREADING.
- IF SUFFICIENT QUANTITIES ARE NOT AVAILABLE, PROVIDE IMPORTED TOPSOIL CHARACTERISTIC OF THE AREA. PROVIDE IMPORTED LOAM TOPSOIL CONTAINING A MINIMUM ORGANIC MATTER CONTENT BY WEIGHT OF 5%. TOPSOIL SHALL NOT HAVE A MIXTURE SUBSOIL AND SHALL CONTAIN NO STONES, LUMPS OF SOIL, STICKS, ROOTS, TRASH OR OTHER EXTRANEOUS MATERIALS LARGER THAN 1-1/2 INCHES IN DIAMETER OR LENGTH.
- UPON COMPLETION OF THE WET POND, CONTRACTOR SHALL TAKE DAILY MEASUREMENTS OF THE WATER SURFACE ELEVATION AND PRECIPITATION TO ENSURE THE POND LINER IS NOT LEAKING. THESE MEASUREMENTS ARE TO BE TAKEN OVER AN 8 WEEK PERIOD.



- NOTES:**
- ON-SITE SURVEY TOPOGRAPHIC INFORMATION PROVIDED BY ALBERT UECKER CONSULTING, LLC OBTAINED ON SEPTEMBER, 2021.
  - OFF-SITE TOPOGRAPHIC INFORMATION OBTAINED FROM TNRIS.

STAGE			STAGE		
(elev)	Surface Area (ft <sup>2</sup> )	Volume (ft <sup>3</sup> )	(elev)	Surface Area (ft <sup>2</sup> )	Volume (ft <sup>3</sup> )
733.00	0	0	732.00	0	0
734.00	15530	7765	733.00	11485	5743
735.00	17108	24084	734.00	58725	40848
736.00	18742	42009	735.00	103432	121926
737.00	20590	61675	736.00	106833	227059
738.00	21744	82842	737.00	130956	345953
			738.00	135464	479164

DETENTION				
STAGE (FEET)	AREA (ACRES)	VOLUME (AC-FT)	DISCHARGE (CFS)	
738.00	3.110	0	0	
738.50	3.163	1.568	116.67	
739.00	3.217	3.164	330.00	
739.50	3.274	4.786	606.25	
740.00	3.332	6.438	933.38	
740.50	3.392	8.119	1,304.44	
741.00	3.453	9.83	1,714.73	
741.50	3.516	11.572	2,160.81	
742.00	3.580	13.346	2,640.00	

**DETENTION SUMMARY TABLE (NRCS METHOD)**

AREA NAME	A1 (TO POND)	B (TO POND)	OS-A1a (TO POND)	OS-A2a (TO POND)	OS-A3 (TO POND)	OS-B (TO POND)	DETENTION POND (WSE)	DETENTION POND RELEASE	A2 (BYPASS)	A3 (BYPASS)	OS-A1b (BYPASS)	OS-A2b (BYPASS)	PR POA-A* (=DET. RELEASE +A2+A3+OS-A1b+OS-A2b)	EX POA-A* (=B+OS-B)	PR POA-B (=B+OS-B)	EX POA-B
Drainage Area (ac.)	29.74	16.79	58.53	3.66	22.20	108.51	-	-	6.68	1.56	8.48	5.69	-	-	-	-
CN #	76	67	75	73	69	73	-	-	76	80	74	73	-	-	-	-
Impervious Cover (%)	12.76%	0%	6.73%	0%	2.16%	2.41%	-	-	13.17%	26.92%	5.90%	0%	-	-	-	-
Tc (hrs)	0.598	0.451	0.618	0.498	0.335	0.768	-	-	0.689	0.171	0.649	0.499	-	-	-	-
2 year	37.02 cfs	16.52 cfs	73.99 cfs	4.74 cfs	28.46 cfs	108.78 cfs	738.80 (msl)	244.17 cfs	8.31 cfs	4.35 cfs	9.88 cfs	7.34 cfs	268.95 cfs	276.05 cfs	122.16	122.16
10 year	77.07 cfs	41.84 cfs	157.03 cfs	10.50 cfs	68.61 cfs	243.68 cfs	739.40 (msl)	550.98 cfs	17.33 cfs	8.24 cfs	21.54 cfs	16.27 cfs	605.51 cfs	619.44 cfs	276.93	276.93
25 year	105.36 cfs	61.18 cfs	215.63 cfs	14.62 cfs	98.17 cfs	341.48 cfs	739.75 (msl)	772.33 cfs	23.63 cfs	10.87 cfs	29.84 cfs	22.65 cfs	849.18 cfs	861.55 cfs	388.79	388.79
100 year	152.35 cfs	94.72 cfs	314.58 cfs	21.51 cfs	148.22 cfs	507.37 cfs	740.29 (msl)	1151.95 cfs	34.20 cfs	15.12 cfs	43.75 cfs	33.33 cfs	1264.56 cfs	1288.84 cfs	579.13	579.13

\*ALL DRAINAGE AREAS FOR A+B DRAIN TOWARDS POA-A, DA B + DA OS-B WERE CREATED TO ANALYZE THE STORM WATER RUNOFF AS IT LEAVES THE PROPERTY PRIOR TO REACHING POA-A.

NO.	REVISION	DATE

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 CHECKED BY: HJ

**WET POND PLAN**

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001

DRAWING NO. \_\_\_\_\_

SHEET 25 OF 36

C:\Compass\Draws\Clients\0946 - James Siskins\09-20-Carpenter Hill RV Park Development\CAD\_Export\0946-001\_POND.dwg - Layer: "WET\_POND\_PLAN" - Fri, Oct 07, 2022, 10:47am, By: C10181.messat



Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell. Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.

Characters shown in red are data entry fields.

Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3:  $L_M = 27.2(A_N \times P)$

where:  $L_M$  TOTAL PROJECT = Required TSS removal resulting from the proposed development = 80% of increased load  
 $A_N$  = Net increase in impervious area for the project  
 $P$  = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County = Hays  
 Total project area included in plan = 261.64 acres  
 Predevelopment impervious area within the limits of the plan = 7.92 acres  
 Total post-development impervious area within the limits of the plan = 12.65 acres  
 Total post-development impervious cover fraction = 0.05  
 $P$  = 33 inches

$L_M$  TOTAL PROJECT = 4241 lbs.

\* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = POA A

Total drainage basin/outfall area = 261.64 acres  
 Predevelopment impervious area within drainage basin/outfall area = 7.92 acres  
 Post-development impervious area within drainage basin/outfall area = 12.65 acres  
 Post-development impervious fraction within drainage basin/outfall area = 0.05  
 $L_M$  THIS BASIN = 4241 lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Wet Basin  
 Removal efficiency = 93 percent

4. Calculate Maximum TSS Load Removed ( $L_R$ ) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7:  $L_R = (BMP \text{ efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$

where:  $A_C$  = Total On-Site drainage area in the BMP catchment area  
 $A_i$  = Impervious area proposed in the BMP catchment area  
 $A_p$  = Penous area remaining in the BMP catchment area  
 $L_R$  = TSS Load removed from this catchment area by the proposed BMP

$A_C$  = 46.53 acres  
 $A_i$  = 3.80 acres  
 $A_p$  = 42.73 acres  
 $L_R$  = 4739 lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired  $L_M$  THIS BASIN = 7012 lbs.  
 $F$  = 1.48

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.

Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth = 4.00 inches  
 Post Development Runoff Coefficient = 0.11  
 On-site Water Quality Volume = 73080 cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP = 192.90 acres  
 Off-site impervious cover draining to BMP = 7.04 acres  
 Impervious fraction of off-site area = 0.04  
 Off-site Runoff Coefficient = 0.06  
 Off-site Water Quality Volume = 174635 cubic feet

Storage for Sediment = 49543

Total Capture Volume (required water quality volume(s) x 1.20) = 297258 cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.

The values for BMP Types not selected in cell C45 will show NA.

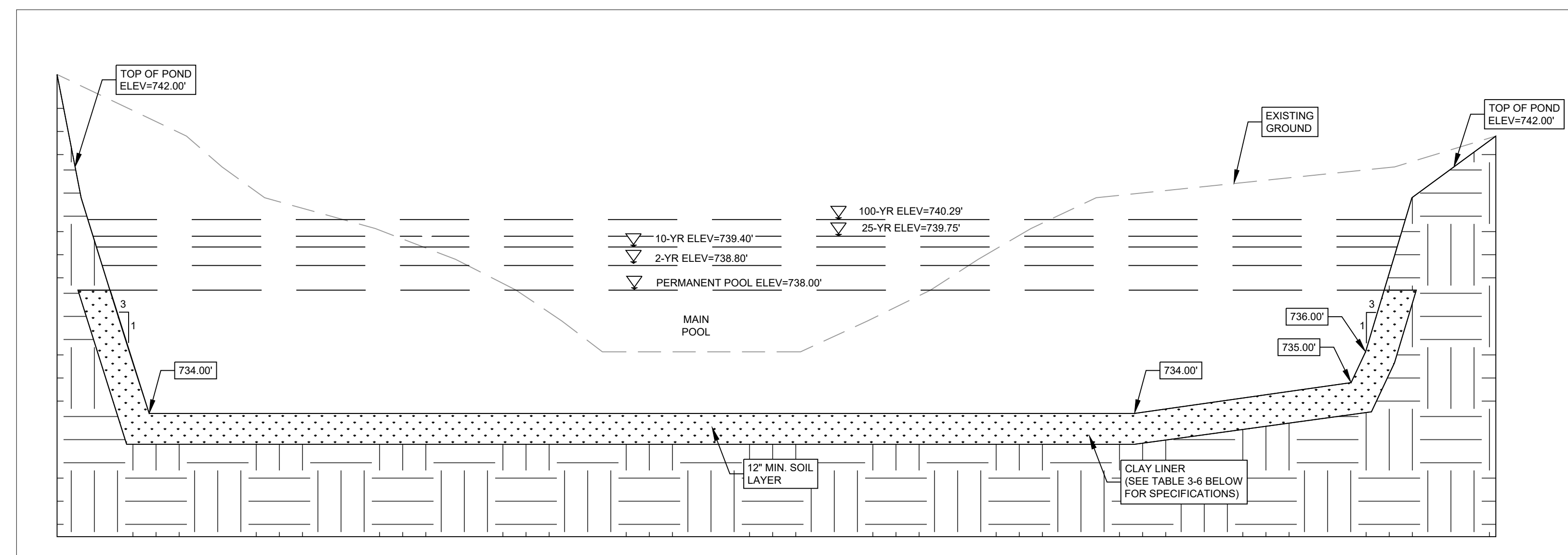
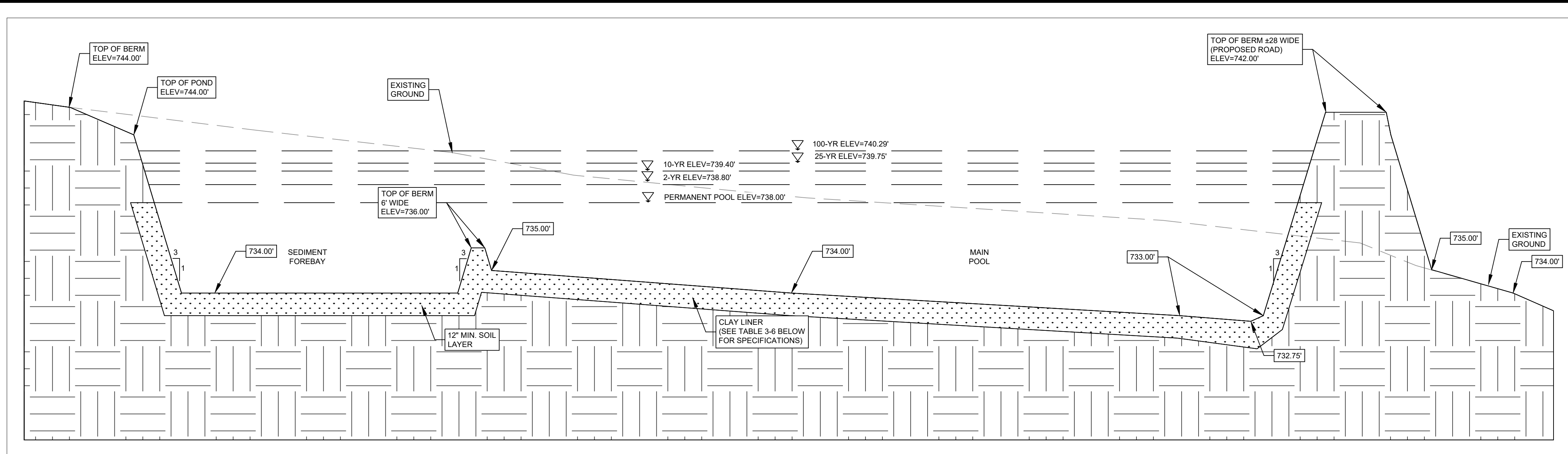
11. Wet Basins

Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = 297258 cubic feet  
 Required capacity at WQV Elevation = 370338 cubic feet  
 Permanent Pool Capacity is 1.20 times the WQV  
 Total Capacity should be the Permanent Pool Capacity plus a second WQV.

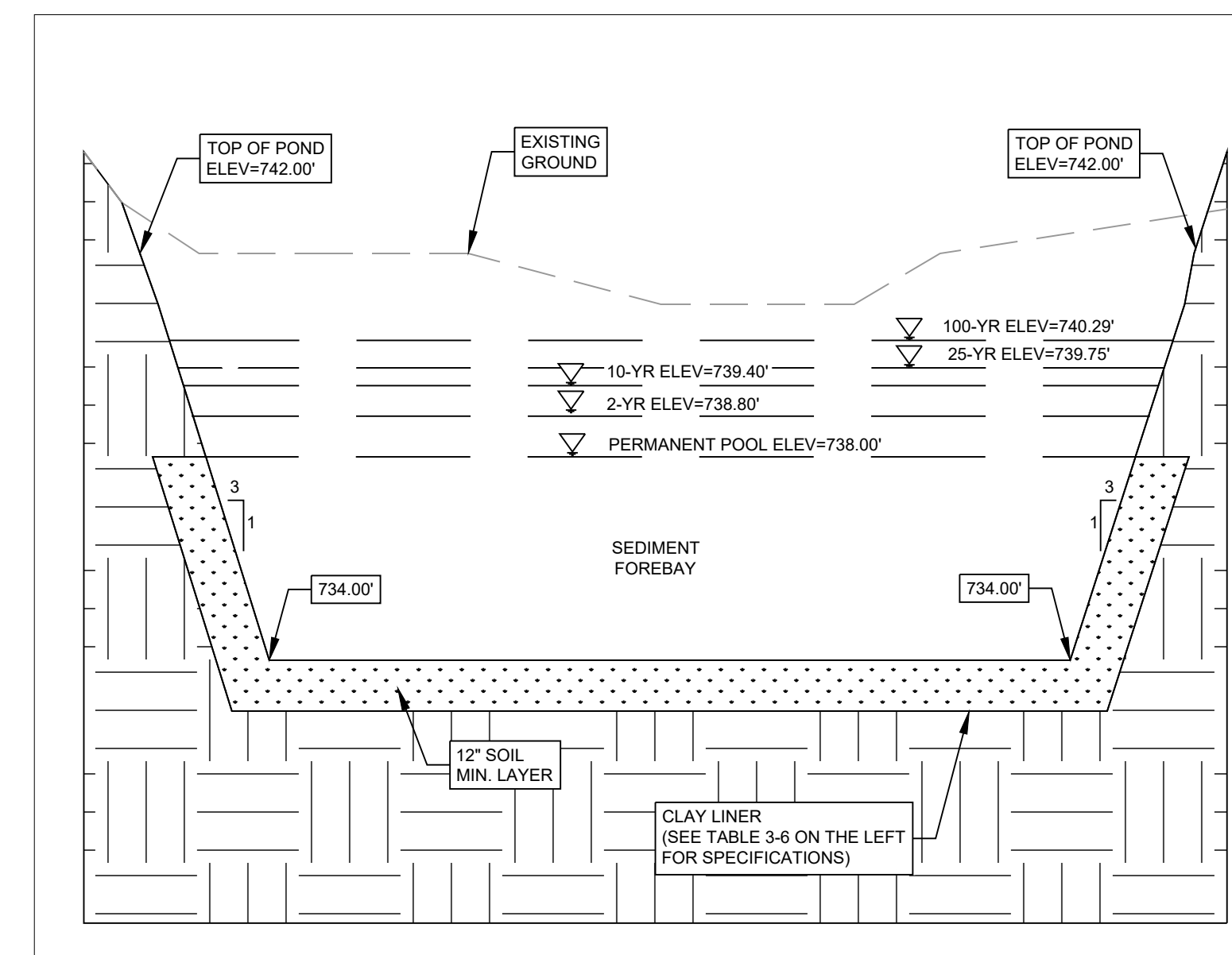
WET POND CROSS SECTION "A-A"

HORIZONTAL SCALE: 1"=30'  
 VERTICAL SCALE: 1"=3'



WET POND CROSS SECTION "B-B"

HORIZONTAL SCALE: 1"=30'  
 VERTICAL SCALE: 1"=3'



WET POND CROSS SECTION "C-C"

HORIZONTAL SCALE: 1"=30'  
 VERTICAL SCALE: 1"=3'

Table 3-6 Clay Liner Specifications (COA, 2004)

Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	$1 \times 10^{-6}$
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

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CENTRAL TEXAS  
 205 Cimarron Park Loop, Ste. B, Buda TX 78610  
 P: 512.312.4330

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 CHECKED BY: HJ

WET POND CROSS SECTIONS

**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001

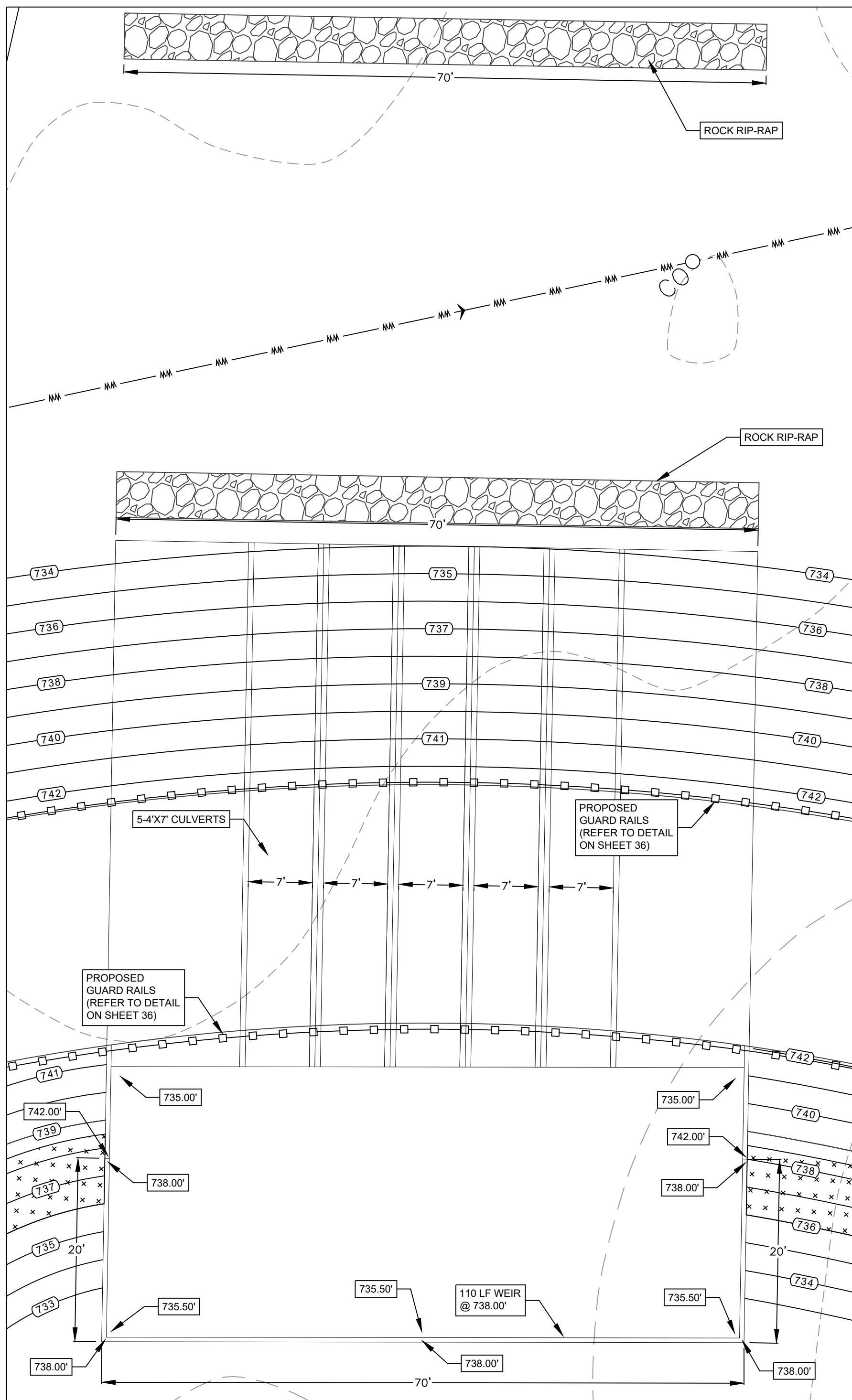
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SHEET 26 OF 36



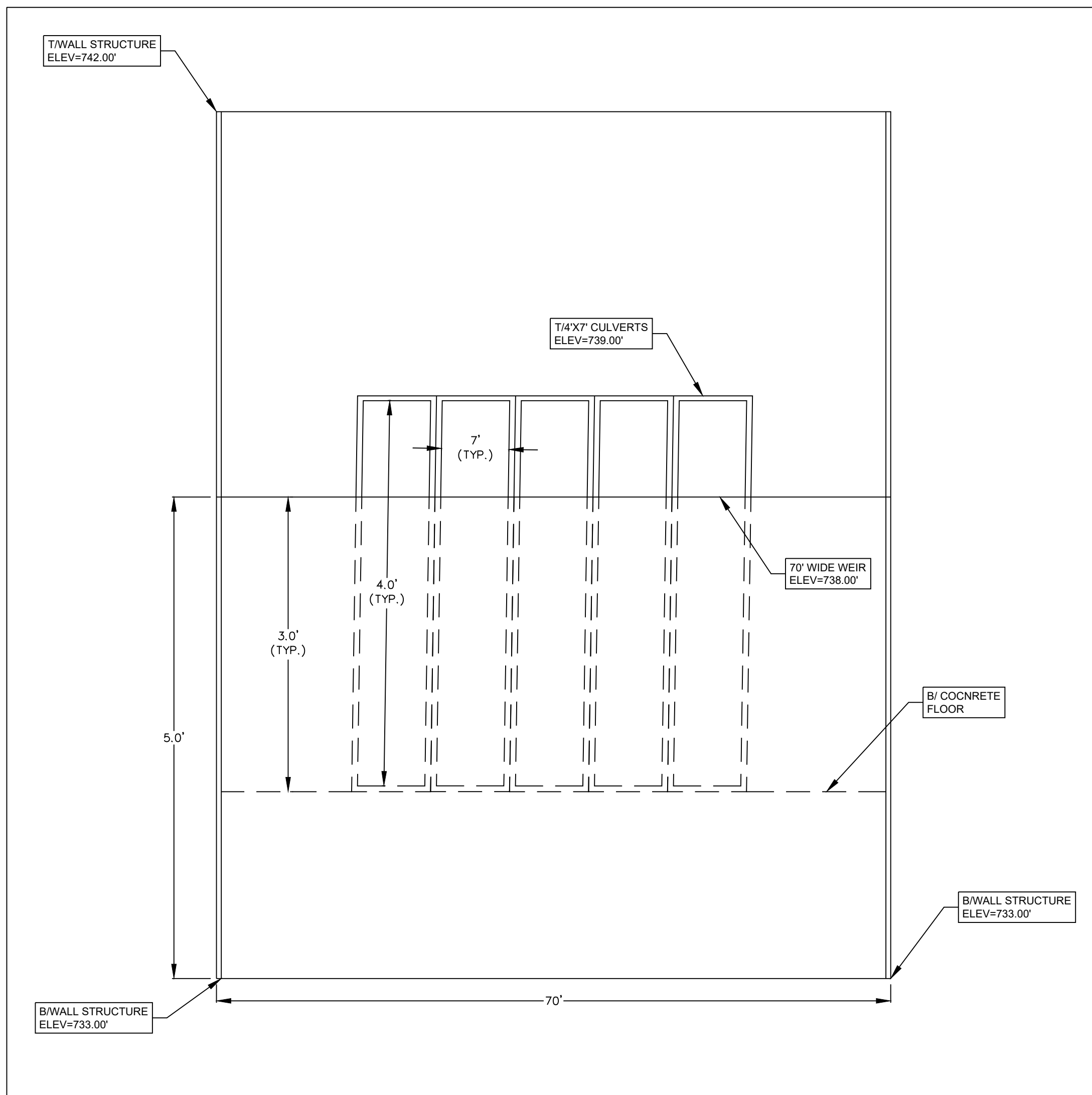
**OUTFALL STRUCTURE TOP VIEW  
(STRUCTURAL DESIGN BY OTHERS)**

HORIZONTAL SCALE: 1"=10'  
VERTICAL SCALE: 1"=10'



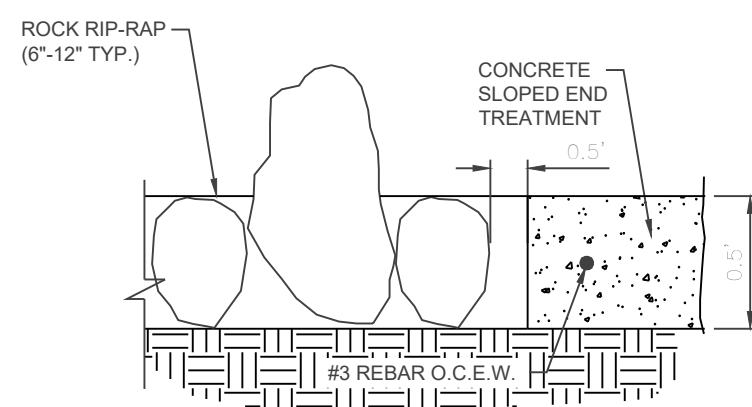
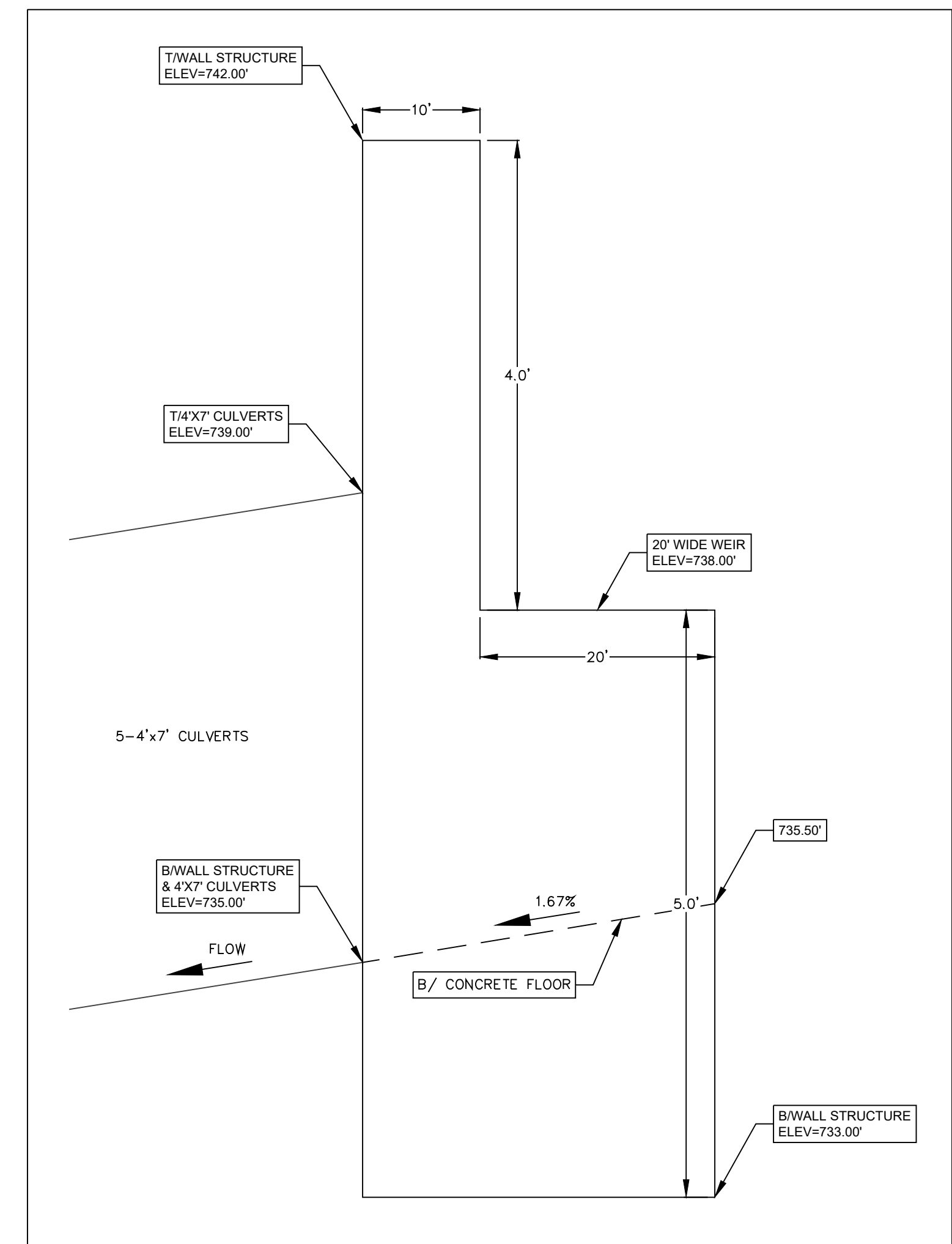
**OUTFALL STRUCTURE CROSS SECTION "D-D"  
(STRUCTURAL DESIGN BY OTHERS)**

HORIZONTAL SCALE: 1"=10'  
VERTICAL SCALE: 1"=1'



**OUTFALL STRUCTURE CROSS SECTION "E-E"  
(STRUCTURAL DESIGN BY OTHERS)**

HORIZONTAL SCALE: 1"=10'  
VERTICAL SCALE: 1"=1'



**ROCK RIP-RAP DETAIL**

**1. STONE FILL MATERIAL**

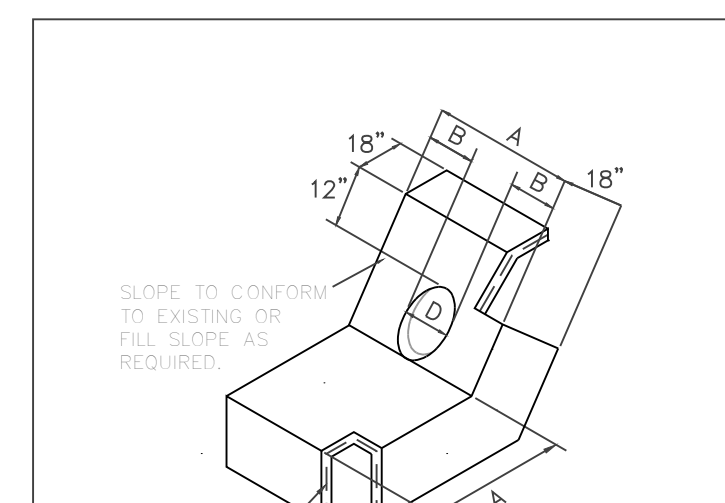
Stone fill material shall consist of hard, durable, clean stone of the size indicated, 8 to 8 inches in size or as approved by the Engineer and resistant to the action of air and water and suitable in all respects for the purpose intended.

**2. WIRE CONTAINERS**

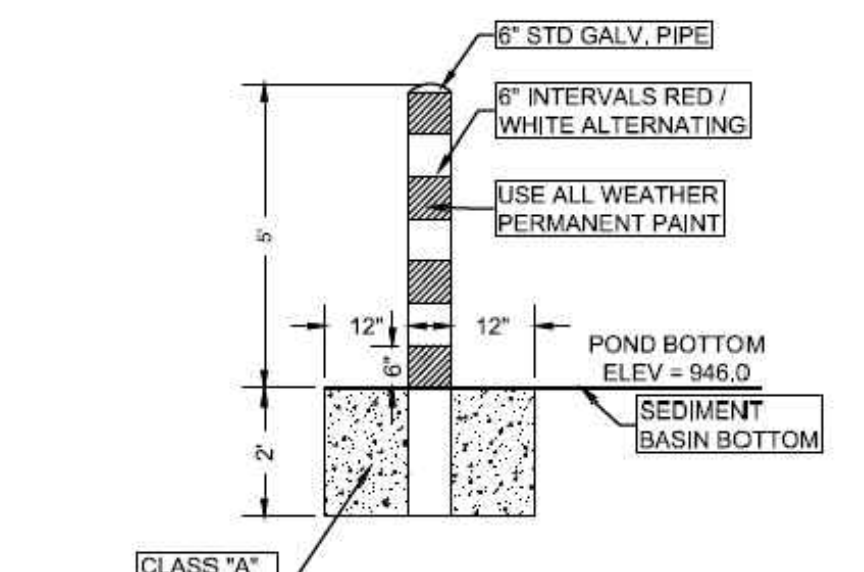
Wire mesh shall consist of plastic coated (P.V.C.) galvanized wire 0.120 inch approximately 4 inches in the longest dimension. The wire mesh is to be fabricated Class 3 unless otherwise indicated. Opening of the mesh shall not exceed in diameter minimum and shall equal or exceed Federal Specification QQ-W-461g, in such manner as to be nonraveling. Tie and connecting wire shall be of the same type and size as the baskets and shall be supplied in sufficient quantity for securely fastening all edges of the gabion and diaphragms.

**3. FILTER FABRIC**

Filter fabric shall be non-biodegradable ultraviolet resistant, inert to most soil chemicals, unaffected by moisture which allows water to pass through while retaining soil particles and shall conform to Item No. 629, "Filter Fabric".



**TYPICAL CONCRETE RIP-RAP AT PIPE**



**CONCRETE FILLED FIXED SEDIMENT MARKER FOR**

N.T.S.



TEXAS ONE CALL SYSTEM  
1-800-245-4545  
UNDER PENALTY OF LAW, THE CONTRACTOR IS REQUIRED TO CONTACT THE TEXAS ONE CALL SYSTEM AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

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CHECKED BY: HJ

OUTFALL STRUCTURE CROSS SECTIONS AND DETAILS SHEET

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

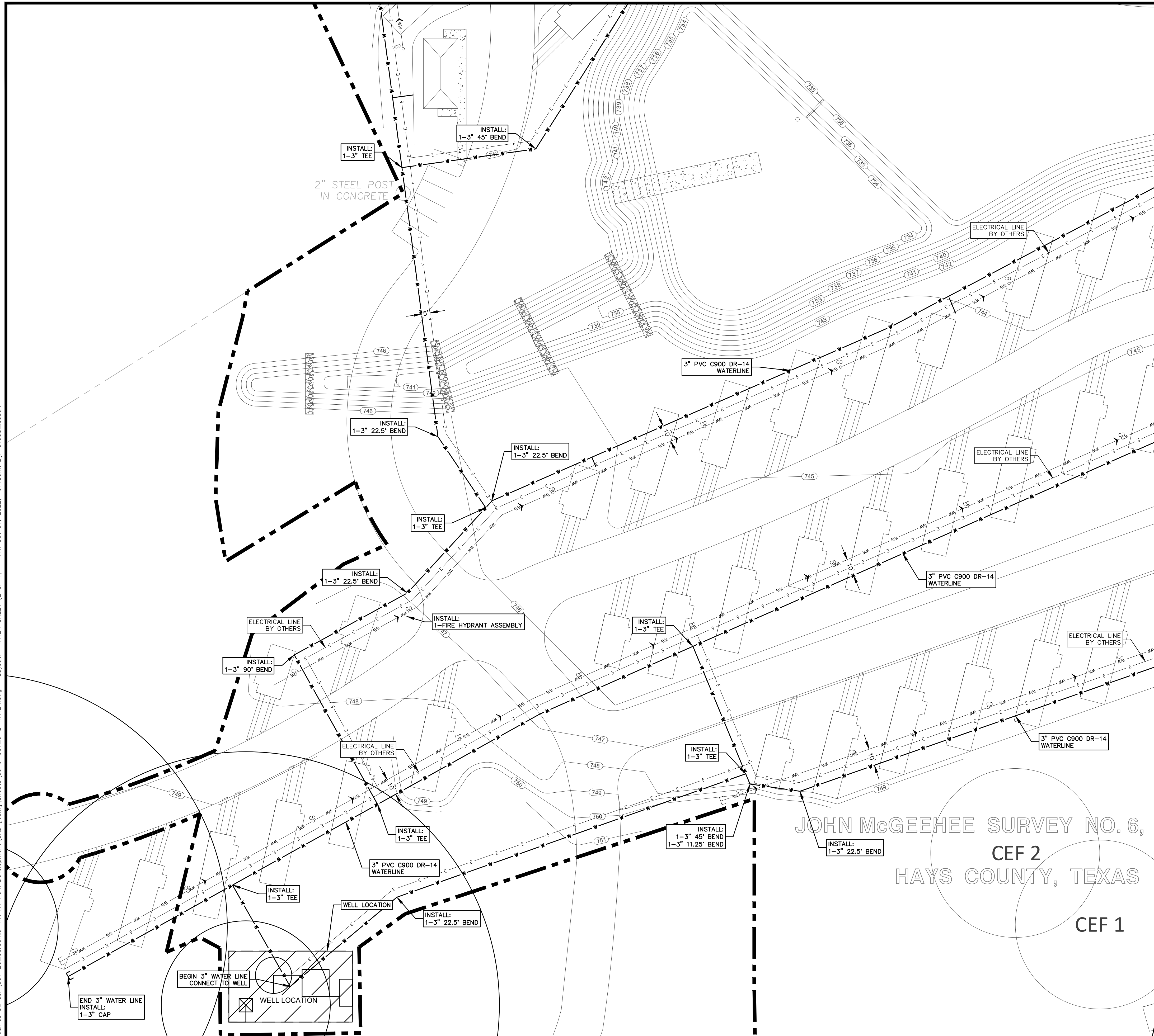
PROJECT NO.	0946-001
DRAWING NO.	
SHEET	27 OF 36





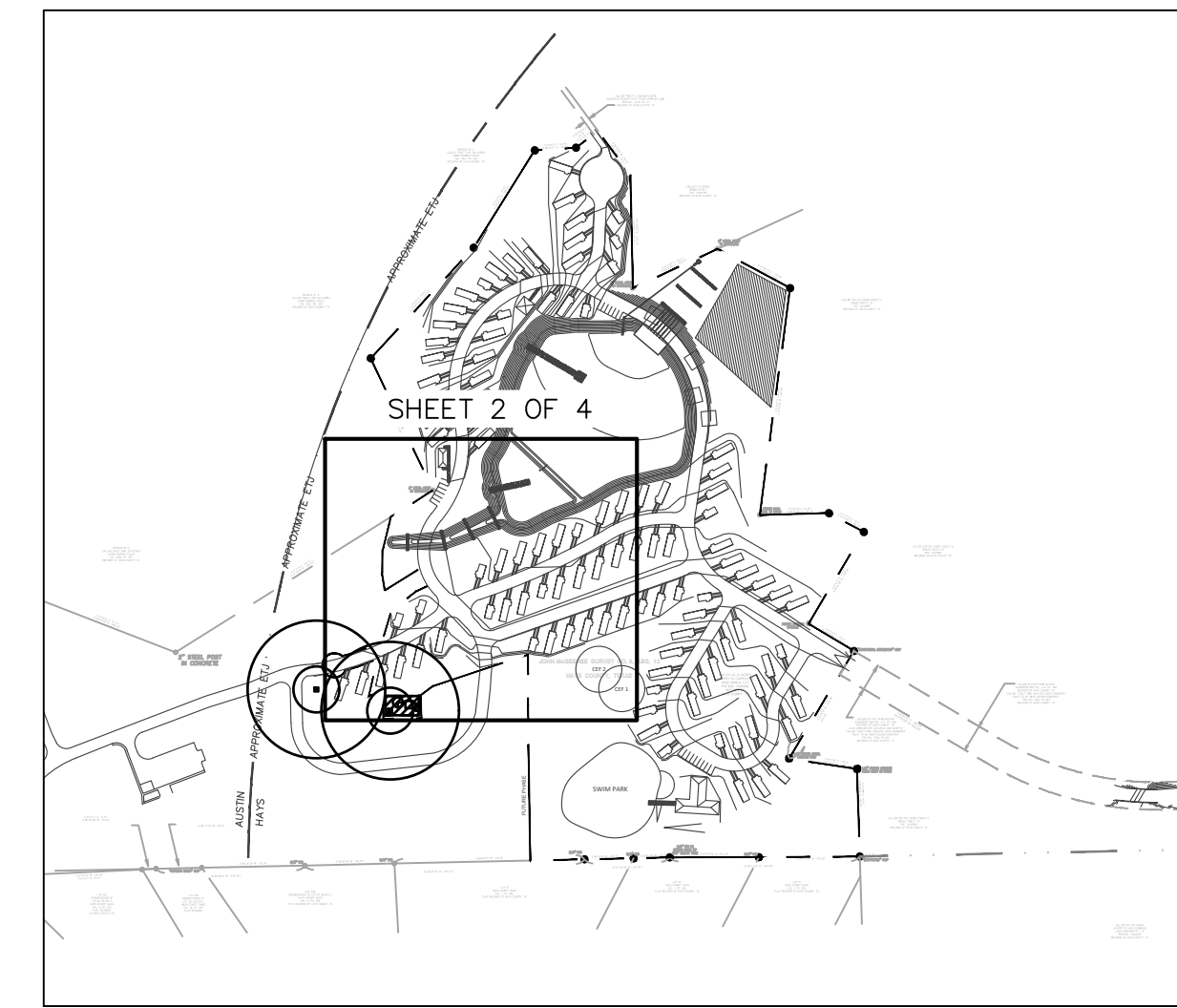
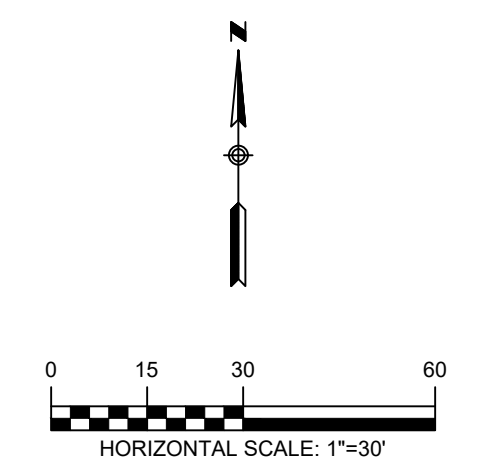


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**LEGEND**

- W — W — W — W — EXISTING WATER LINE
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- WW — WW — WW — WW — PROPOSED WASTEWATER LINE
- SD — SD — SD — SD — EXISTING STORM DRAIN LINE
- SD — SD — SD — SD — PROPOSED STORM DRAIN LINE
- G — G — G — G — EXISTING GAS LINE
- OE — OE — OE — OE — EXISTING OVERHEAD ELECTRIC LINE
- UE — UE — UE — UE — EXISTING UNDERGROUND ELECTRIC LINE
- T — T — T — T — EXISTING UNDERGROUND TELEPHONE LINE
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- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- EXISTING WATER METER
- PROPOSED WATER METER
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- ⊙ EXISTING WASTEWATER MANHOLE
- ⊙ PROPOSED WASTEWATER MANHOLE
- ⊙ EXISTING ELECTRIC MANHOLE
- ⊙ EXISTING TELEPHONE MANHOLE
- ⊙ EXISTING LIGHT POLE
- ⊙ EXISTING LIGHT POLE W/ARM
- ⊙ EXISTING UTILITY POLE
- EXISTING SIGN



KEY MAP  
1"=400'

JOHN MCGEEHEE SURVEY NO. 6,  
CEF 2  
HAYS COUNTY, TEXAS  
CEF 1

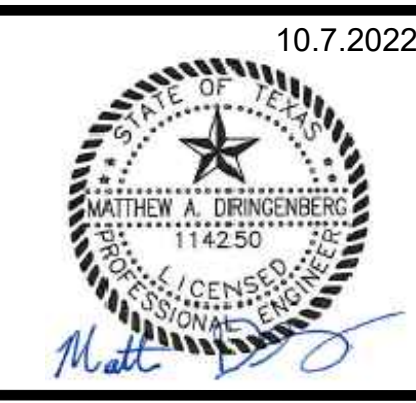
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**CENTRAL TEXAS**  
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P: 512.312.4330

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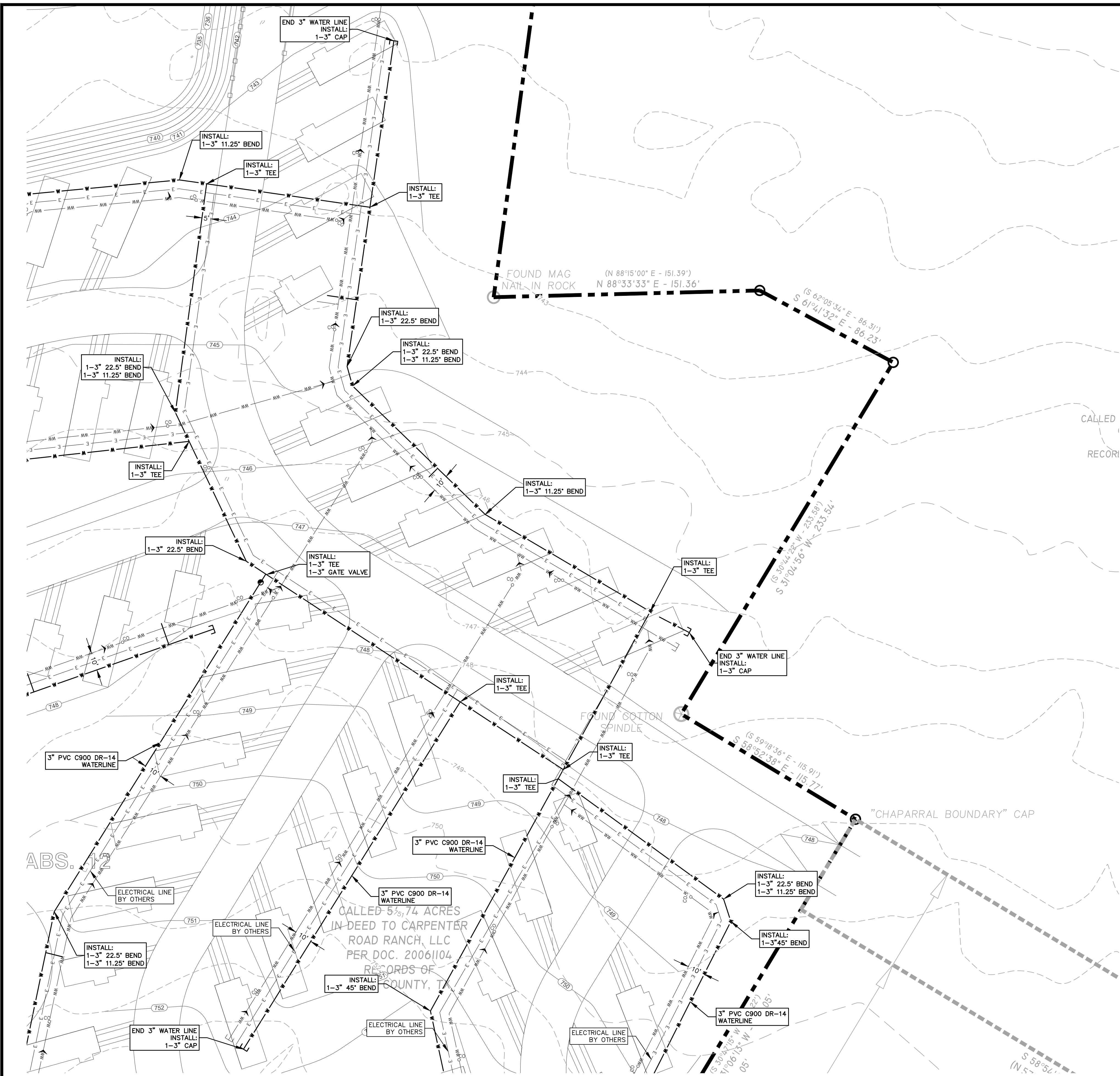
WATER SHEET (2 OF 4)

**CARPENTER RANCH RV PARK**  
584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO.	0946-001
DRAWING NO.	
SHEET	29 OF 36



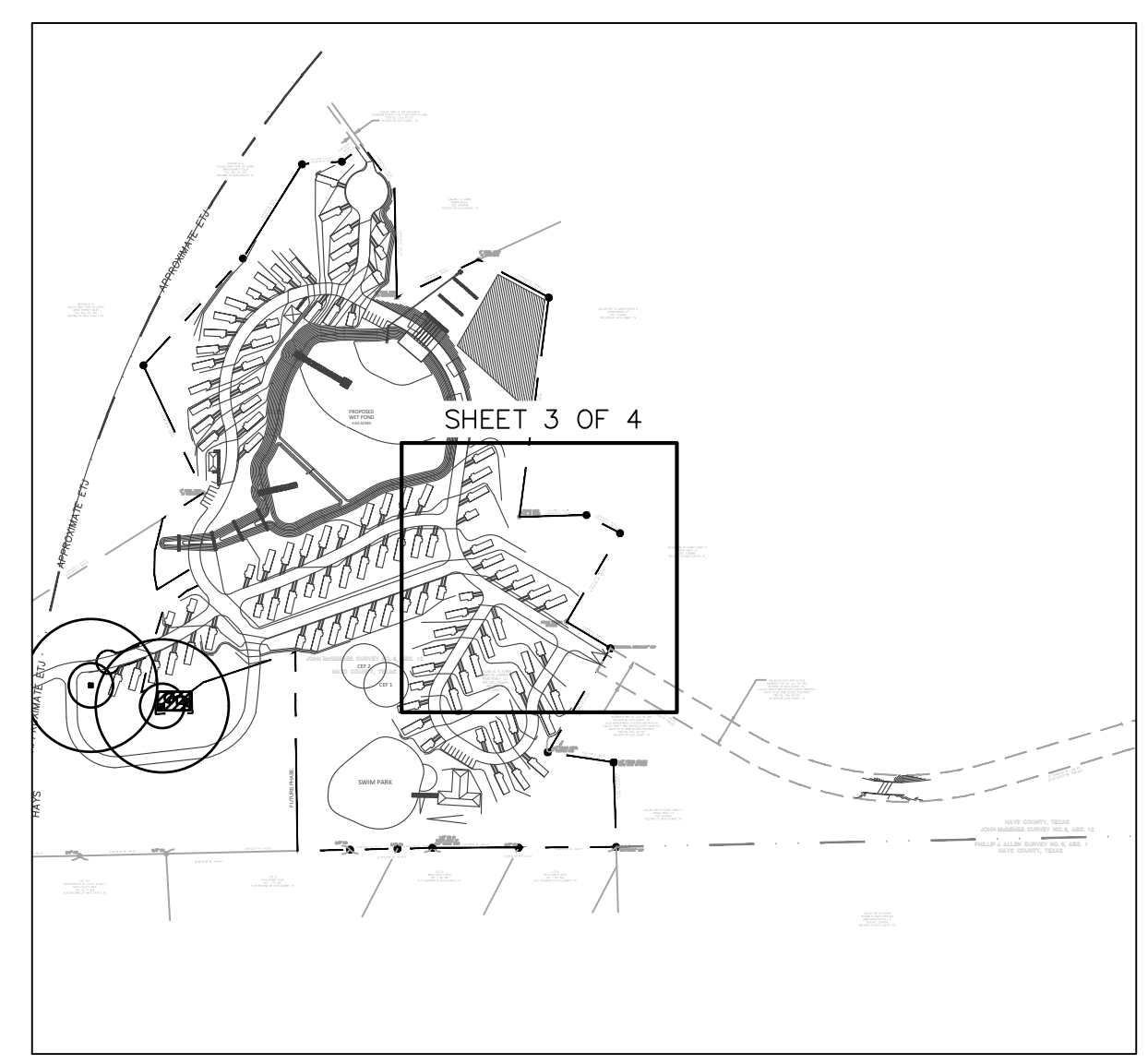
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HORIZONTAL SCALE: 1"=30'



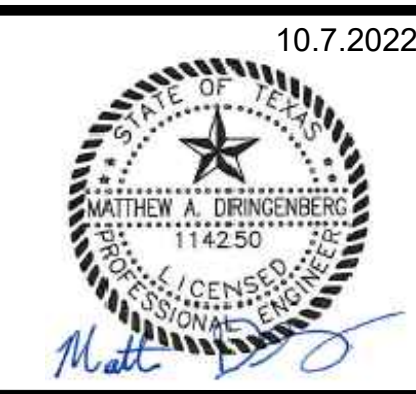
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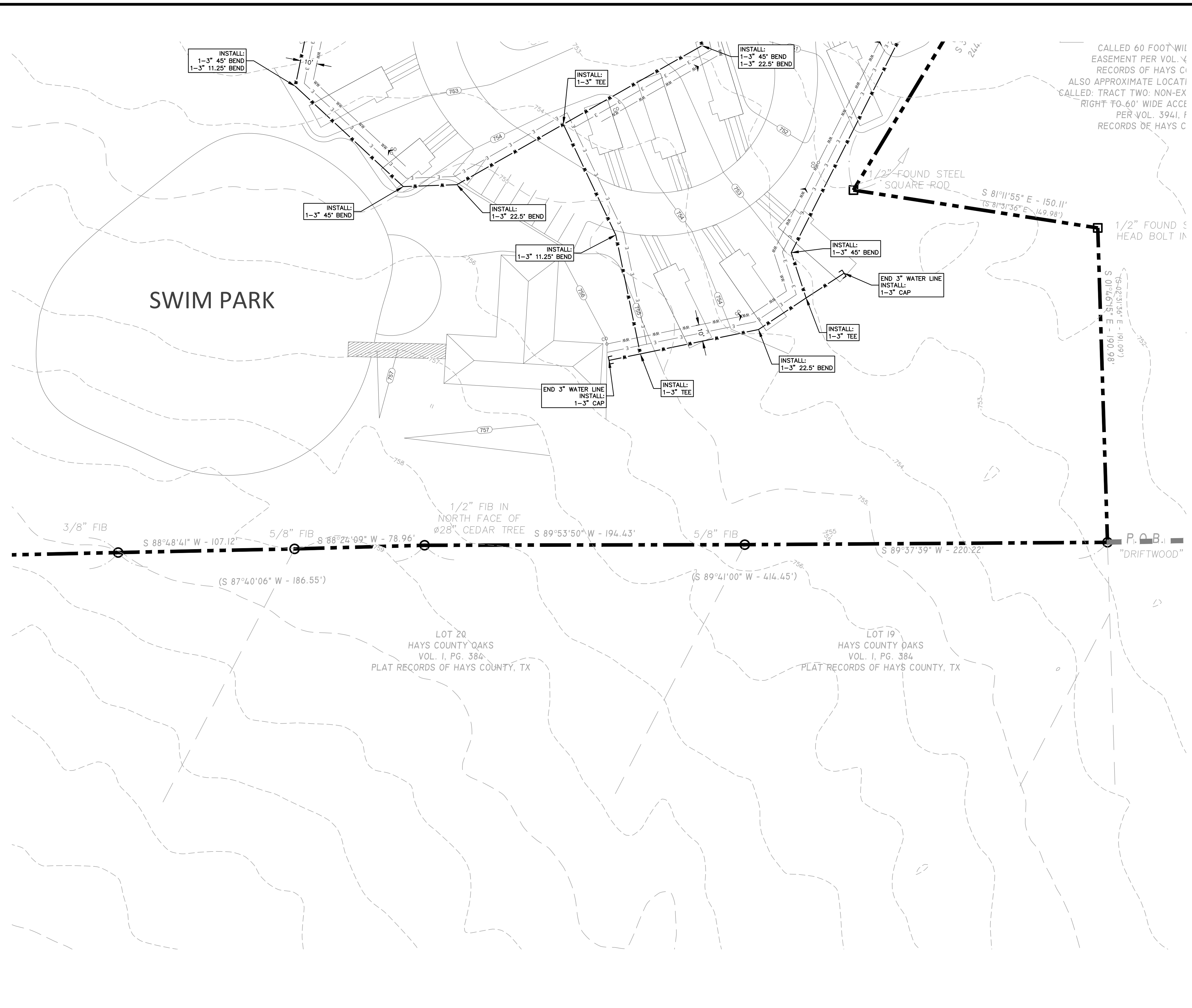
WATER SHEET (3 OF 4)

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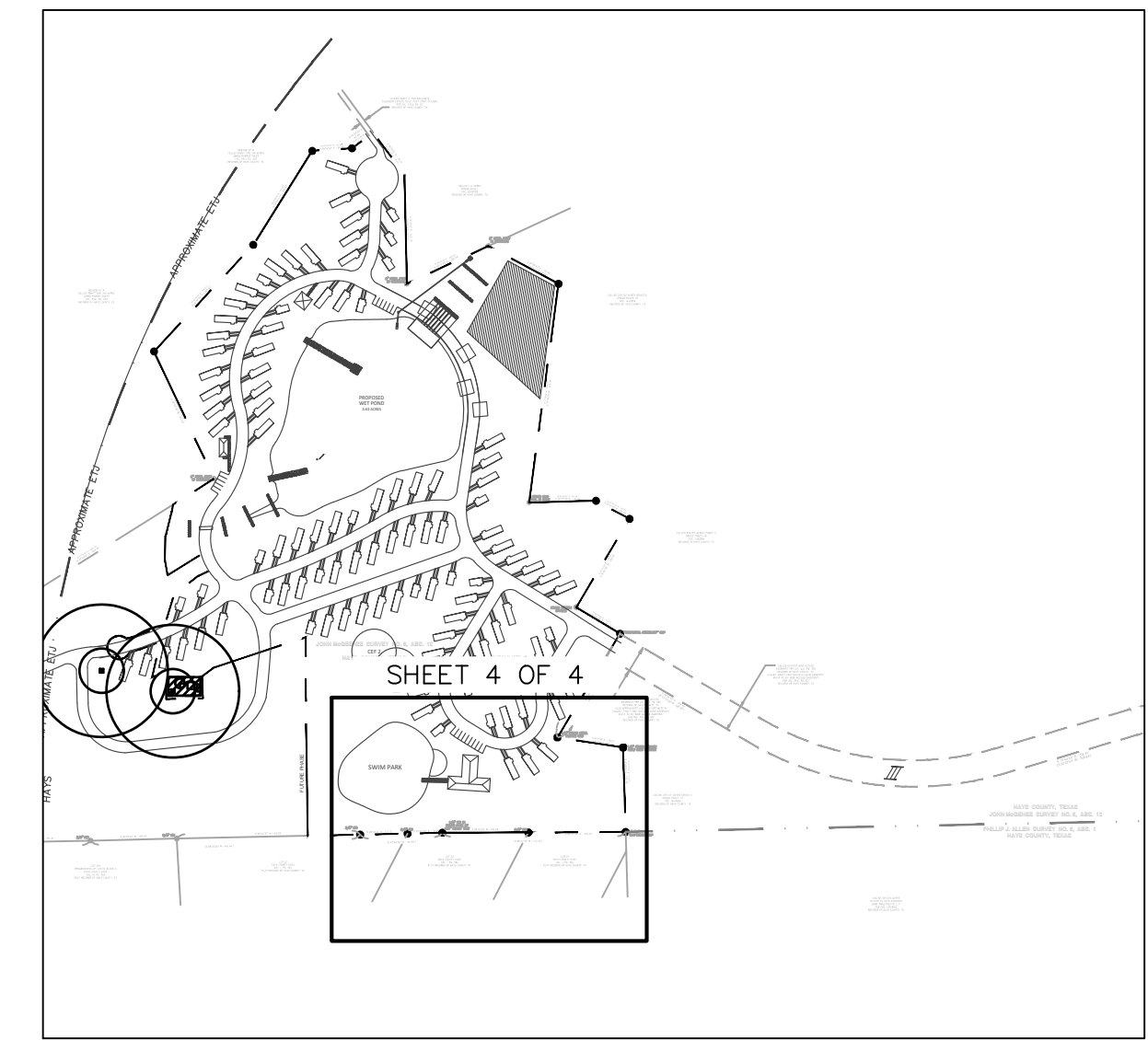
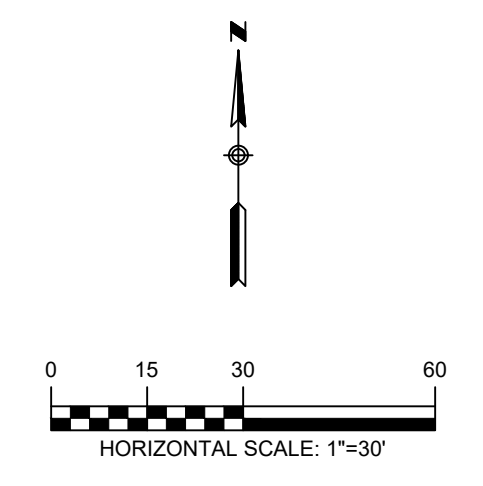
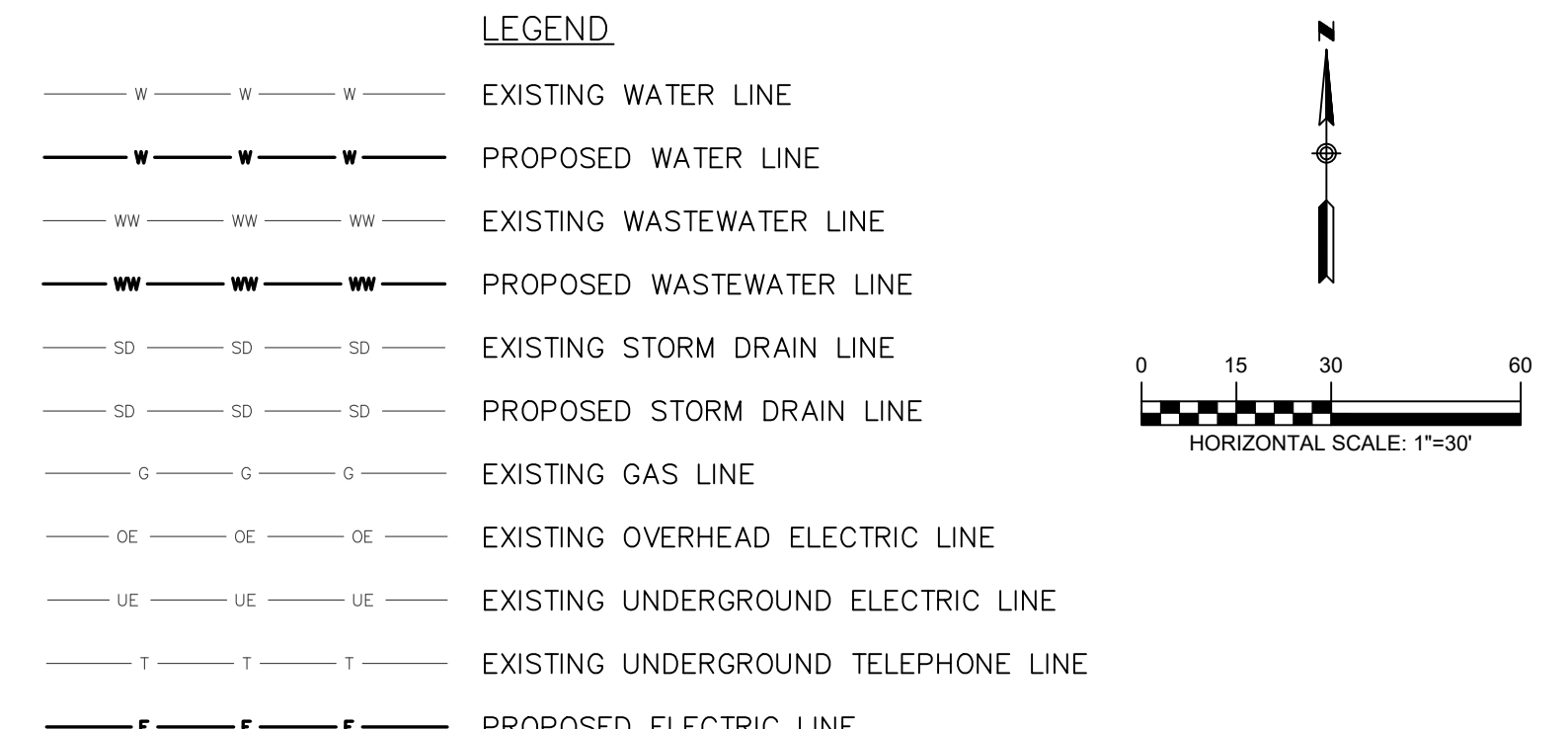
PROJECT NO.	0946-001
DRAWING NO.	
SHEET	30 OF 36



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CALLED 60 FOOT WIL  
 EASEMENT PER VOL. 4  
 RECORDS OF HAYS CO  
 ALSO APPROXIMATE LOCATI  
 CALLED: TRACT TWO: NON-EX  
 RIGHT TO 60' WIDE ACCE  
 PER VOL. 3941, F  
 RECORDS OF HAYS C



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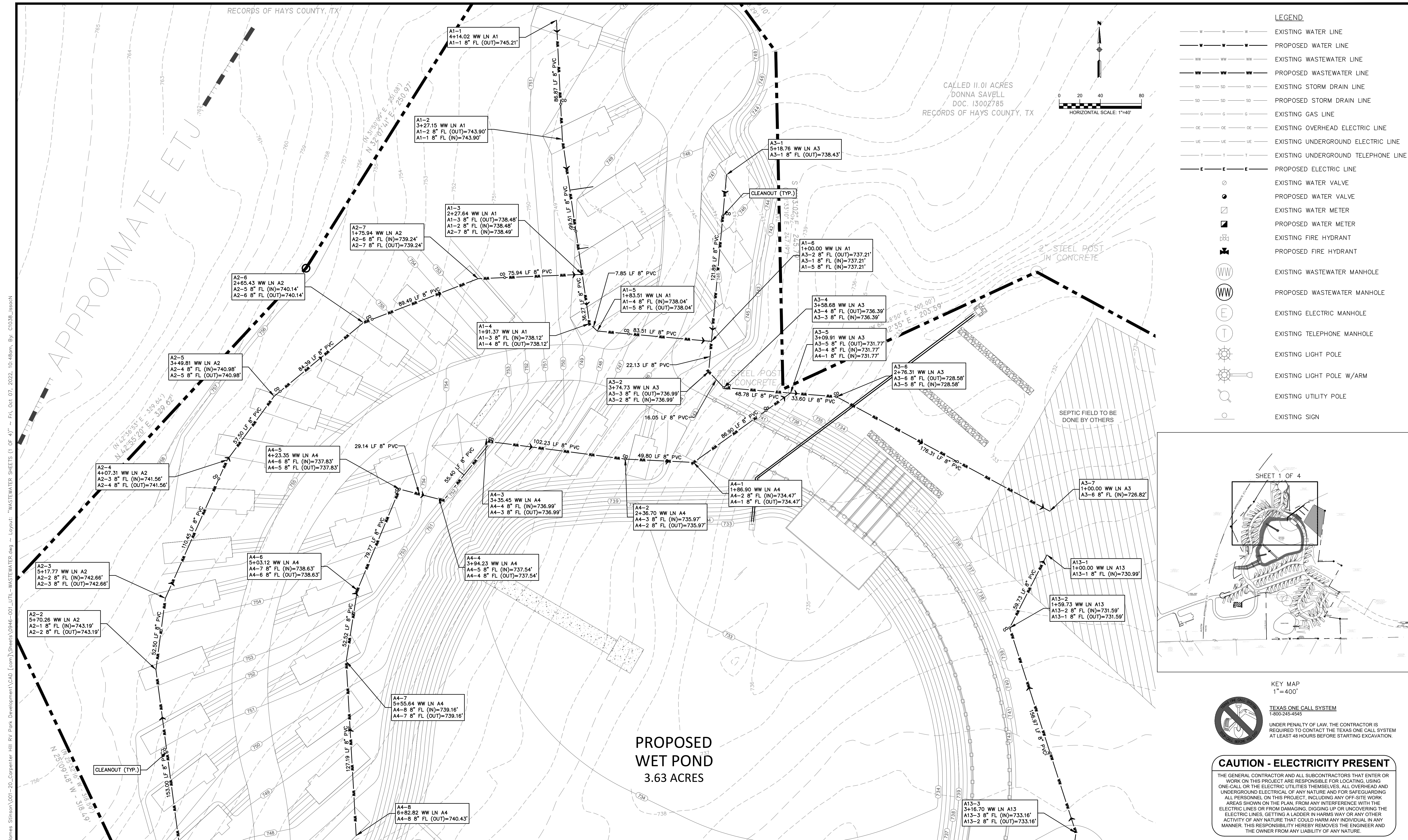
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WATER SHEET (4 OF 4)  
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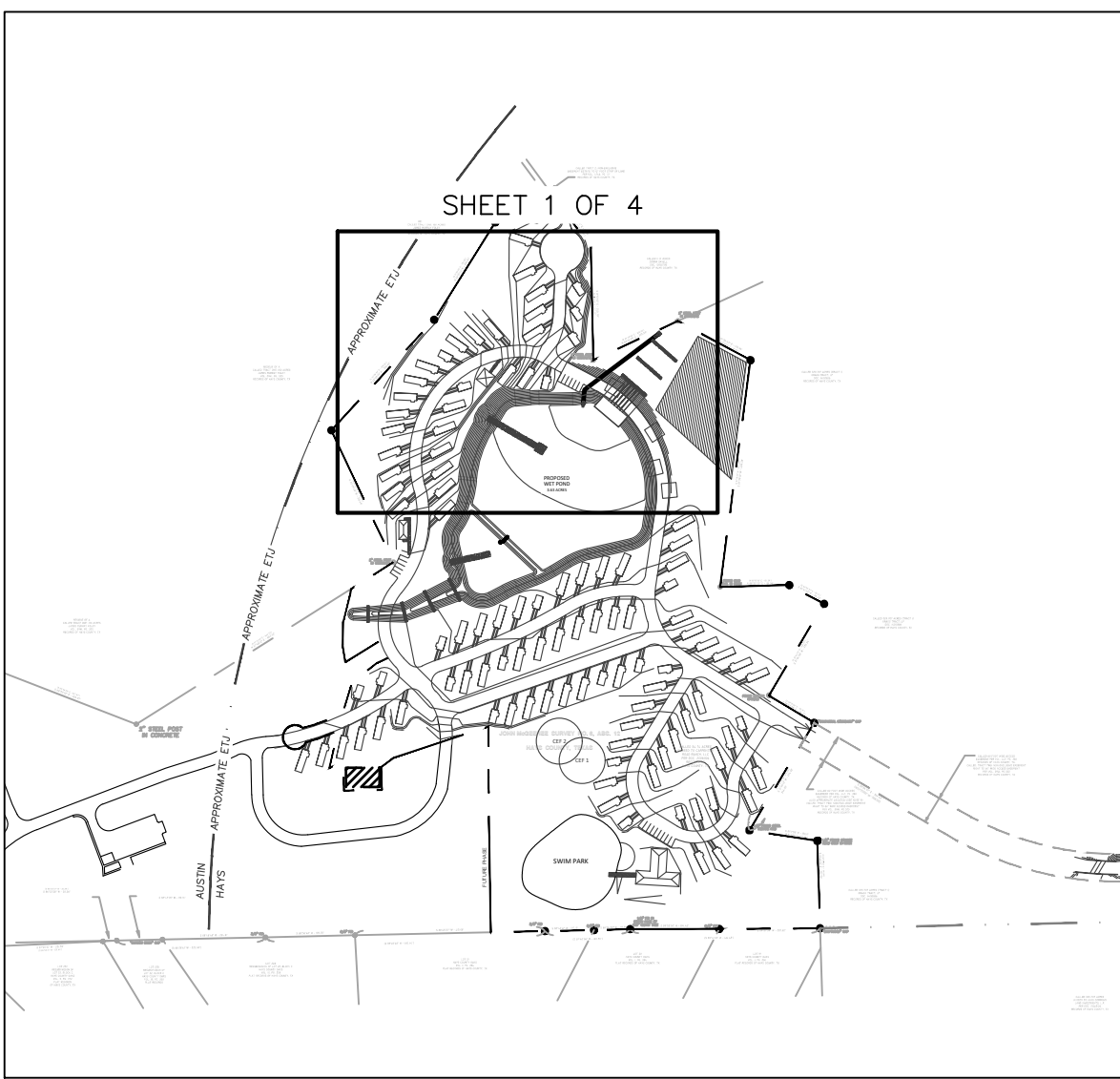
PROJECT NO.	0946-001
DRAWING NO.	
SHEET	31 OF 36





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KEY MAP  
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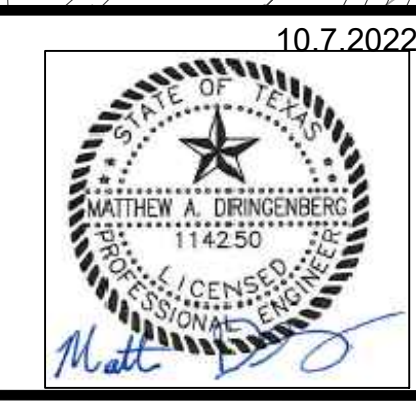
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CHECKED BY: HJ

WASTEWATER SHEETS (1 OF 4)

**CARPENTER RANCH RV PARK**  
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PROJECT NO. 0946-001

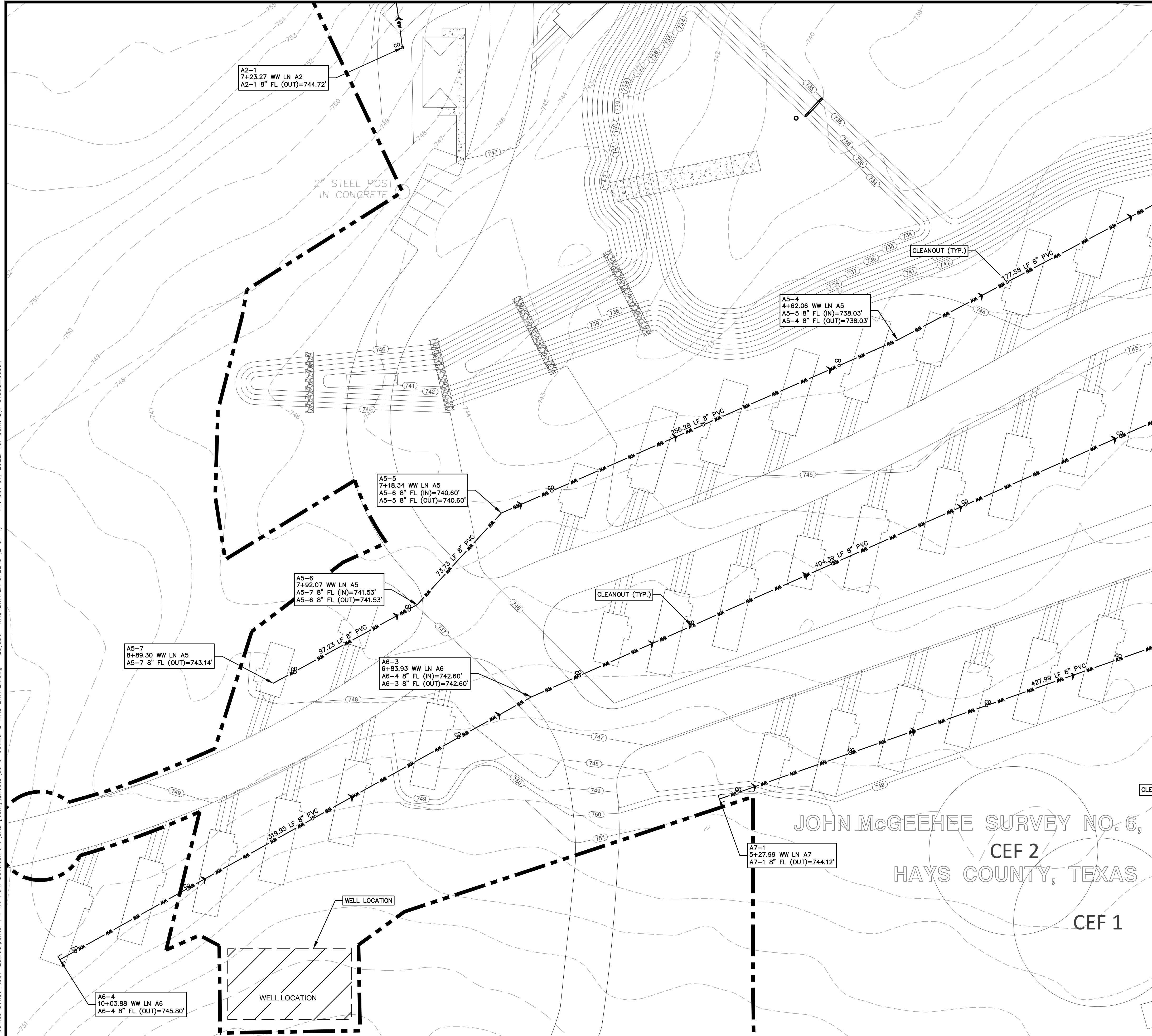
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SHEET 32 OF 36

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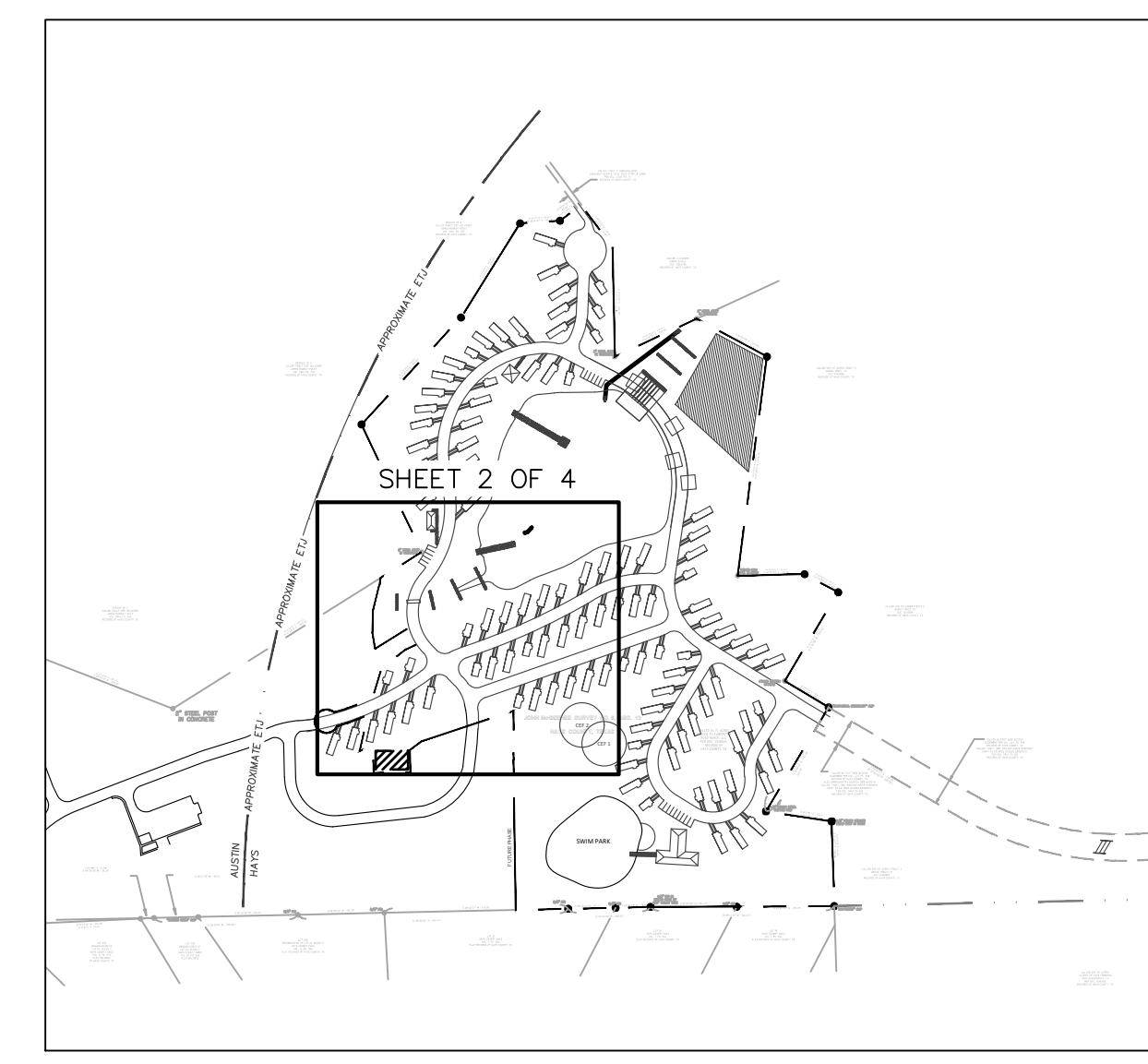
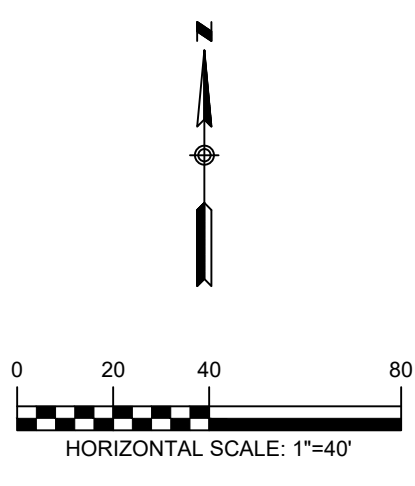


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**LEGEND**

- W — W — W — W — EXISTING WATER LINE
- W — W — W — W — PROPOSED WATER LINE
- WW — WW — WW — WW — EXISTING WASTEWATER LINE
- WW — WW — WW — WW — PROPOSED WASTEWATER LINE
- SD — SD — SD — SD — EXISTING STORM DRAIN LINE
- SD — SD — SD — SD — PROPOSED STORM DRAIN LINE
- G — G — G — G — EXISTING GAS LINE
- OE — OE — OE — OE — EXISTING OVERHEAD ELECTRIC LINE
- UE — UE — UE — UE — EXISTING UNDERGROUND ELECTRIC LINE
- T — T — T — T — EXISTING UNDERGROUND TELEPHONE LINE
- E — E — E — E — PROPOSED ELECTRIC LINE
- EXISTING WATER VALVE
- PROPOSED WATER VALVE
- EXISTING WATER METER
- PROPOSED WATER METER
- ⊕ EXISTING FIRE HYDRANT
- ⊕ PROPOSED FIRE HYDRANT
- ⊙ EXISTING WASTEWATER MANHOLE
- ⊙ PROPOSED WASTEWATER MANHOLE
- ⊙ EXISTING ELECTRIC MANHOLE
- ⊙ EXISTING TELEPHONE MANHOLE
- ⊙ EXISTING LIGHT POLE
- ⊙ EXISTING LIGHT POLE W/ARM
- ⊙ EXISTING UTILITY POLE
- EXISTING SIGN



JOHN MCGEEHEE SURVEY NO. 6,  
 CEF 2  
 HAYS COUNTY, TEXAS  
 CEF 1

**TEXAS ONE CALL SYSTEM**  
 1-800-245-4545  
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 AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

**CAUTION - ELECTRICITY PRESENT**  
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 UNDERGROUND ELECTRICAL OF ANY NATURE AND FOR SAFEGUARDING  
 ALL PERSONNEL ON THIS PROJECT, INCLUDING ANY OFF-SITE WORK  
 AREAS SHOWN ON THE PLAN, FROM ANY INTERFERENCE WITH THE  
 ELECTRIC LINES OR FROM DAMAGING, DIGGING UP OR UNCOVERING THE  
 ELECTRIC LINES. GETTING A LADDER IN HARMS WAY OR ANY OTHER  
 ACTIVITY OF ANY NATURE THAT COULD HARM ANY INDIVIDUAL IN ANY  
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NO.	REVISION	DATE

10.7.2022  
  
 Matthew A. Dringenberg, P.E.

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 TBPE NO. F-1909  
 www.swengineers.com

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 307 Saint Lawrence Street, Gonzales TX 78629  
 P: 830.672.7546 F: 830.672.2034  
**CENTRAL TEXAS**  
 205 Cimarron Park Loop, Ste. B, Buda TX 78610  
 P: 512.312.4330

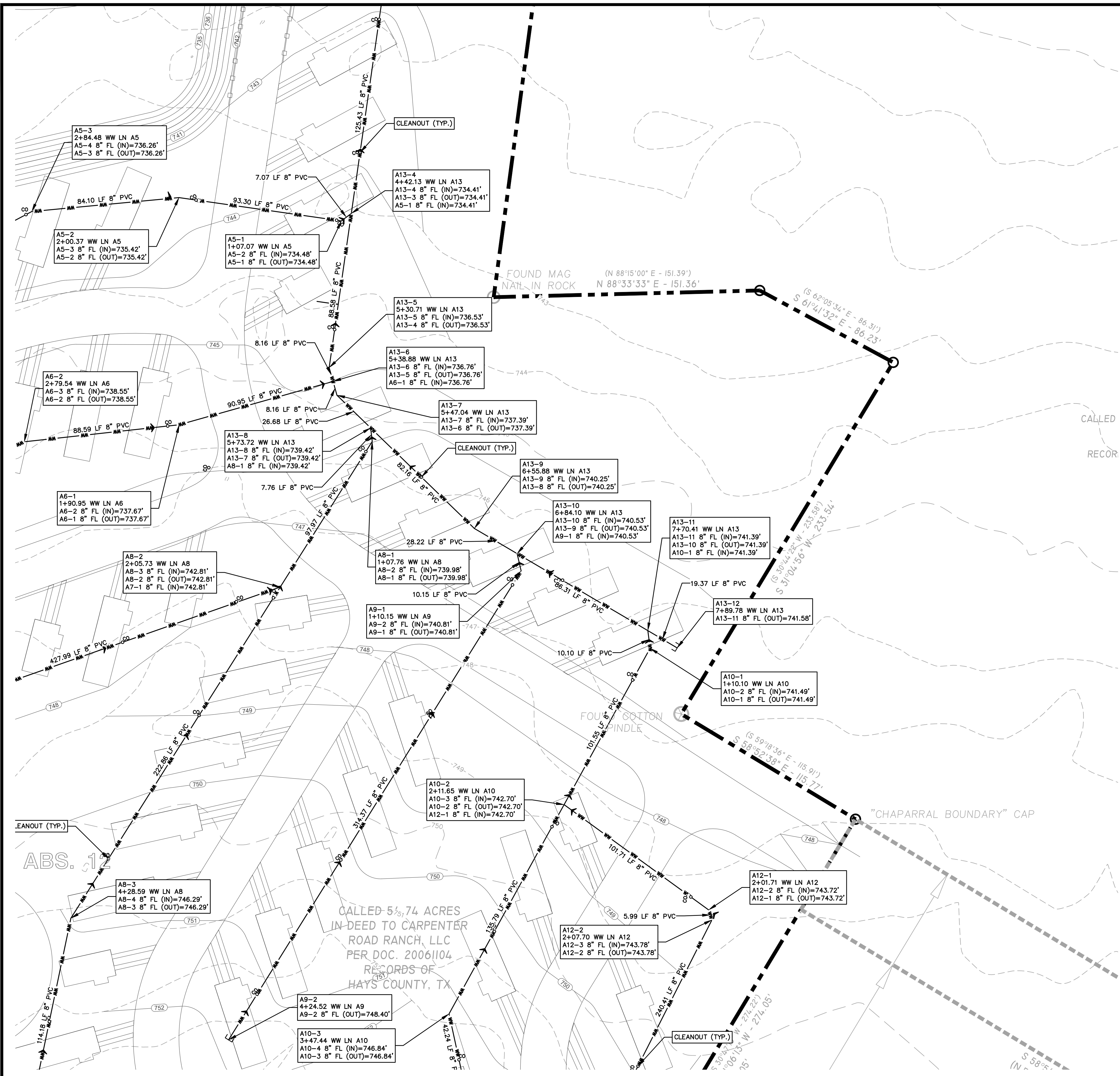
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 IF THIS BAR DOES NOT MEASURE 1"  
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 DRAWN BY: AL  
 CHECKED BY: HJ

WASTEWATER SHEETS (2 OF 4)  
**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001
DRAWING NO. _____
SHEET 33 OF 36

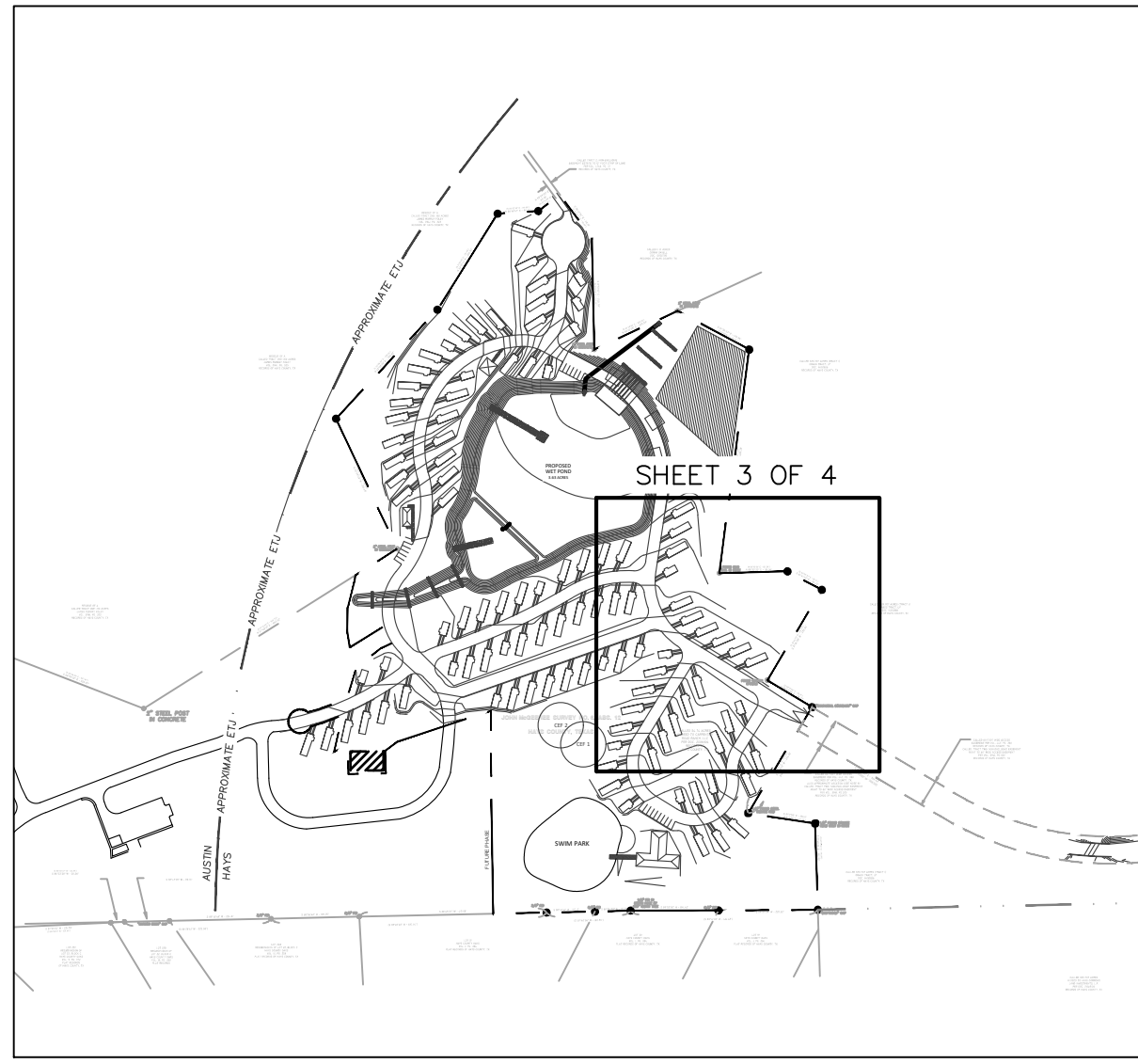
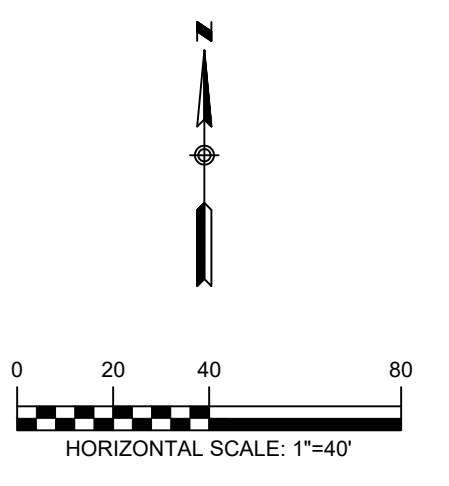


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**LEGEND**

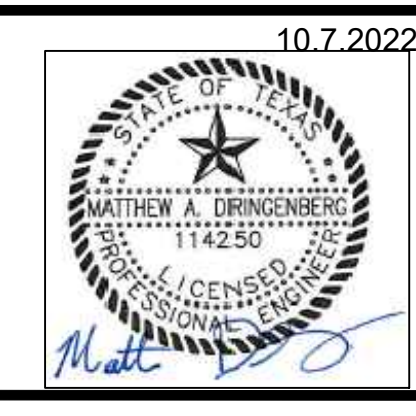
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NO.	REVISION	DATE



10.7.2022  
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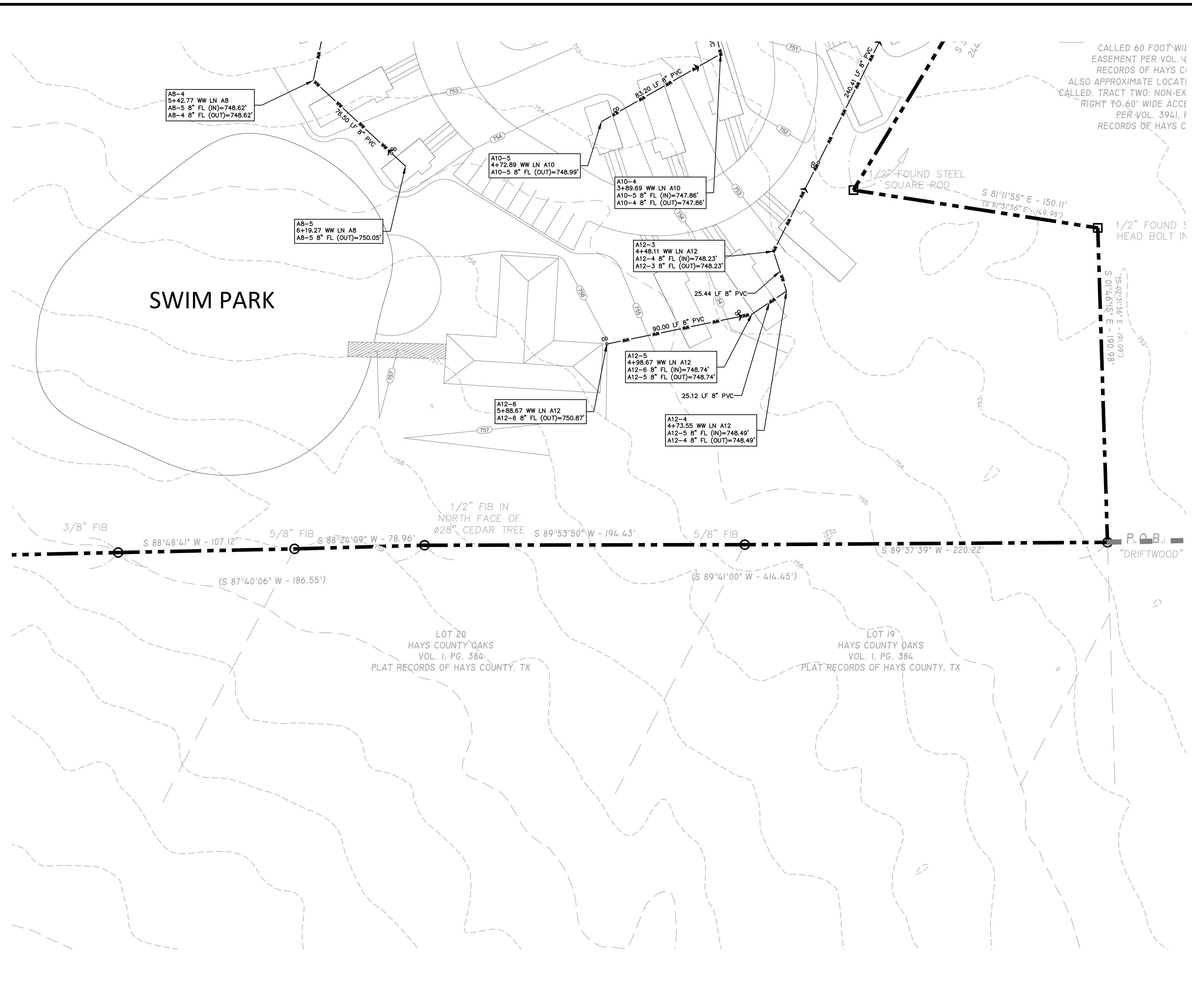
**WARNING**  
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WASTEWATER SHEETS (3 OF 4)  
**CARPENTER RANCH RV PARK**  
 584 MCKINNON LOOP BUDA, TEXAS 78610

PROJECT NO. 0946-001  
 DRAWING NO. \_\_\_\_\_  
 SHEET 34 OF 36

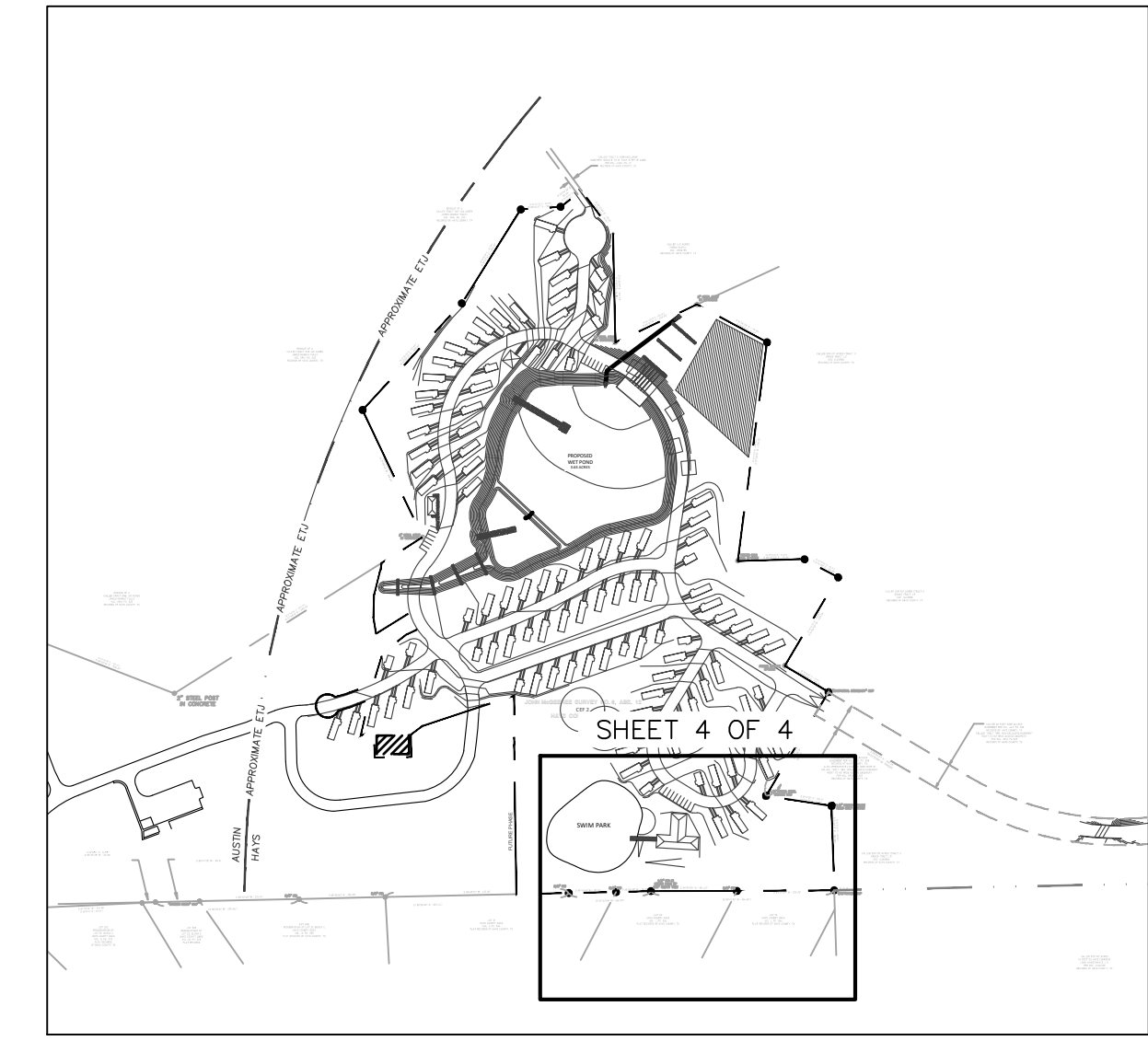
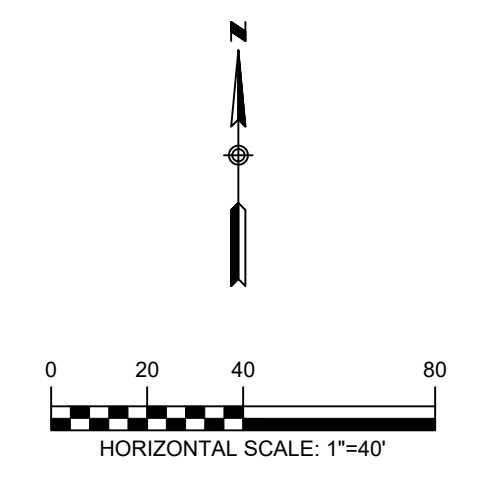


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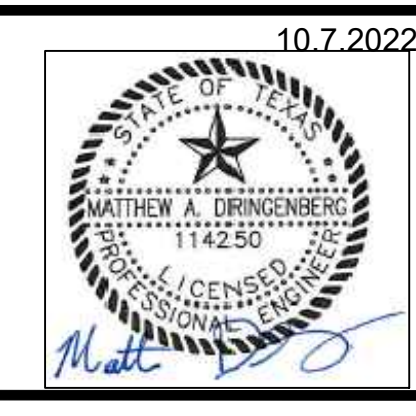


KEY MAP  
1" = 400'

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WASTEWATER SHEETS (4 OF 4)  
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PROJECT NO. 0946-001
DRAWING NO. _____
SHEET 35 OF 36



