THE COUNTY OF GALVESTON

RUFUS G. CROWDER, CPPO, CPPB
PURCHASING AGENT

GWEN MCLAREN, CPPB
ASST. PURCHASING AGENT

COUNTY COURTHOUSE
722 Moody (21st Street)
Fifth (5th) Floor
GALVESTON, TEXAS 77550
(409) 770-5371

July 22, 2019

PROJECT NAME: Paul Hopkins Park Pedestrian Bridge

SOLICITATION NO: B191052

RE: ADDENDUM #1

To All Prospective Bidders:

The following information is being provided to aid in preparation of your bid submittal(s)

Revised Procurement Timeline:

The timeline for Bid #B191052, Paul Hopkins Park Pedestrian Bridge has been revised:

- **Pre-Bid Meeting** — **Friday, July 26, 2019 at 9:00 a.m.**
  Paul Hopkins Park
  1000 A FM 517
  Dickinson, TX 77539
  (Heading East on FM 517, turn right at park entrance right before Tallow Drive. Meet at the pavilion near the parking lot. Contact 409.526.6375)
- **Questions Deadline** — **Wednesday, July 31, 2019 by 5:00 p.m.**
- **RFP Opening** — **Friday, August 9, 2019 at 2:00 p.m.**

Question #1: ***Do you have an engineers estimate for bid bond purposes?***

Response: Yes. The base bid is approximately $230,000. The alternate item is $10,000.

Question #2: ***On sheet 56, Detain 2, what size is the Vertical Steel Tube and truss members to be:***

Response: The Vertical Steel Tube and truss members are to be sized per bridge manufacturer's structural engineer.

Question #3: ***Will the bid date be extended because of pre-bid?***

Response: Yes. Please refer to the Revised Procurement Timeline above.

Question #4: ***When is the Pre-bid?***

Response: Please refer to the Revised Procurement Timeline above.

Question #5: ***The wage scale included in the bid documents is for Construction Type: Building. This is not building work, and this work is typically classified as Construction Type: Heavy. Will the county consider or accept the Construction Type: Heavy wage scale based on the nature of the work?***

Response: New wage rates will be considered following the onsite pre-bid meeting..

Question #6: ***Have there been any other questions submitted and answered? If so, will you provide the questions and answers?***

Response: All questions received are included in this addendum.

Question #7: ***There is mention of a geotechnical report, but it does not appear to have been provided. IF available, will you provide for review?***

Response: Yes, please refer to Attachment A.

Question #8: ***Is the current depth of the channel known?***

Response: As shown on the drawings, the bottom of channel is assumed to be around elevation -4.0'.

As a reminder, all questions regarding this bid must be submitted in writing to:

Rufus G. Crowder, CPPO CPPB
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
E-mail: purchasing.bids@co.galveston.tx.us

If you have any further questions regarding this bid, please address them to Rufus Crowder, CPPO CPPB, Purchasing Agent, via e-mail at purchasing.bids@co.galveston.tx.us, or contact the Purchasing Department at (409) 770-5371.

Please excuse us for any inconvenience that this may have caused.

Sincerely,

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

ATTACHMENT A

GEOTECHNICAL INVESTIGATION
GALVESTON COUNTY DAMAGE ASSESSMENTS
PEDESTRIAN BRIDGE REPLACEMENT
AT PAUL HOPKINS PARK
GALVESTON COUNTY, TEXAS

REPORT NO. 1140243401

Reported to:

HUITT-ZOLLARS, INC.

Houston, Texas

Submitted by:

GEOTEST ENGINEERING, INC.

Houston, Texas

Key Map Nos. 699 G

GEOTEST ENGINEERING, INC.

Geotechnical Engineers & Materials Testing

5600 Bintliff Drive Houston, Texas 77036 Telephone: (713) 266-0588
Fax: (713) 266-2977

Report No. 1140243401
July 16, 2019

Mr. B. Frank Andrews, P.E.
Associate
Huitt-Zollars, Inc.
2929 Highway 6, Suite 300
Bayou Vista, Texas 77563

Reference: **Geotechnical Investigation**
Galveston County Damage Assessments
Pedestrian Bridge Replacement at Paul Hopkins Park
Galveston County, Texas

Dear Mr. Andrews:

Presented herein is the final geotechnical investigation report for the referenced project. Preliminary boring logs and preliminary axial-capacity curves were submitted to you on May 9, 2019. A draft report was submitted to you on June 19, 2019. This final report supersedes all previously submitted e-mails, transmittals, reports, etc. for the referenced project. This investigation was authorized by Supplement No. 2 to Sub-Consultant Services Agreement (dated December 11, 2018) on April 5, 2019, by accepting our Proposal No. 1140451899 dated March 22, 2019.

We appreciate this opportunity to be of service to you. Please call us when we can be of further assistance.

Sincerely,
GEOTEST ENGINEERING, INC.
TBPE Registration No. F-410

Krishna M. Pradeep, E.I.T.
Graduate Engineer

B. C. 15 7/16/19

Mohan Ballagere, P.E.
Vice President

STATE OF TEXAS
MOHAN BALLAGERE
87622
LICENSED
PROFESSIONAL ENGINEER

MB\KMP\ego
Copies Submitted: (2+1-pdf)
PC38\Geotechnical\40243401F.DOC

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EXECUTIVE SUMMARY

A geotechnical investigation was conducted in connection with the design and construction of the proposed pedestrian bridge replacement at Paul Hopkins Park, for the Galveston County Damage Assessments project in Galveston County, Texas.

The project consists of design and reconstruction of the existing pedestrian bridge crossing Magnolia Bayou at Paul Hopkins Park, located at 1000 FM 517 in Dickinson, Texas. Based on the information provided, it is our understanding that the existing wooden pedestrian bridge would be replaced with new bridge supports in the vicinity of the existing bridge. The proposed pedestrian bridge is approximately 130-foot long, and will be supported on 16-inch square concrete pile foundation. The channel depth at the crossing is less than 10 feet below top of the bank.

The scope of this investigation included drilling and sampling of a total of two (2) soil borings each to a depth of 60 feet, performing laboratory tests on samples recovered from the borings, performing engineering analyses to develop geotechnical recommendations and preparing a geotechnical investigation report.

The principal findings and conclusions developed from this investigation are summarized as follows:

- Based on the available information from U.S. Geological Survey (USGS) Maps and information contained in Geotest Library relating to geologic faults, no known documented faults exist within the project area.

- The subsurface soils beneath the existing grade as encountered in borings GB-1 and GB-2 consist of predominantly cohesive soils to the explored depth of 60 feet. The cohesive soils consisting of medium stiff to hard dark brown, gray, yellowish brown and reddish brown fat clay, fat clay with sand, lean clay, lean clay with sand, and sandy lean clay. A stratum of medium dense yellowish brown sandy silt was encountered between the depths

of 8 feet and 13 feet in boring GB-1, and a stratum of yellowish brown and gray clayey sand, and brown silty sand was encountered between depths of 8 and 12 feet in boring GB-2. Fill material consisting of stiff to very stiff dark brown fat clay with sand seams, calcareous nodules and grass roots was encountered to a depth of 2 feet in all the borings.

- During the drilling operation, water was first encountered at a depth of 10.0 feet in borings GB-1 and GB-2. The water level measured 20 minutes after water was first encountered was at depths ranging from 3.5 feet to 4.4 feet, and the water level measured 24 hours after the completion of drilling was at depths ranging from 2.5 to 2.7 feet in these borings.

- Recommendations for pedestrian bridge crossing at Paul Hopkins Park, supported on 16-inch square driven piles for Galveston County Damage assessments Project are included in Section 5.2 of this report.

1.0 INTRODUCTION

1.1 General

Huitt-Zollars, Inc. (HZ) was selected by Galveston County for the design of proposed pedestrian bridge replacement at Paul Hopkins Park, for the Galveston County Damage Assessments project in Galveston County, Texas. Geotest Engineering, Inc. (Geotest) was in-turn retained by HZ to perform geotechnical investigation services for the referenced project.

1.2 Authorization

This investigation was authorized by Supplement No. 2 to Sub-Consultant Services Agreement (dated December 11, 2018) on April 5, 2019, by accepting our Proposal No. 1140451899 dated March 22, 2019.

1.3 Location and Description of the Project

The project consists of design and reconstruction of the existing pedestrian bridge crossing Magnolia Bayou at Paul Hopkins Park, located at 1000 FM 517 in Dickinson, Texas. The project location is bounded by Bayou Circle to the south-west, and Tallow Drive to the north-east in Galveston County, Texas, within the Key Map Page No. 699 Grid G.

Based on the information provided, it is our understanding that the existing wooden pedestrian bridge would be replaced with new bridge supports in the vicinity of the existing bridge. The proposed pedestrian bridge is approximately 130-foot long, and will be supported on 16-inch square concrete pile foundation. The channel depth at the crossing is less than 10 feet below top of the bank.

A vicinity map is presented on Figure 1.

1.4 Purpose and Scope

The purposes of this investigation were to explore the subsurface soil and water level conditions at the existing bridge crossing location at Magnolia Bayou in Paul Hopkins Park, and to develop geotechnical recommendations pertinent to the design and construction of the proposed pedestrian bridge replacement. The scope of this investigation was based on the information furnished to us by Huitt-Zollars, Inc. and consisted of the following tasks.

- Called Lone Star 811 to get the utilities clearance.
- Drilled and sampled a total of two (2) soil borings each to a depth of 60 feet, on either side of proposed pedestrian bridge crossing location.
- Performed appropriate laboratory tests on selected representative soil samples to determine the engineering properties of the soils and to select design soil parameters.
- Performed engineering analyses in accordance with the Galveston County Standard Specifications to develop geotechnical recommendations for the design and construction of the proposed pedestrian bridge replacement at Magnolia Bayou crossing in Paul Hopkins Park, for the Galveston County Damage Assessments Project.
- Prepared a geotechnical investigation report.

2.0 FIELD INVESTIGATION

2.1 General

After obtaining the utilities clearance of the proposed two (2) marked borings in the field, the borings were drilled to the explored depths utilizing a truck mounted drilling rig. All the drilling and sampling were performed in accordance with appropriate ASTM procedures.

2.2 Geotechnical Borings

Subsurface conditions were explored by drilling a total of two (2) soil borings each to a depth of 60 feet. The boring locations are shown on Plan of Borings, presented on Figure 2. The survey information (northing, easting and ground surface elevation) of the completed borings were provided to us by HZ. A summary of the survey information is provided on Table 1.

Samples were taken continuously to a depth of 20 feet and at 5-foot intervals thereafter to the explored depth of borings. In general, samples of cohesive soils were obtained with a 3-inch thin-walled tube sampler in general accordance with ASTM D1587 and cohesionless soils were sampled with a 2-inch split-barrel sampler in accordance with ASTM D1586. Each sample was removed from the sampler in the field, carefully examined, and then logged by an experienced soils technician. Suitable portions of each sample were sealed and packaged for transportation to Geotest's laboratory. The shear strength of cohesive soil samples was estimated using a pocket penetrometer in the field. Driving resistances for the split-barrel sampler in cohesionless soils, recorded in the field as "blows-per-foot" are indicated on the boring logs. All the borings were grouted with cement-bentonite grout after completion of drilling and obtaining water level measurements (if any). Detailed descriptions of the soils encountered in the borings are given on the boring logs presented on Figures A-1 and A-2 in Appendix A. A key to "Symbols and Terms used on Boring Logs" is given on Figure A-3 in Appendix A.

3.0 LABORATORY TESTING

The laboratory testing program was designed to evaluate the pertinent physical properties and shear strength characteristics of the subsurface soils. Classification tests were performed on selected samples to aid in soil classification.

Undrained shear strengths of selected cohesive samples were measured by the unconsolidated undrained (UU) triaxial compression tests (ASTM D2850). The results of the UU triaxial compression tests are plotted on the boring logs as solid squares. The shear strength of cohesive samples was measured in the field with a calibrated pocket penetrometer and also in the laboratory with a Torvane. The shear strength values obtained from the penetrometer and Torvane are plotted on the boring logs as open circles and triangles, respectively.

Measurements of moisture content and dry unit weight were taken for each UU triaxial compression test sample. Moisture content (ASTM D2216) measurements were also made on other samples to define the moisture profile at each boring location. The liquid and plastic limit tests (ASTM D4318) and percent passing No. 200 sieves (ASTM D1140) were performed on appropriate samples. Sieve analyses without hydrometer (ASTM D6913) were performed on selected cohesionless soil samples.

Five (5) crumb tests (ASTM D6572), and two (2) double hydrometer tests (ASTM D4221) tests were performed to measure the potential for dispersion of soils in distilled water. Double hydrometer tests provide a qualitative evaluation of the potential for soil dispersion in the presence of distilled water. According to ASTM D4221, less than 30% dispersion indicates the soils to be nondispersive, 30 to 50% dispersion indicates the soils to be intermediate dispersive and greater than 50% dispersion indicates the soils to be dispersive.

The results of all tests are tabulated or summarized on the boring logs presented on Figures A-1 and A-2 in Appendix A. The summary of laboratory tests is also presented in a tabular form on

Figures B-1 and B-2 in Appendix B. Grain size distribution curves are presented on Figure B-3 in Appendix B. The results of the crumb test are presented on Figure B-4, and the results of the double hydrometer tests are presented on Figures B-5 and B-6 in Appendix B.

4.0 SUBSURFACE CONDITIONS

4.1 Site Geology

The project area lies in the Beaumont Formation. The clays and sands of the Beaumont Formation are over-consolidated as a result of desiccation from frequent rising and lowering of the sea level and the groundwater table. Consequently, clays of this formation have moderate to high shear strength and relatively low compressibility. The sands of the Beaumont Formation are typically very fine and often silty. Further, there is occasional evidence in the Houston-Galveston area of the occurrence of cemented material (sandstone and siltstone) deposits within the Beaumont Formation.

4.2 General Fault Information

A review of information in the Geotest library, relating to known surface and subsurface geologic faults in the general area of the project site, was undertaken. The information consists of U.S. Geological Survey maps, open file reports and information contained in our files relating to geologic faults in the project area.

Based on the available information from U.S. Geological Survey (USGS) Maps and information contained in Geotest Library relating to geologic faults, no known documented faults exist within the project area.

4.3 Soils Stratigraphy

Based on the subsurface soils encountered in the discrete boreholes drilled, one (1) boring log profile was developed and is presented on Figure 3. The symbols and abbreviations used on the boring log profile is given on Figure 4. To the left of each boring shown on the profile is an indication of the consistency or density of each stratum. More than one consistency for an individual

stratum indicates that the consistency varies within the stratum. For cohesive soils, consistency is related to the undrained shear strength of the soil and for cohesionless soils, the relative density of the soil is measured by the number of blows of the standard penetration test of the soil. To the right of each boring shown on the profile is the overall classification of the soil contained within each stratum. The classification is based on the ASTM D2487.

The subsurface soils beneath the existing grade as encountered in borings GB-1 and GB-2, and as shown in boring log profile presented in Figure 3, consist of predominantly cohesive soils to the explored depth of 60 feet. The cohesive soils consisting of medium stiff to hard dark brown, gray, yellowish brown and reddish brown fat clay, fat clay with sand, lean clay, lean clay with sand, and sandy lean clay. A stratum of medium dense yellowish brown sandy silt was encountered between the depths of 8 feet and 13 feet in boring GB-1, and a stratum of yellowish brown and gray clayey sand, and brown silty sand was encountered between depths of 8 and 12 feet in boring GB-2. Fill material consisting of stiff to very stiff dark brown fat clay with sand seams, calcareous nodules and grass roots was encountered to a depth of 2 feet in all the borings.

The fat clay and fat clay with sand are of high to very high plasticity with liquid limits ranging from 57 to 92 and plasticity indices ranging from 33 to 59. The lean clay, lean clay with sand, and sandy lean clay soils are of low to high plasticity with liquid limits ranging from 26 to 38 and plasticity indices ranging from 8 to 20. The fines content (percent passing No. 200 sieve) of fat clay, and lean clay soils ranged from 85.5 to 99.8 percent. The fines content of fat clay with sand and lean clay with sand soils ranged from 75.0 to 82.1 percent, and the fines content of sandy lean clay soils was about 61.1 percent. The fines content of sandy silt was about 69.1 percent.

4.4 Water Level

During the drilling operation, water was first encountered at a depth of 10.0 feet in borings GB-1 and GB-2. The water level measured 20 minutes after water was first encountered was at depths ranging from 3.5 feet to 4.4 feet, and the water level measured 24 hours after the completion of drilling was at depths ranging from 2.5 to 2.7 feet in these borings.

However, it should be noted that various environmental and man-made factors such as amount of precipitation, nearby subsurface construction activities, and change in bayou level can substantially influence the groundwater level.

5.0 GEOTECHNICAL RECOMMENDATIONS

5.1 General

The project consists of design and reconstruction of the existing pedestrian bridge crossing Magnolia Bayou at Paul Hopkins Park, located at 1000 FM 517 in Dickinson, Texas. Based on the information provided, it is our understanding that the existing wooden pedestrian bridge would be replaced with new bridge supports in the vicinity of the existing bridge. The proposed pedestrian bridge is approximately 130-foot long, and will be supported on 16-inch square concrete pile foundation. The channel depth at the crossing is less than 10 feet below top of the bank.

5.2 Pedestrian Bridge Crossing at Paul Hopkins Park

Based on the soils conditions revealed from borings GB-1 and GB-2, the proposed pedestrian bridge crossing Magnolia Bayou supported on 16-inch square concrete piles would be feasible. The detailed foundation recommendation for driven piles are given below.

5.2.1 Axial Pile Capacity – Method of Analysis. Axial capacities of prestressed concrete piles were computed using the static method of analysis. In the static method, the ultimate compressive capacity, Q, for a given penetration is taken as the sum of the cumulative friction capacity, Q_s, and the end bearing capacity, Q_p:

$$Q = Q_s + Q_p = fA_s + qA_p$$

Where A_s and A_p represent, respectively, the embedded pile surface area and pile tip area; f and q are the unit skin friction and unit end bearing resistance, respectively.

- Cohesive Soils. The unit skin friction, f, of a pile driven in clay at any particular depth is a function of the undrained shear strength, S_u of the clay. For highly plastic clays, "f" may be equal to "S_u" for unconsolidated and normally

consolidated clays. For over consolidated clay, "f" is taken as equal to "αS_u" where the constant "α" is dependent on the soil properties, type of piling and method of pile installation.

The unit end bearing, q, in clay is estimated using the expression:

$$q = S_u N_c$$

where,

S_u = undrained shear strength, and

N_c = a dimensionless bearing capacity factor; limited to 9.0 for deep foundations

- Cohesionless Soils. The unit skin friction, f, for piles driven in cohesionless soils is computed using the following equation:

$$f = k\,\sigma_v \tan\delta$$

where,

k = coefficient of lateral earth pressure, where k = 1.0 for compression and 0.7 for tension

σ_v = effective overburden pressure

δ = friction angle at interface of concrete surface and soil (use ϕ-5°)

ϕ = internal friction angle of soil

Unit end bearing, q, for pile driven in cohesionless soils, is computed using the following equation:

$$q = N_q\,\sigma_v$$

where,

N_q = a dimensionless bearing capacity factor which is a function of ϕ, the angle of internal friction of soil

5.2.2 Axial Capacity Curves. Based on the criteria outlined above and the soil conditions encountered in borings GB-1 and GB-2, soil parameters were developed for the computation of axial pile capacity. Summary of parameters are presented on Tables 2.1 and 2.2. Using the parameters presented on the table, the allowable axial capacities were developed for 16-inch square prestressed concrete pile and are presented graphically on Figures 5.1 and 5.2. It should be noted a factor of safety of 2.0 was incorporated in the allowable axial pile capacities. It should also be noted that in computing the axial pile capacity the contribution to axial capacity of the top 10 feet of soil has been neglected.

5.2.3 Group Effect. To reduce group effects, it is recommended that the piles be spaced with a minimum center-to-center distance (i.e., based on a single row of piles) of at least 3.0 times the pile dimension.

5.2.4 Foundation Settlement. It is believed that driven piles designed in accordance with the above recommendations, should experience small settlements. The settlements, based on load-movement curves from normalized load transfer relations for side resistance as well as base resistance in cohesive and cohesionless soils, are generally in the order of about 1 to 2% of pile dimension. Differential settlements resulting from variation in subsurface conditions and loading conditions, are also expected to be small. However, after the foundation design is completed, the aforementioned settlement can be verified/estimated (if needed) based on the final design load, final configuration and dimension of pile, final design tip elevation, and the structural properties of concrete, steel, etc. for the proposed pile foundation.

5.2.5 Lateral Capacity. If a structure is considered to be a lateral-load controlled structure, evaluation of the lateral capacity on structure foundation is warranted. The lateral load capacity will depend on the ground surface deflection, maximum bending moment, stiffness factor and soil modulus between the piles and surrounding soils. Allowable lateral load can be developed based on allowable ground surface deflection, soil modulus and stiffness of pile. However, maximum bending moment in the pile will need to be verified. Lateral load-deflection analyses utilizing a soil-structure

interaction (p-y) model, such as LPile program, can be used to provide refined estimates of deflections and bending moments along the length of the piles. The design soil parameters for LPile input data which include LPile program soil type, submerged unit weight, undrained cohesion/internal friction angle and ε_{50} were developed for the borings GB-1 and GB-2. The parameters are summarized on Table 3. The lateral load capacity analysis is beyond the scope for this project.

6.0 CONSTRUCTION CONSIDERATIONS

Driven Piles

Driven pile installation procedures should adhere to Galveston County Standard Specifications for construction of Prestressed Concrete Piling.

Piles should be driven to the design penetrations and should not be terminated at shallower depths on the basis of any dynamic formula. No jetting or pilothole should be used.

Pile driving activities generate vibrations in the ground and adjacent structures. The vibration in the ground induced by pile driving will increase the relative density of granular soils surrounding the piles. Owing to the medium dense sandy silt, silty sand and clayey sand soils revealed in borings GB-1 and GB-2, settlement due to vibration as a result of densification of the medium dense granular material may be anticipated.

We understand that there are public and private utilities, and Paul Hopkins Park structures in the vicinity of the proposed pedestrian bridge crossing. It is recommended that precautions be exercised to avoid damage to existing buildings/structures and utilities due to vibration in the ground induced by pile driving or other construction activities. This includes but not limited to:

- Performing preconstruction condition surveys to document existing conditions of adjacent structures, and utilities which may potentially be at risk before the commencement of pile driving. Generally, it is suggested that precondition surveys be performed for all buildings/structures within 250 feet radius of pile driving activity. Precondition surveys are performed by professional personnel with experience of performing precondition surveys. Monitoring should also be performed continuously throughout pile driving activities.

- Performing vibration control during pile driving to monitor vibration levels which would otherwise have damaging effects on the adjacent structures, and utilities. Vibration control should be performed by vibration specialists.

- Performing public relations by informing occupants/owners in the vicinity, of the commencement of pile driving activity and maintaining complaint logs.

7.0 PROVISIONS

The description of subsurface conditions and the design information contained in this report are based on the test borings made at the time of drilling at specific locations. Some variation in soil conditions may however, occur between test borings. Should any subsurface conditions other than those described in our boring logs be encountered, Geotest should immediately be notified so that further investigation and supplemental recommendations can be provided.

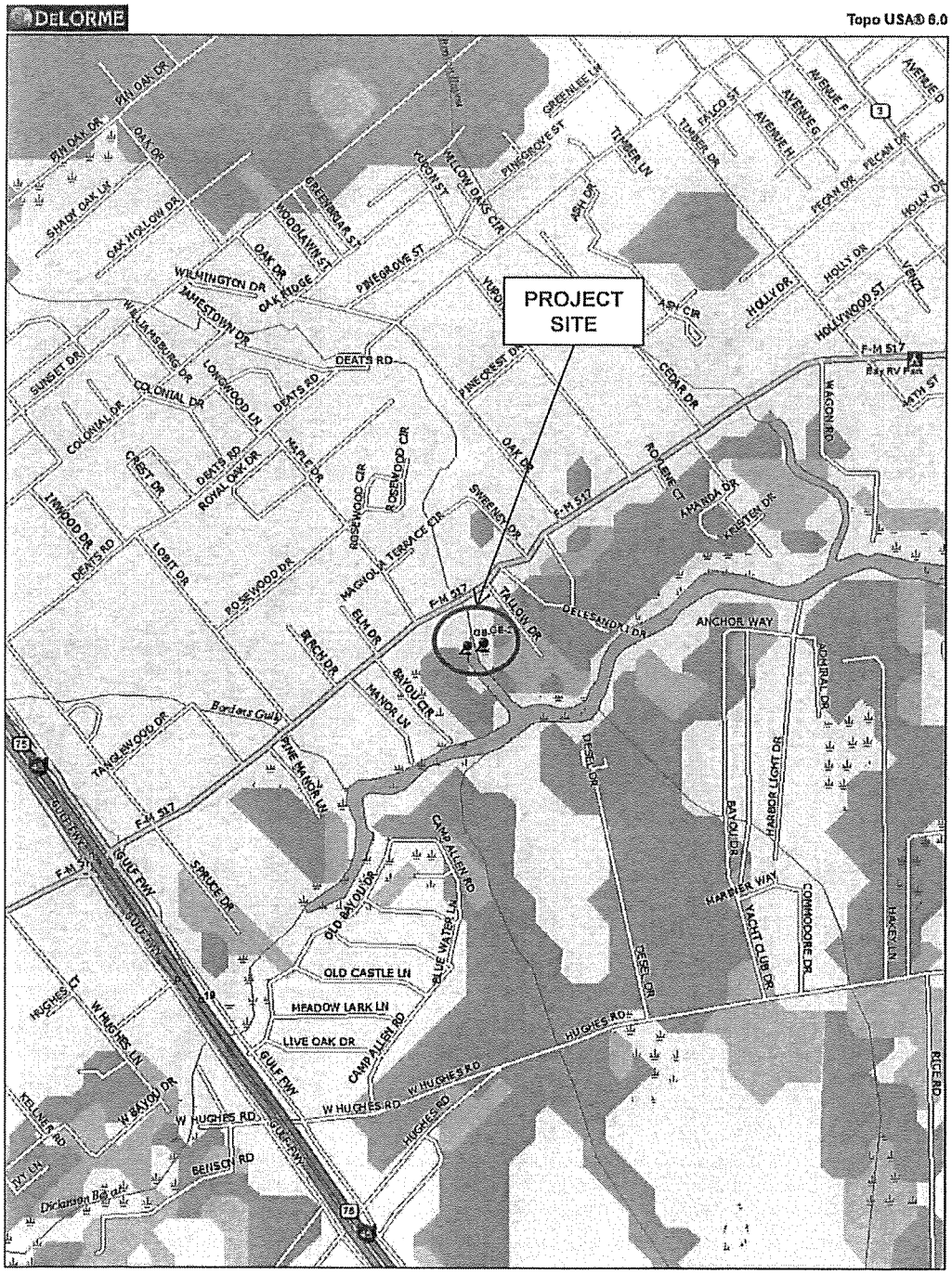
The depth of the water level may vary with changes in environmental conditions such as frequency and magnitude of rainfall. The stratification lines on the logs of borings represent the approximate boundaries between soil types. Transitions between soil types may be more gradual than depicted.

This report has been prepared for the exclusive use of Huitt-Zollars, Inc. and Galveston County for the Galveston County Damage Assessments Project in Galveston County, Texas. This report shall not be reproduced without the written permission of Geotest Engineering, Inc., Huitt-Zollars, Inc., or Galveston County.

ILLUSTRATIONS

	Figure
Vicinity Map	1
Plan of Borings	2
Boring Log Profiles	3
Symbols and Abbreviations Used on Boring Log Profile	4
Allowable Axial Capacity	
16-inch Square Concrete Piles, West Abutment	5.1
16-inch Square Concrete Piles, East Abutment	5.2

Job No. 1140243401



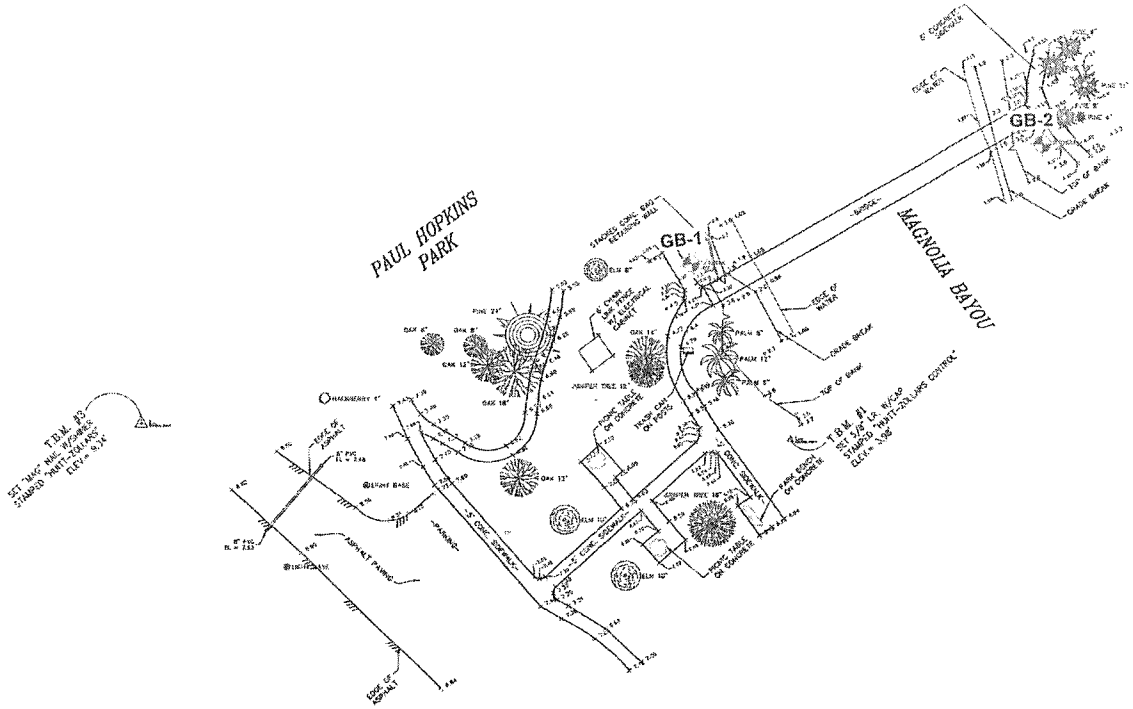
PEDESTRIAN BRIDGE REPLACEMENT AT PAUL HOPKINS PARKS
1000 FM 517
DICKINSON, TEXAS

VICINITY MAP

Geotest Engineering, Inc.

FIGURE 1

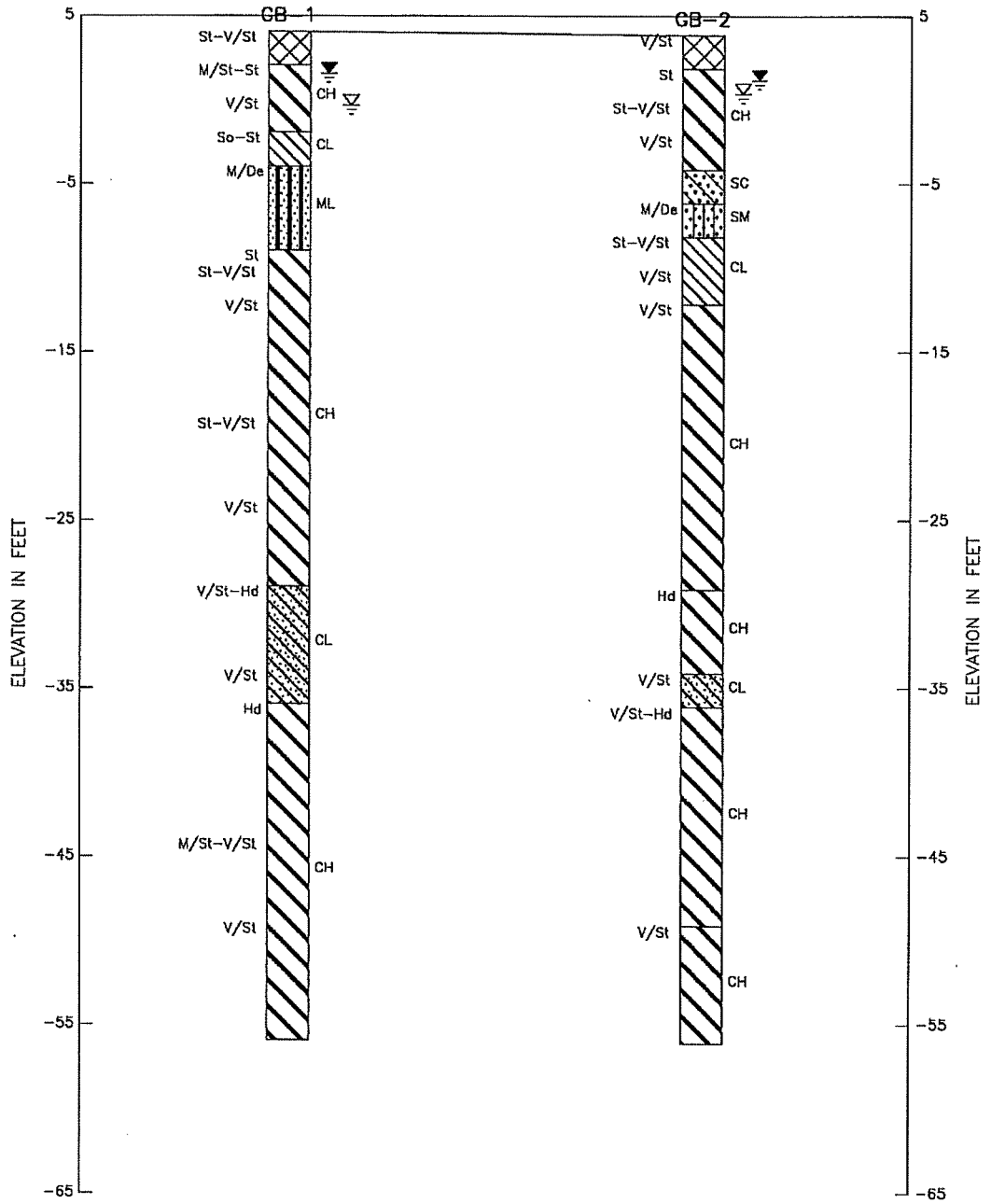
Job No. 1140243401



LEGEND	GEOTEST ENGINEERING, INC.
Boring	PEDESTRIAN BRIDGE REPLACEMENT AT PAUL HOPKINS PARK 1000 FM 517 DICKINSON, TEXAS **PLAN OF BORINGS** 0 20 40 SCALE IN FEET

Geotest Engineering, Inc.

FIGURE 2



GENERAL NOTES:

1. See Figure 2 for approximate location of borings and profile section.
2. Data concerning subsurface conditions have been obtained at boring locations only. Actual conditions between borings may differ from the profile shown here.
3. See logs of boring for detailed description of soils encountered in each borehole.
4. See Figure 4 for symbols and abbreviations used on this profile.
5. Ground surface elevation at each boring location was based on survey data provided to us by Huitt-Zollars, Inc.

BORING LOG PROFILE

Pedestrian Bridge Crossing
Borings GB-1 & GB-2

0 25 50 75 100

HORIZONTAL SCALE IN FEET

Job No. 1140243401

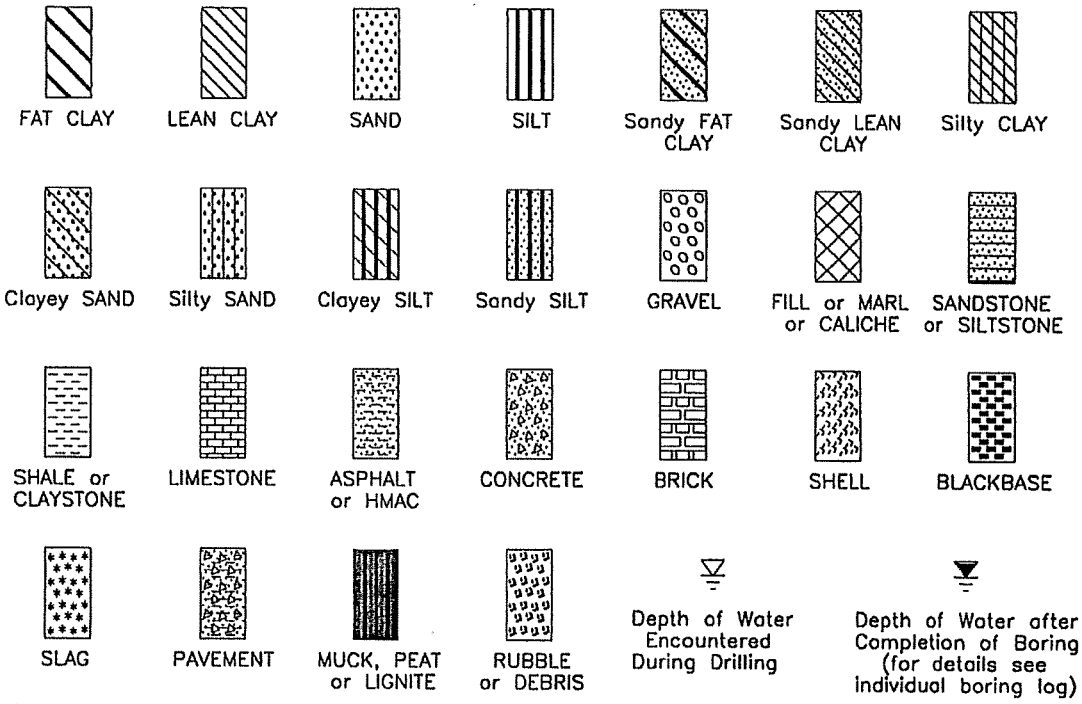
Geotest Engineering, Inc.

FIGURE 3

Job No. 1140243401

SYMBOLS AND ABBREVIATIONS USED ON BORING LOG PROFILE

LEGEND



ABBREVIATIONS USED FOR CONSISTENCY/DENSITY

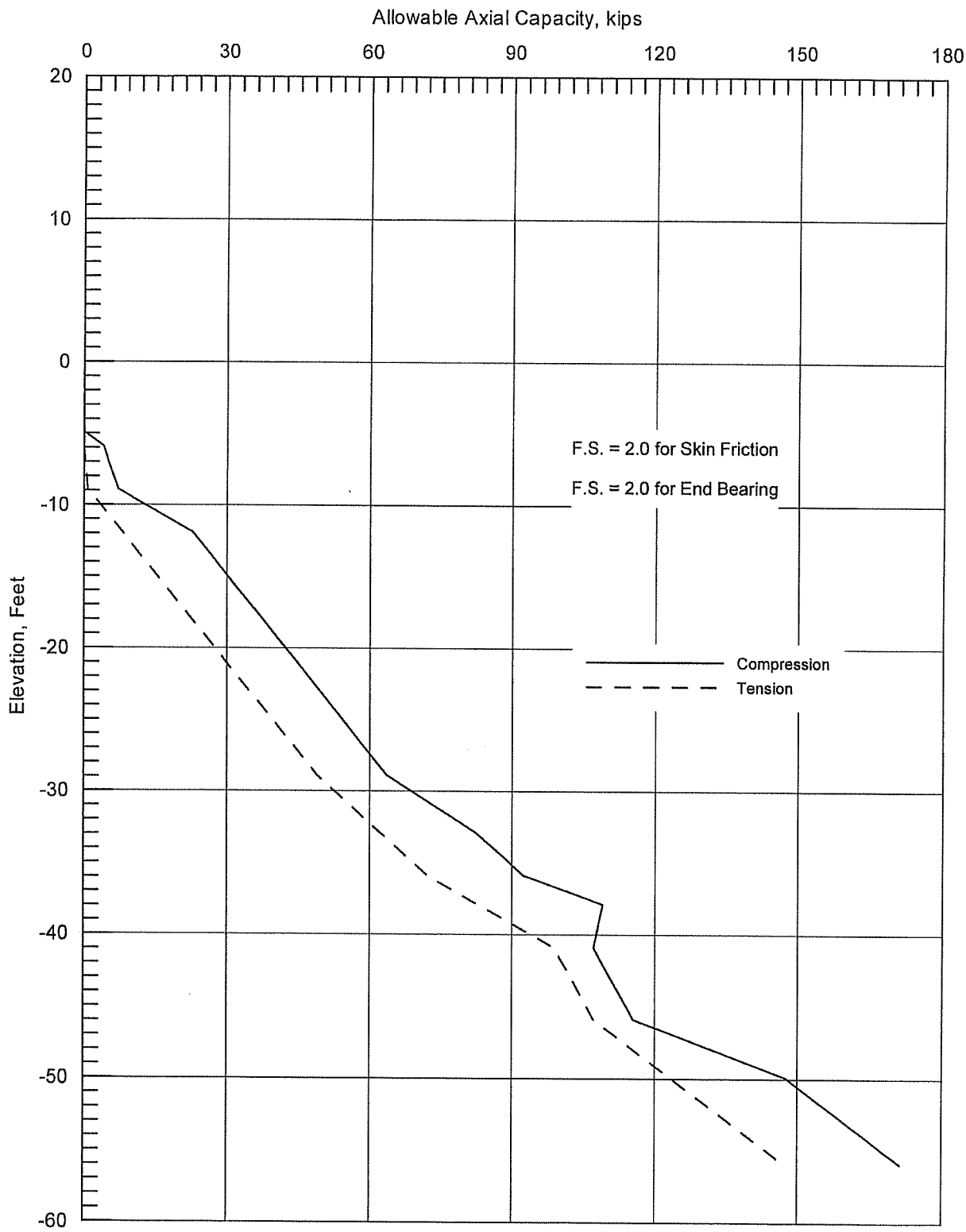
COHESIVE SOILS

V/So : Very Soft
So : Soft
Fm : Firm
M/St : Medium Stiff
St : Stiff
V/St : Very Stiff
Hd : Hard
V/Hd : Very Hard

COHESIONLESS SOILS

V/Lo : Very Loose
Lo : Loose
S/Co : Slightly Compact
Co : Compact
M/De : Medium Dense
De : Dense
V/De : Very Dense

Job No. 1140243401



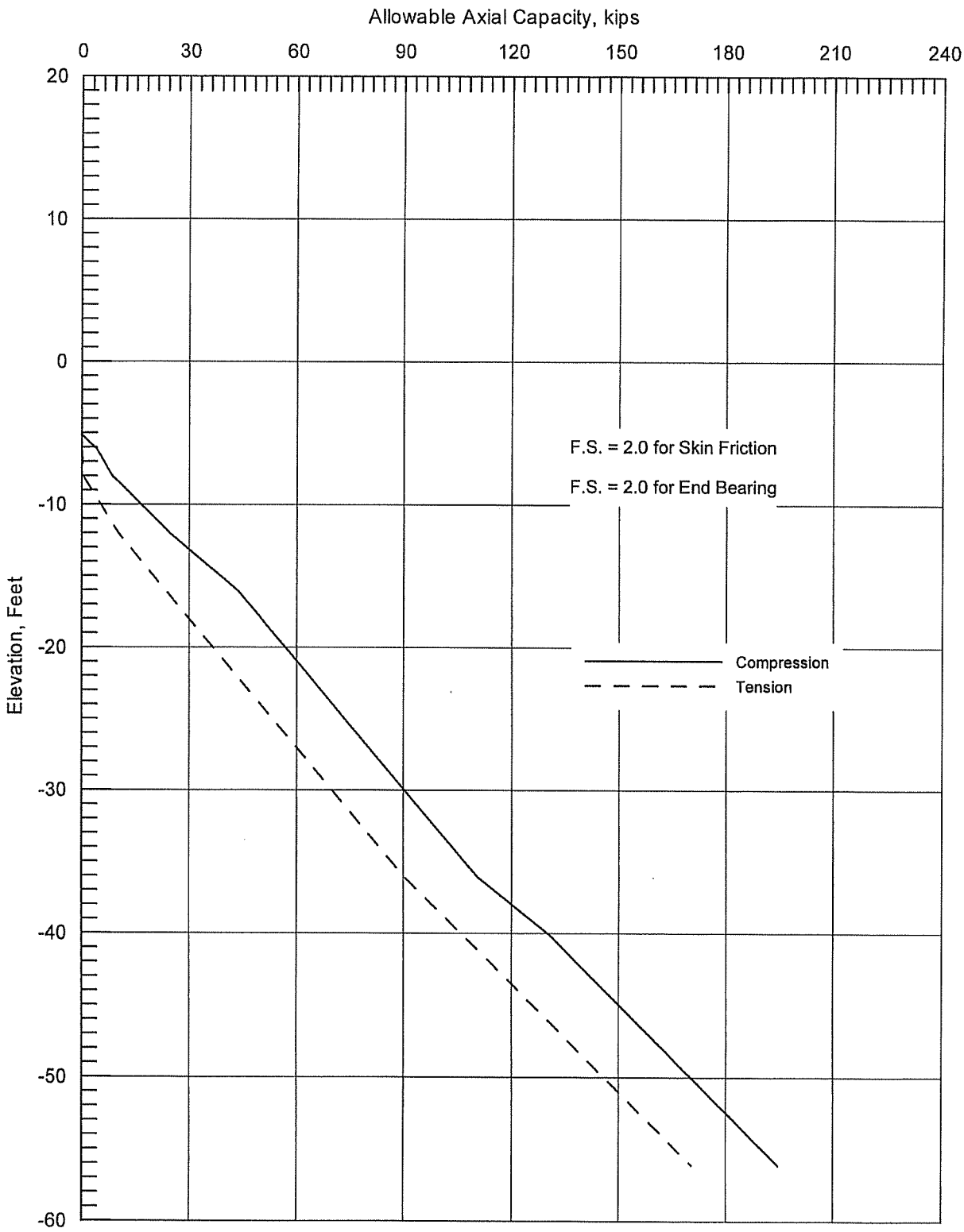
ALLOWABLE AXIAL CAPACITY

16 - INCH SQUARE CONCRETE PILES - WEST ABUTMENT
(BORING GB-1)
PEDESTRIAN BRIDGE REPLACEMENT AT
PAUL HOPKINS PARK, DICKINSON, TEXAS

COMPUTER6\C\PILE\2434\GB-1\2434-W ABUT-REV.GRF

FIGURE 5.1

Job No. 1140243401



ALLOWABLE AXIAL CAPACITY

16 - INCH SQUARE CONCRETE PILES - EAST ABUTMENT
(BORING GB-2)
PEDESTRIAN BRIDGE REPLACEMENT AT
PAUL HOPKINS PARK, DICKINSON, TEXAS

COMPUTER6\C\PILE\243401\GB-2\2434-W ABUT.GRF

FIGURE 5.2

TABLES

	Table
Summary of Boring Information	1
Summary of Soil Parameters for Driven Pile for Paul Hopkins Park Pedestrian Bridge	2.1 and 2.2
Summary of Soil Parameters for LPILE Input	3

TABLE 1

SUMMARY OF BORING INFORMATION

Boring No.	Boring Depth (feet)	Northing	Easting	Ground Surface Elevation (feet)
GB-1	60	13735356.09	3220093.29	4.07
GB-2	60	13735397.80	3220210.23	3.87

Notes: Survey information was provided by Huitt-Zollars, Inc.

TABLE 2.1

SUMMARY OF SOIL PARAMETERS FOR DRIVEN PILES FOR PEDESTRAIN BRIDGE AT PAUL HOPKINS PARK– WEST ABUTMENT (BASED ON BORING GB-1)

Depth (feet)		Elevation (feet)		Soil Type	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Undrained Cohesion (psf)	Internal Friction Angle (degree)
From	To	From	To					
0	2	4.1	2.1	Fill: fat clay w/sand	120	58	1,500	--
2	6	2.1	-1.9	Fat Clay w/sand	119	57	1,000	--
6	8	-1.9	-3.9	Lean Clay	134	67	250	--
8	13	-3.9	-8.9	Sandy Silt	104	42	--	28
13	16	-8.9	-11.9	Fat Clay	134	67	1,800	--
16	33	-11.9	-28.9	Fat Clay	122	60	1,800	--
33	40	-28.9	-35.9	Sandy Lean Clay	133	67	2,500	--
40	45	-35.9	-40.9	Fat clay	123	61	4,000	--
45	50	-40.9	-45.9	Fat Clay	129	65	1,000	--
50	60	-45.9	-55.9	Fat Clay	127	64	3,000	--

TABLE 2.2

SUMMARY OF SOIL PARAMETERS FOR DRIVEN PILES FOR PEDESTRAIN BRIDGE AT PAUL HOPKINS PARK– EAST ABUTMENT (BASED ON BORING GB-2)

Depth (feet)		Elevation (feet)		Soil Type	Total Unit Weight (pcf)	Submerged Unit Weight (pcf)	Undrained Cohesion (psf)	Internal Friction Angle (degree)
From	To	From	To					
0	2	3.9	1.9	Fill: Fat Clay	131	66	2,500	--
2	8	1.9	-4.1	Fat Clay	132	66	1,500	--
8	10	-4.1	-6.1	Clayey Sand	133	66	--	30
10	12	-6.1	-8.1	Silty Sand	117	54	--	30
12	16	-8.1	-12.1	Lean Clay w/ sand	126	63	1,800	--
16	33	-12.1	-29.1	Fat Clay	124	62	2,500	--
33	40	-29.1	-36.1	Fat Clay w/sand & Sandy Lean Clay	130	65	2,500	--
40	60	-36.1	-56.1	Fat Clay & Fat Clay w/sand	127	63	3,000	--

SUMMARY OF SOIL PARAMETERS FOR LPILE INPUT

Pedestrian Bridge Crossing at Paul Hopkins Park, Galveston County Damage Assessments Poject

Boring No.	Elevation (feet)		Depth (feet)		Lpile Program Soil Type	Submerged Unit Weight		Undrained Cohesion		Internal Friction Angle	ε_{50}*
	From	To	From	To		(pcf)	(lbs/in^3)	(psf)	(psi)	(degree)	
GB-1	4	2	0	2	Stiff Clay with Free Water	58	0.03356	1500	10.41667		
	2	-2	2	6	Stiff Clay with Free Water	57	0.03299	1000	6.94444		0.008
	-2	-4	6	8	Soft Clay	67	0.03877	250	1.73611		0.023
	-4	-9	8	13	Sand	42	0.02431			28	
	-9	-12	13	16	Stiff Clay	67	0.03877	1800	12.50000		0.022
	-12	-29	16	33	Stiff Clay	60	0.03472	1800	12.50000		0.011
	-29	-36	33	40	Stiff Clay	67	0.03877	2500	17.36111		0.017
	-36	-41	40	45	Stiff Clay	61	0.03530	4000	27.77778		
	-41	-46	45	50	Stiff Clay	65	0.03762	1000	6.94444		0.013
	-46	-56	50	60	Stiff Clay	64	0.03704	3000	20.83333		
GB-2	4	2	0	2	Stiff Clay with Free Water	66	0.03819	2500	17.36111		
	2	-4	2	8	Stiff Clay with Free Water	66	0.03819	1500	10.41667		0.019
	-4	-6	8	10	Sand	66	0.03819			30	
	-6	-8	10	12	Sand	54	0.03125			30	
	-8	-12	12	16	Stiff Clay	63	0.03646	1800	12.50000		
	-12	-29	16	33	Stiff Clay	62	0.03588	2500	17.36111		0.013
	-29	-36	33	40	Stiff Clay	65	0.03762	2500	17.36111		
	-36	-56	40	60	Stiff Clay	63	0.03646	3000	20.83333		0.012

* ε_{50} values were computed from the laboratory stress strain curves

Notes: 1. Use groundwater level at ground surface (flood condition)
2. Use Internal defult p-y subgrade modulus k computed by Lpile (input k as 0)

APPENDIX A

	Figure
Log of Borings	A-1 and A-2
Symbols and Terms Used on Boring Logs	A-3

LOG OF BORING NO. GB-1

PROJECT : Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas

PROJECT NO. : 1140243401

LOCATION : N 13735356.09, E 3220093.29
See Plan of Borings (Figure 2)

COMPLETION DEPTH : 60.0 FT.

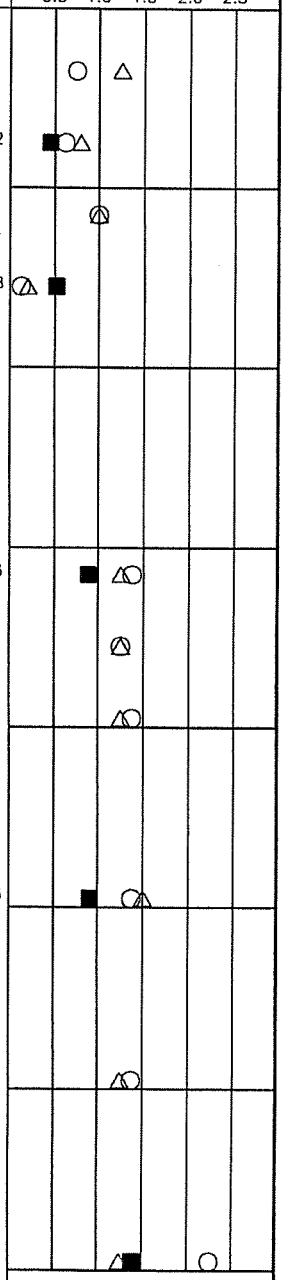
SURFACE ELEVATION : 4.07 FT.

DATE : 04-15-19

SAMPLER : Shelby Tube/Split Spoon
DRY AUGER : 0.0 TO 10.0 FT.
WET ROTARY : 10.0 TO 60.0 FT.

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE

ELEVATION, FEET	DEPTH, FEET	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
4.1	0	FILL: stiff to very stiff dark brown fat clay w/sand and grass roots				25.0			
2.1		Medium stiff to stiff yellowish brown and gray FAT CLAY WITH SAND (CH) w/calcareous and ferrous nodules and ferrous stains		75.0	94	26.3	68	26	42
	5								
-1.9		-very stiff 4'-6'				22.1			
-3.9		Soft to stiff yellowish brown LEAN CLAY (CL) w/silt seams		93.8	111	20.8	26	18	8
	10	Medium dense yellowish brown SANDY SILT (ML)	10	69.1		20.0			
			11			22.0			
-8.9		Stiff brown FAT CLAY (CH)	8			25.3			
	15	-stiff to very stiff 14'-16' -w/calcareous nodules 14'-18' -very stiff 16'-20'		97.2	108	24.5	57	24	33
						29.5			
	20					31.5			
		-stiff to very stiff 23'-25'							
	25			99.8	93	31.4	82	29	53
		-very stiff 28'-30'							
	30					31.4			
-28.9		Very stiff to hard gray and yellowish brown SANDY LEAN CLAY (CL)							
-30.9	35			61.1	113	18.1	33	17	16



DEPTH TO WATER IN BORING :
▽: FREE WATER 1st ENCOUNTERED AT 10.0 FT. DURING DRILLING; AFTER 20.0 MIN. AT 4.4 FT.
▼: WATER DEPTH AT 2.5 FT., HOLE OPEN TO 7.0 FT. ON 04-16-19.

Continued on Figure A-1a

Geotest Engineering, Inc.

FIGURE A-1

LOG OF BORING NO. GB-1 Cont'd

PROJECT : Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas

PROJECT NO. : 1140243401

LOCATION : N 13735356.09, E 3220093.29
See Plan of Borings (Figure 2)

COMPLETION DEPTH : 60.0 FT.

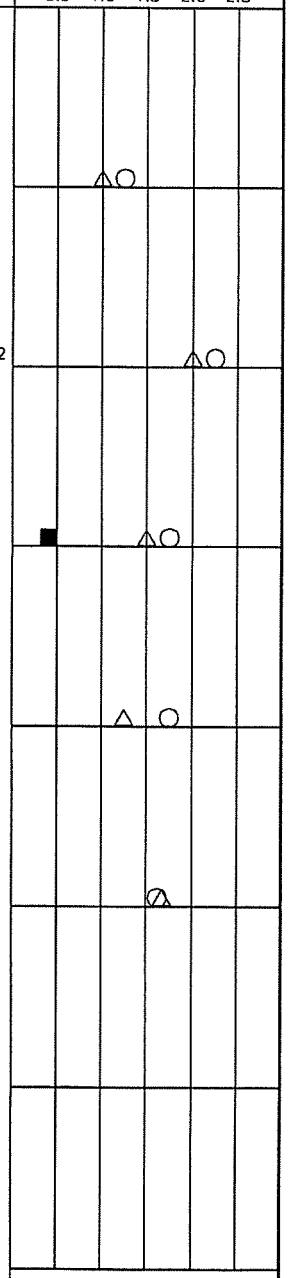
SURFACE ELEVATION : 4.07 FT.

DATE : 04-15-19

SAMPLER : Shelby Tube/Split Spoon
DRY AUGER : 0.0 TO 10.0 FT.
WET ROTARY : 10.0 TO 60.0 FT.

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE

ELEVATION, FEET	DEPTH, FEET	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
-30.9	35			Very stiff to hard gray and yellowish brown SANDY LEAN CLAY (CL)							
				-very stiff w/calcareous nodules 38'-40'							
-35.9	40			Hard reddish brown and gray FAT CLAY (CH) w/calcareous nodules				17.7			
	45					99.0		23.0	66	24	42
				-medium stiff to very stiff 48'-50'							
	50						100	29.0			
				-very stiff 53'-60'							
	55							23.1			
-55.9	60							31.3			
	65										
	70										



DEPTH TO WATER IN BORING :
▽: FREE WATER 1st ENCOUNTERED AT 10.0 FT. DURING DRILLING; AFTER 20.0 MIN. AT 4.4 FT.
▼: WATER DEPTH AT 2.5 FT., HOLE OPEN TO 7.0 FT. ON 04-16-19.

Geotest Engineering, Inc.

FIGURE A-1a

LOG OF BORING NO. GB-2

PROJECT : Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas

PROJECT NO. : 1140243401

LOCATION : N 13735397.80, E 3220210.23
See Plan of Borings (Figure 2)

COMPLETION DEPTH : 60.0 FT.

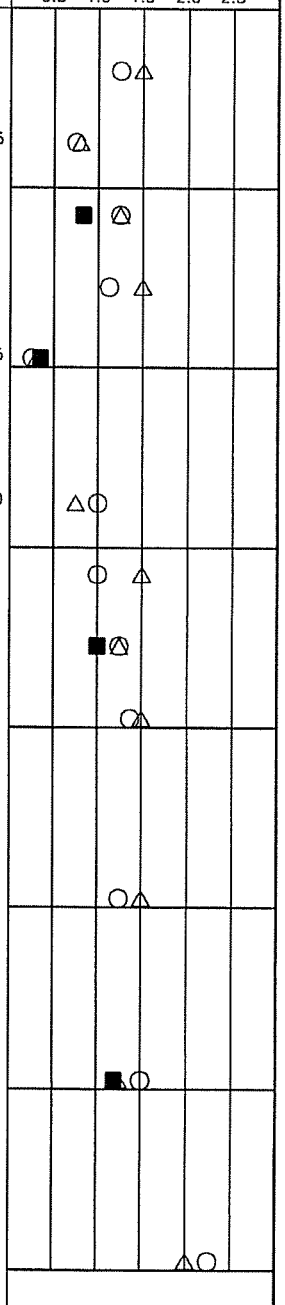
SURFACE ELEVATION : 3.87 FT.

DATE : 04-15-19

SAMPLER : Shelby Tube/Split Spoon
DRY AUGER : 0.0 TO 10.0 FT.
WET ROTARY : 10.0 TO 60.0 FT.

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE

ELEVATION, FEET	DEPTH, FEET	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
3.9	0	FILL: very stiff dark gray fat clay w/grass roots and calcareous nodules				20.2			
1.9		Stiff yellowish brown and gray FAT CLAY (CH) w/calcareous and ferrous nodules		85.5		23.7	58	23	35
	5	-stiff to very stiff gray and brown 4'-6'			109	21.2			
		-very stiff 6'-8'				24.1			
-4.1		Yellowish brown and gray CLAYEY SAND (SC)		34.5	109	22.3	33	18	15
-6.1	10	Medium dense brown SILTY SAND (SM)	15	40.9		23.6			
-8.1		Stiff to very stiff brown and gray LEAN CLAY WITH SAND (CL)		82.1		20.6	38	18	20
	15	-very stiff w/calcareous nodules 14'-16'				20.8			
-12.1		Very stiff brown FAT CLAY (CH)			94	31.4			
	20					31.2			
	25					30.1			
		-w/calcareous and ferrous nodules 28'-33'							
	30			95.4	95	30.5	92	33	59
-29.1		Hard gray and brown FAT CLAY WITH SAND (CH) w/calcareous and ferrous nodules							
-31.1	35			75.8		18.8	64	23	41



DEPTH TO WATER IN BORING :
: FREE WATER 1st ENCOUNTERED AT 10.0 FT. DURING DRILLING; AFTER 20.0 MIN. AT 3.5 FT.
: WATER DEPTH AT 2.7 FT., HOLE OPEN TO 12.0 FT. ON 04-16-19.

Continued on Figure A-2a

Geotest Engineering, Inc.

LOG OF BORING NO. GB-2 Cont'd

PROJECT : Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas

PROJECT NO. : 1140243401

LOCATION : N 13735397.80, E 3220210.23
See Plan of Borings (Figure 2)

COMPLETION DEPTH : 60.0 FT.

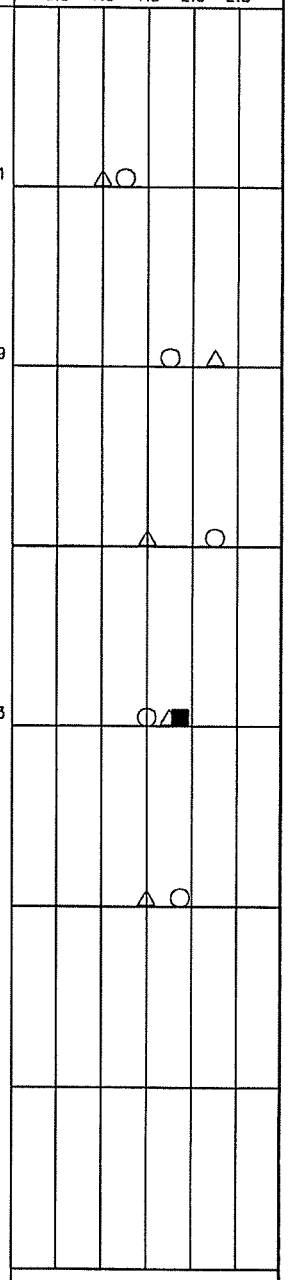
SURFACE ELEVATION : 3.87 FT.

DATE : 04-15-19

SAMPLER : Shelby Tube/Split Spoon
DRY AUGER : 0.0 TO 10.0 FT.
WET ROTARY : 10.0 TO 60.0 FT.

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE

ELEVATION, FEET	DEPTH, FEET	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	NATURAL MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
-31.1	35	Hard gray and brown FAT CLAY WITH SAND (CH) w/calcareous and ferrous nodules							
-34.1		Very stiff yellowish brown SANDY LEAN CLAY (CL) w/calcareous nodules							
-36.1	40	Very stiff to hard gray and brown FAT CLAY (CH) w/ferrous nodules and ferrous stains		66.8		19.9	40	19	21
	45			99.3		24.9	75	26	49
	50					30.4			
-49.1		Very stiff gray FAT CLAY WITH SAND (CH) w/ferrous nodules and ferrous stains							
	55			76.8	103	23.1	69	26	43
-56.1	60					21.3			
	65								
	70								

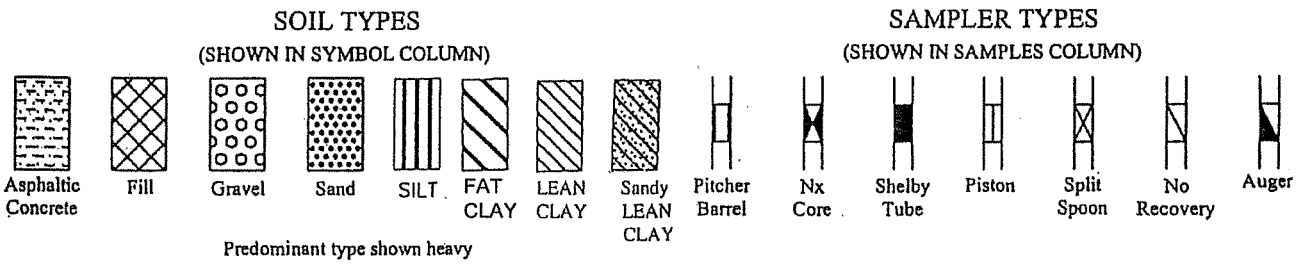


DEPTH TO WATER IN BORING :
▽: FREE WATER 1st ENCOUNTERED AT 10.0 FT. DURING DRILLING; AFTER 20.0 MIN. AT 3.5 FT.
▼: WATER DEPTH AT 2.7 FT., HOLE OPEN TO 12.0 FT. ON 04-16-19.

Geotest Engineering, Inc.

FIGURE A-2a

SYMBOLS AND TERMS USED ON BORING LOGS



TERMS DESCRIBING CONSISTENCY OR CONDITION

Basic Soil Type	Density or Consistency	Standard Penetration Resistance, (1) Blows/ft.	Unconfined Compressive Strength (q_u), (2) Tons/sq. ft.
Cohesionless	Very loose	Less than 4	Not applicable
	Loose	4 to <10	Not applicable
	Medium dense	10 to <30	Not applicable
	Dense	30 to <50	Not applicable
	Very dense	50 or greater	Not applicable
Cohesive	Very soft	Less than 2	Less than 0.25
	Soft	2 to <4	0.25 to <0.5
	Firm/Medium stiff	4 to <8	0.5 to <1.0
	Stiff	8 to <15	1.0 to <2.0
	Very stiff	15 to <30	2.0 to <4.0
	Hard	30 or greater	4 or greater

(1) Number of blows from 140-lb. weight falling 30-in. to drive 2-in. OD, 1-3/8-in. ID, split barrel sampler (ASTM D1586)

(2) q_u may also be approximated using a pocket penetrometer

TERMS CHARACTERIZING SOIL STRUCTURE

Parting: -paper thin in size Seam: -1/8" to 3" thick Layer: -greater than 3"

Slickensided	- having inclined planes of weakness that are slick and glossy in appearance.
Fissured	- containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
Laminated	- composed of thin layers of varying color and texture.
Interbedded	- composed of alternate layers of different soil types.
Calcareous	- containing appreciable quantities of calcium carbonate.
Well graded	- having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
Poorly graded	- predominantly of one grain size, or having a range of sizes with some intermediate size missing.
Flocculated	- pertaining to cohesive soils that exhibit a loose knit or flakey structure.

APPENDIX B

	Figure
Summary of Laboratory Test Results	B-1 and B-2
Grain Size Distribution Curves	B-3
Crumb Test Results	B-4
Double Hydrometer	B-5 and B-6

SUMMARY OF LABORATORY TEST RESULTS

GEOTEST ENGINEERING, INC.

PROJECT NAME: Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas
PROJECT NUMBER: 1140243401

BORING NO.	SAMPLE No.	Depth (ft.) Top	Depth (ft.) Bottom	Type	SPT (blows/ft.)	WATER CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	PASSING NO. 200 SIEVE (%)	UNCONFINED COMPRESSION TEST Shear Strength (tsf)	TRIAXIAL COMPRESSION TEST (U-U) Shear Strength (tsf)	TRIAXIAL COMPRESSION TEST (U-U) Conf. Press. (tsf)	TORVANE Shear Strength (tsf)	POCKET PENE-TROMETER Shear Strength (tsf)	TYPE OF MATERIAL
GB-1	1	0.0	2.0	UD		25.0									1.25	0.75	Fill
	2	2.0	4.0	UD		26.3	94	68	26	42	75.0		0.45	0.29	0.80	0.63	Fat Clay w/Sand
	3	4.0	6.0	UD		22.1									1.00	1.00	Fat Clay w/Sand
	4	6.0	8.0	UD		20.8	111	26	18	8	93.8		0.52	0.58	0.20	0.13	Lean Clay
	5	8.5	10.0	SS	10	20.0					69.1						Sandy Silt
	6	10.5	12.0	SS	11	22.0											Sandy Silt
	7	12.5	14.0	SS	8	25.3											Fat Clay
	8	14.0	16.0	UD		24.5	108	57	24	33	97.2		0.89	1.15	1.25	1.38	Fat Clay
	9	16.0	18.0	UD		29.5									1.25	1.25	Fat Clay
	10	18.0	20.0	UD		31.5									1.25	1.38	Fat Clay
	11	23.0	25.0	UD		31.4	93	82	29	53	99.8		0.91	1.80	1.50	1.38	Fat Clay
	12	28.0	30.0	UD		31.4									1.25	1.38	Fat Clay
	13	33.0	35.0	UD		18.1	113	33	17	16	61.1		1.39	2.52	1.25	2.25	Sandy Lean Clay
	14	38.0	40.0	UD		17.7									1.00	1.25	Sandy Lean Clay
	15	43.0	45.0	UD		23.0		66	24	42	99.0				2.00	2.25	Fat Clay
	16	48.0	50.0	UD		29.0	100						0.41	3.60	1.50	1.75	Fat Clay
	17	53.0	55.0	UD		23.1									1.25	1.75	Fat Clay
	18	58.0	60.0	UD		31.3									1.67	1.63	Fat Clay

LEGEND:
UD = UNDISTURBED SAMPLE, EXTRUDED IN FIELD
SS = SPLIT SPOON SAMPLE
AG = AUGER CUTTINGS
PB = PITCHER BARREL SAMPLE
Nx = Nx-DOUBBLE BARREL SAMPLE

SPT = Standard Penetration Test
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index

FIGURE B-1

SUMMARY OF LABORATORY TEST RESULTS

GEOTEST ENGINEERING, INC.

PROJECT NAME: Pedestrian Bridge Replacement at Paul Hopkins Park
1000 FM 517
Dickinson, Texas
PROJECT NUMBER: 1140243401

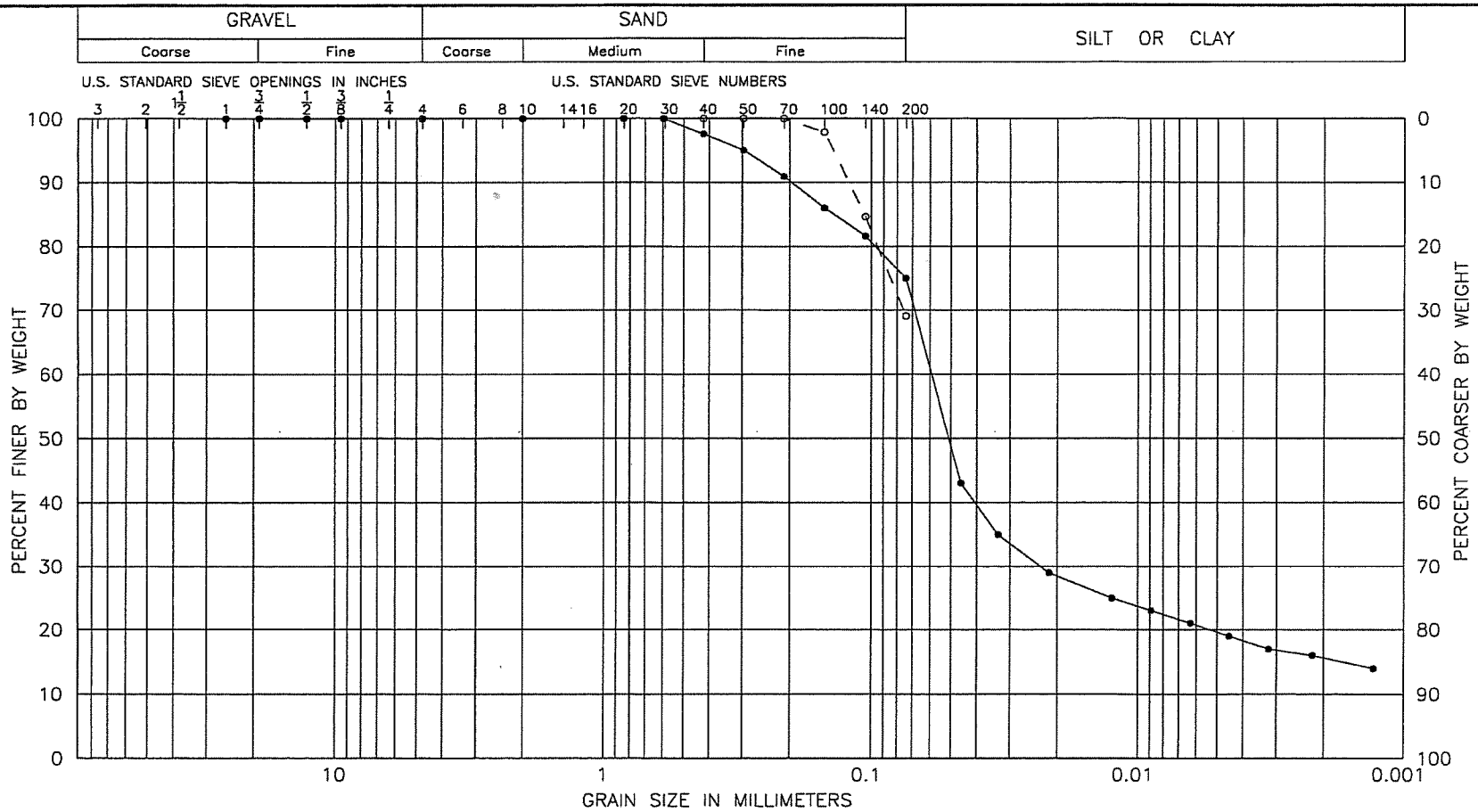
BORING NO.	SAMPLE No.	SAMPLE Depth (ft.) Top	SAMPLE Depth (ft.) Bottom	SAMPLE Type	SPT (blows/ft.)	WATER CONTENT (%)	DRY DENSITY (pcf)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PL	ATTERBERG LIMITS PI	PASSING NO. 200 SIEVE (%)	UNCONFINED COMPRESSION TEST Shear Strength (tsf)	TRIAXIAL COMPRESSION TEST (U-U) Shear Strength (tsf)	TRIAXIAL COMPRESSION TEST (U-U) Conf. Press. (tsf)	TORVANE Shear Strength (tsf)	POCKET PENE-TROMETER Shear Strength (tsf)	TYPE OF MATERIAL
GB-2	1	0.0	2.0	UD		20.2									1.50	1.25	Fill
	2	2.0	4.0	UD		23.7		58	23	35	85.5				0.80	0.75	Fat Clay
	3	4.0	6.0	UD		21.2	109						0.83	0.43	1.25	1.25	Fat Clay
	4	6.0	8.0	UD		24.1									1.50	1.13	Fat Clay
	5	8.0	10.0	UD		22.3	109	33	18	15			0.35	0.72	0.30	0.25	Lean Clay
	6	10.5	12.0	SS	15	23.6											Sandy Silt
	7	12.0	14.0	UD		20.6		38	18	20	82.1				0.75	1.00	Lean Clay w/Sand
	8	14.0	16.0	UD		20.8									1.50	1.00	Lean Clay w/Sand
	9	16.0	18.0	UD		31.4	94						1.00	1.30	1.25	1.25	Fat Clay
	10	18.0	20.0	UD		31.2									1.50	1.38	Fat Clay
	11	23.0	25.0	UD		30.1									1.50	1.25	Fat Clay
	12	28.0	30.0	UD		30.5	95	92	33	59	95.4		1.20	2.16	1.25	1.50	Fat Clay
	13	33.0	35.0	UD		18.8									2.00	2.25	Lean Clay
	14	38.0	40.0	UD		19.9									1.00	1.25	Lean Clay
	15	43.0	45.0	UD		24.9									2.25	1.75	Fat Clay w/Sand
	16	48.0	50.0	UD		30.4									1.50	2.25	Fat Clay w/Sand
	17	53.0	55.0	UD		23.1	103	69	26	43	76.8		1.87	3.96	1.75	1.50	Fat Clay w/Sand
	18	58.0	60.0	UD		21.3									1.50	1.88	Fat Clay w/Sand

LEGEND:
UD = UNDISTURBED SAMPLE, EXTRUDED IN FIELD
SS = SPLIT SPOON SAMPLE
AG = AUGER CUTTINGS
PB = PITCHER BARREL SAMPLE
Nx = Nx-DOUBBLE BARREL SAMPLE

SPT = Standard Penetration Test
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index

FIGURE B-2

Job No. 1140243401



LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION
●—●—●—●	GB-1	S-2	2.0-4.0	Yellowish brown and gray fat clay with sand
○—○—○—○	GB-1	S-5	8.5-10.0	Yellowish brown sandy silt

GRAIN SIZE DISTRIBUTION CURVES

Geotest Engineering, Inc.

FIGURE B-3

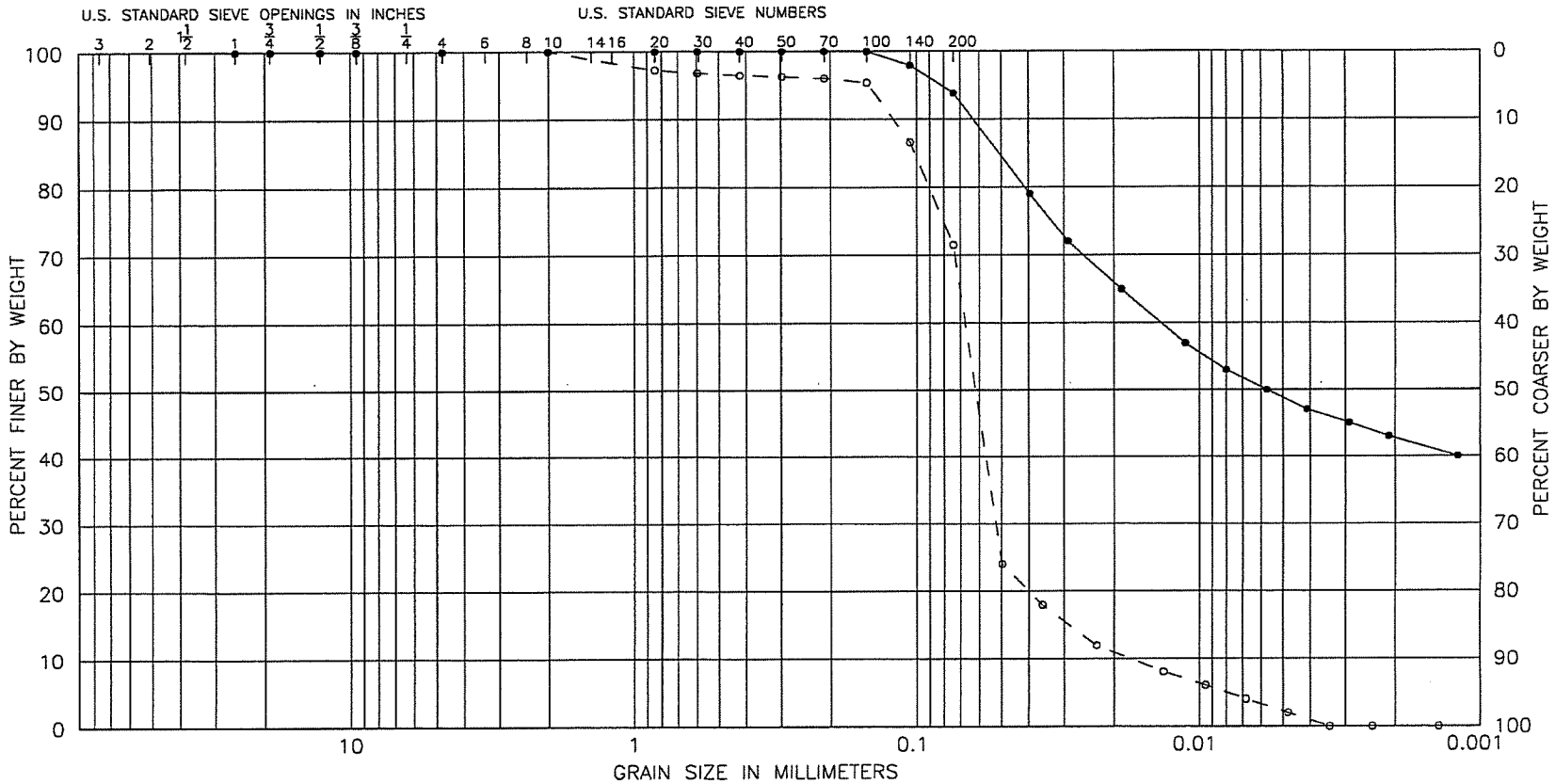
** TEST REPORT, CRUMB TESTS (ASTM D6572)

Boring No.	GB-1	GB-1	GB-2	GB-2	GB-2
Sample No.	2	8	3	5	7
Depth (ft)	2-4	14-16	4-6	8-10	12-14
Visual Classification	Yellowish brown and gray	Brown	Yellowish brown and gray	Yellowish brown and gray	Gray and brown
	Fat Clay w/sand (CH)	Fat Clay (CH)	Fat Clay (CH)	Clayey Sand (SC)	Lean clay w/sand (CL)
Test Method	Method A	Method A	Method A	Method A	Method A
Water Content (%)	26.3	24.5	21.2	22.3	20.8
Unit Dry Weight (pcf)	94	108	NA	NA	NA
Turbidity	Clear	Clear	Clear	Clear	Clear
Classification	ND	ND	ND	ND	ND

Note:
ND=Nondispersive

CRUMB TEST
Galveston County Damage Assessments Project
Galveston County, Texas

Job No. 1140243401



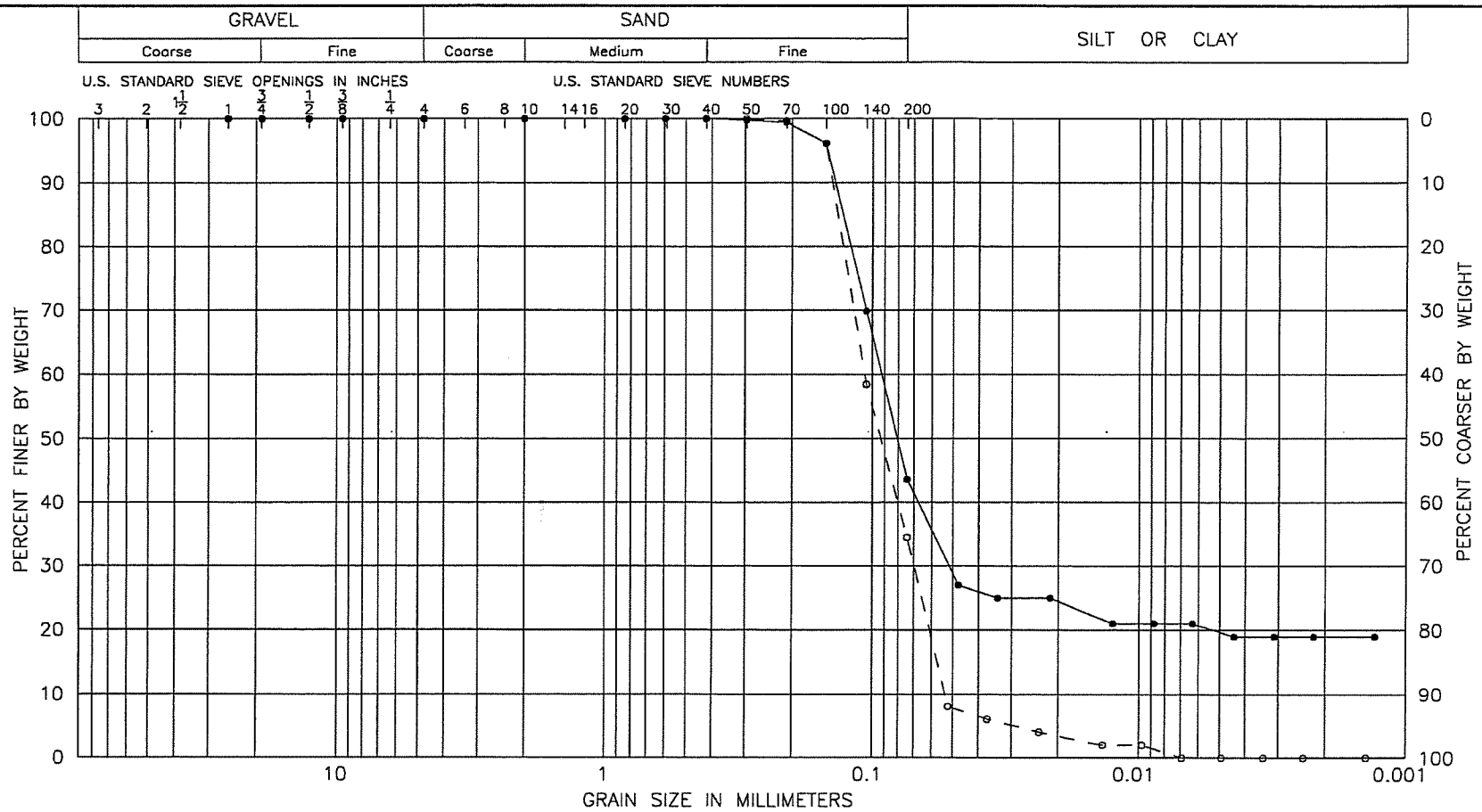
LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	
●●●●●	GB-1	S-4	6.0-8.0	Yellowish brown lean clay w/silt seams (ASTM D4221, 10.1)	% DISPERSION = 0
○○○○○	GB-1	S-4	6.0-8.0	Yellowish brown lean clay w/silt seams (ASTM D4221, 10.2)	

DOUBLE HYDROMETER

Geotest Engineering, Inc.

FIGURE B-5

Job No. 1140243401



LEGEND	BORING NO.	SAMPLE NO.	DEPTH FT.	SAMPLE DESCRIPTION	
●●●●●	GB-2	S-5	8.0-10.0	Yellowish brown and gray lean clay (ASTM D4221, 10.1)	% DISPERSION = 0
○○○○○	GB-2	S-5	8.0-10.0	Yellowish brown and gray lean clay (ASTM D4221, 10.2)	

DOUBLE HYDROMETER

Geotest Engineering, Inc.

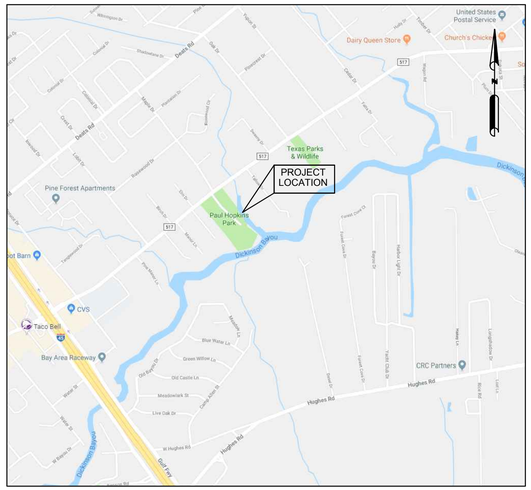
FIGURE B-6

GALVESTON COUNTY

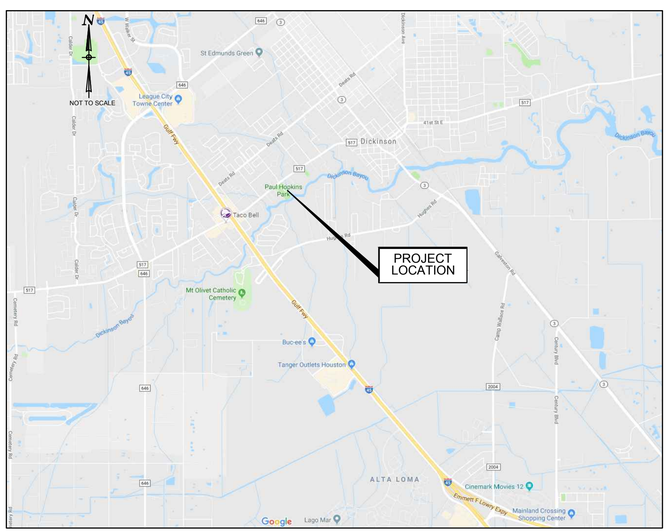
PAUL HOPKINS PARK PEDESTRIAN BRIDGE

1000 FM 517, DICKINSON, TEXAS 77539

TDLR #TABS2019014408



LOCATION MAP



VICINITY MAP

C1 – COVER SHEET
C2 – CIVIL GENERAL NOTES
C3 – TOPOGRAPHIC SURVEY
C4 – DEMOLITION PLAN
C5 – OVERALL SITE PLAN
C6 – FOUNDATION PLAN
C7 – ENGLARGED SITE PLAN
C8 – SWPPP & DETAILS

A1 – PROPOSED BRIDGE ELEVATION

S1 – STRUCTURAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS
S2 – RAMP DETAILS
S3 – RAMP DETAILS
S4 – BRIDGE DETAILS
S5 – STRUCTURAL DETAILS
S6 – CANOPY ALT #1
S7 – PRESTRESSED CONCRETE PILING

6/18/2019
HZI JOB NO. R308586.01

ISSUED FOR CONSTRUCTION

GALVESTON COUNTY
COMMISSIONERS COURT

COUNTY JUDGE	MARK A. HENRY
COMMISSIONER, PRECINCT NO. 1	DARRELL APFFEL
COMMISSIONER, PRECINCT NO. 2	JOE GIUSTI
COMMISSIONER, PRECINCT NO. 3	STEPHEN D. HOLMES
COMMISSIONER, PRECINCT NO. 4	KEN CLARK

NOTE: A PRE-CONSTRUCTION MEETING WITH GALVESTON COUNTY ENGINEERING DEPARTMENT IS REQUIRED AT LEAST 10 WORKING DAYS PRIOR TO ON SITE CONSTRUCTION ACTIVITIES. CALL (409) 770-5399 FOR A MEETING DATE AND TIME.

HUITT-ZOLLARS
10350 RICHMOND AVENUE, SUITE 300
HOUSTON, TEXAS 77042-4248
(281) 496-0066
TBPE FIRM# F-761

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/18/2019
Huitt-Zollars Inc.
Firm Registration No. F-761
MCGilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019
2	FOR CONSTRUCTION	6/25/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

COVER SHEET

Project number	R308586.01
Date	6/25/2019
Drawn by	CG
Checked by	GW

C1

Scale

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GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS BEFORE BEGINNING CONSTRUCTION.

2. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SECURITY TO PROTECT THE PROJECT SITE, CONTRACTOR PROPERTY, EQUIPMENT, AND WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING STREETS OF CONSTRUCTION DIRT AND DEBRIS AT CLOSE OF EACH WORK DAY.

4. THE CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF THE JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.

5. PRIOR TO CONSTRUCTION, THE CONTRACTOR, ALONG WITH CONCURRENCE FROM THE FIELD ENGINEER, SHALL DETERMINE HIS/HER LAY-DOWN AND/OR STAGING AREA LOCATIONS.

6. THE CONTRACTOR SHALL NOTIFY ALL PROPERTY OWNERS A MINIMUM OF 24 HOURS PRIOR TO BLOCKING DRIVEWAYS OR ENTERING UTILITY EASEMENTS.

7. TRAFFIC INGRESS AND EGRESS FOR DRIVEWAYS AND PEDESTRIAN ACCESS FACILITIES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

8. THE CONTRACTOR SHALL REMOVE ANY FENCES, POSTS, MAILBOXES, PLANTERS, PERMANENT TRASH CONTAINERS, CULVERTS, ETC. OR SECTIONS THEREOF, THAT ENCROACH WITHIN THE COUNTY'S RIGHT-OF-WAY. NOTE: PRIOR TO CONSTRUCTION, THE PROPERTY OWNER WAS PAID TO RELOCATE OR REPLACE THESE ITEMS OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY. IF THE OWNER HAS FAILED TO DO SO, THE CONTRACTOR WILL REPLACE THEM WITH THE MINIMUM LEVEL OF QUALITY NEEDED TO SECURE THE PROPERTY AND/OR MAINTAIN MAIL DELIVERY. IN THAT CASE, PAYMENT FOR THESE INSTALLATIONS WILL BE INCLUDED AS EXTRA WORK ITEMS OR AS OVERRUNS TO EXISTING PAY ITEMS.

   ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS LOCATED OUTSIDE OF THE COUNTY'S RIGHT-OF-WAY, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   ALSO, IF THESE ITEMS ARE LOCATED WITHIN THE PROJECT RIGHT-OF-WAY AND ARE DESIGNATED TO REMAIN, ANY DAMAGE CAUSED BY THE CONTRACTOR TO SUCH ITEMS, SHALL BE REPLACED WITH LIKE-KIND OR BETTER AT THE CONTRACTOR'S EXPENSE.

   TREES, BUSHES, SHRUBBERY AND OTHER DAMAGED PLANTINGS DESIGNATED TO REMAIN SHALL BE REPLACED WITHIN 72 HOURS OF REMOVAL AND ARE TO BE THOROUGHLY WATERED-IN. NO SEPARATE PAY.

9. PAVED SURFACES, PAVEMENT MARKERS AND MARKINGS SHALL BE PROTECTED FROM DAMAGE BY TRACKED EQUIPMENT.

10. IRON RODS DISTURBED DURING CONSTRUCTION ARE TO BE REPLACED BY A REGISTERED PUBLIC LAND SURVEYOR FOR THE ORIGINAL PROPERTY OWNER AT NO SEPARATE PAY.

11. CONSTRUCTION STAKING WILL BE PROVIDED BY THE CONTRACTOR. TWO COPIES OF STAKING NOTES TO BE PROVIDED TO THE ENGINEER PRIOR TO CONSTRUCTION.

12. THE CONTRACTOR SHALL MAINTAIN UPDATED RED-LINED RECORD DRAWINGS ON SITE FOR INSPECTION BY THE ENGINEER.

13. THE REMOVAL OF ANY ABANDONED UTILITIES REQUIRED TO COMPLETE THE WORK SHALL BE INCIDENTAL AND NO SEPARATE PAYMENT SHALL BE MADE.

14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO STOCKPILE NECESSARY MATERIAL ON-SITE OR AT A SECURED OFF-SITE LOCATION AT NO ADDITIONAL EXPENSE TO HARRIS COUNTY. ANY SUITABLE EXCAVATED MATERIAL ON THE PROJECT WHICH IS AVAILABLE AT THE TIME OF NEED WHETHER FROM STORM SEWER, ROADWAY, AND/OR CHANNEL EXCAVATION, SHALL BE USED BEFORE BORROW IS BROUGHT ON-SITE.

15. MANHOLES, JUNCTION BOXES, INLETS, AND RISERS ARE TO BE PRE-CAST OR CAST IN PLACE.

UTILITY COMPANY NOTES

CENTERPOINT ENERGY:
WARNING: OVERHEAD LINES MAY EXIST ON THE PROPERTY. WE HAVE NOT ATTEMPTED TO MARK THOSE LINES SINCE THEY ARE CLEARLY VISIBLE, BUT YOU SHOULD LOCATE THEM PRIOR TO BEGINNING ANY CONSTRUCTION. TEXAS LAW, SECTION 752, HEALTH & SAFETY CODE, FORBIDS ALL ACTIVITIES IN WHICH PERSONS OR THINGS MAY COME WITHIN SIX (6) FEET OF LIVE OVERHEAD HIGH VOLTAGE LINES. CONTRACTOR AND OWNERS ARE LEGALLY RESPONSIBLE FOR SAFETY OF CONSTRUCTION WORKERS UNDER THIS LAW FOR LINES TO BE TURNED OFF OR MOVED; CALL HL&P AT 713-228-7400.

TO STAKE OUR UNDERGROUND FACILITIES, PLEASE CALL THE UCC 713-223-4567, OR TOLL FREE 1-800-699-8344 AT LEAST 48 HOURS BEFORE STARTING EXCAVATION.

NOTE: LOCATION OF HL&P CO. FACILITIES ARE APPROXIMATE AND HAVE NOT BEEN VERIFIED BY ACTUAL FIELD CHECK.

CENTERPOINT ENERGY-ENTEX:
CAUTION: UNDERGROUND GAS FACILITIES.
LOCATION OF ENTEX FACILITIES (TO INCLUDE UNIT GAS TRANSMISSION, SAN JACINTO GAS TRANSMISSION, AND/OR INDUSTRIAL GAS SUPPLY CORPORATION WHERE APPLICABLE) ARE SHOWN IN AN APPROXIMATE LOCATION ONLY. THE CONTRACTOR SHALL CONTACT THE UTILITY COORDINATING COMMITTEE AT 713-223-4567 OR 1-800-669-8344 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UTILITIES FIELD LOCATED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK AND AGREE TO BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY HIS/HER FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND FACILITIES. THE RELOCATION OF LINES DONE AT CONTRACTOR'S EXPENSE.

SBC: THE LOCATIONS OF SBC FACILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THIS FAILURE TO EXACTLY LOCATE AND PRESERVE THESE UNDERGROUND UTILITIES.

THE CONTRACTOR SHALL CALL 1-800-344-8377 A MINIMUM OF 48 HOURS PRIOR TO CONSTRUCTION TO HAVE UNDERGROUND LINES FIELD LOCATED.

WHEN EXCAVATING WITHIN EIGHTEEN INCHES (18") OF THE INDICATED LOCATION OF SBC FACILITIES, ALL EXCAVATIONS MUST BE ACCOMPLISHED USING NON-MECHANIZED EXCAVATION PROCEDURES. WHEN BORING, THE CONTRACTOR SHALL EXPOSE THE SBC FACILITIES.

WHEN SBC FACILITIES ARE EXPOSED, THE CONTRACTOR WILL PROVIDE SUPPORT TO PREVENT DAMAGE TO THE CONDUIT DUCTS OR CABLES. WHEN EXCAVATING NEAR TELEPHONE POLES THE CONTRACTOR SHALL BRACE THE POLE FOR SUPPORT.

STREET AND BRIDGE NOTES

1. EXISTING PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED TO THE CITY OF DICKINSON STANDARDS AND/OR GALVESTON COUNTY STANDARDS.

2. CONDITION OF THE ROAD AND/OR RIGHT-OF-WAY, UPON COMPLETION OF JOB SHALL BE AS GOOD AS OR BETTER THAN PRIOR TO STARTING WORK.

3. CONTRACTOR SHALL COMPLY WITH O.S.H.A. REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING.

4. ADEQUATE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION AND ANY DRAINAGE DITCH OR STRUCTURE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO THE SATISFACTION OF THE OWNING AUTHORITY.

5. THE CONTRACTOR MUST KEEP ALL EXISTING STREETS CLEAN OF CONSTRUCTION RELATED DEBRIS AT ALL TIMES.

6. THE FINISHED PAVEMENT SURFACE SHALL NOT DEVIATE FROM THE ESTABLISHED GRADE AND CROSS-SECTION MORE THAN 1/8" (INCH) IN TEN FEET WHEN TESTED WITH A STRAIGHT EDGE PLACED PARALLEL TO THE CENTERLINE AND NOT MORE THAN 1/4" (INCH) IN TEN FEET AT RIGHT ANGLES TO THE CENTERLINE.

SWPPP CONSTRUCTION NOTES

1. CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AND REINFORCED FILTER FABRIC BARRIER ALONG ROAD AND SIDE DITCHES AT LOCATIONS SHOWN ON THE TYPICAL STORM WATER POLLUTION PREVENTION (SWPP) PLANS TO KEEP SILT AND OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS AND DITCHES EVENTUALLY POLLUTING THE RECEIVING STORM.

2. DURING THE EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATION MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT. ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON PAVEMENTS OR DRIVEWAYS SHALL BE SWEPT BACK INTO THE EXCAVATED AREA.

3. CONTRACTOR SHALL CLEAN UP THE EXISTING STREET INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT OR ROCK TRACKED FORM THE EXCAVATED AREA.

4. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.

5. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN(14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.

- DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED.
- AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
- STRUCTURAL CONTROL MEASURES.
- LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.

6. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND OR CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION ON BACKFILLING OPERATIONS, SUCH AREAS SHALL BE REPLACED BY SEEDING OR SODDING. SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING.

THE STATE OF TEXAS
COUNTY OF GALVESTON

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/18/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

MCGilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019
2	FOR CONSTRUCTION	6/25/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

CIVIL GENERAL NOTES

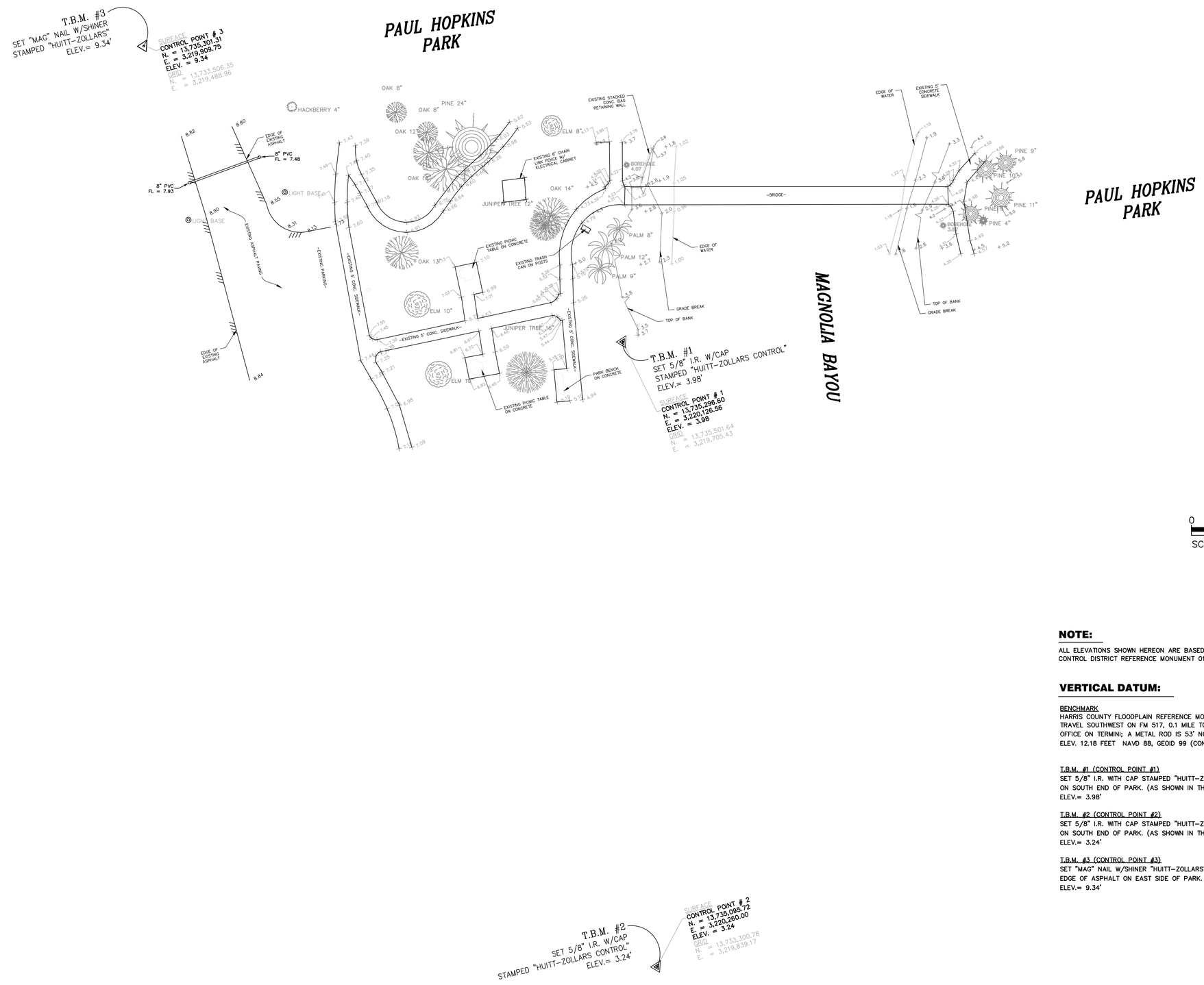
Project number	R308586.01
Date	6/25/2019
Drawn by	CG
Checked by	GW

C2

Scale

CADFILE: I:\R308586.01 - Post Storm Damage Assessment\10 CADD & BIM\10.1 AutoCAD\PAUL HOPKINS PARK BRIDGE\CIVIL SITE PLAN.dwg Plotted: Tue, Jun, 25, 2019 @ 3:10 PM By: cgilliland

NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.



0 10 20 40

SCALE 1"=20' FEET

NOTE:

ALL ELEVATIONS SHOWN HEREON ARE BASED ON THE PUBLISHED HARRIS COUNTY FLOOD CONTROL DISTRICT REFERENCE MONUMENT 010065

VERTICAL DATUM:

BENCHMARK
HARRIS COUNTY FLOODPLAIN REFERENCE MONUMENT No. 010065, FROM OLD GALVESTON AND FM 517; TRAVEL SOUTHWEST ON FM 517, 0.1 MILE TO NEVADA, THEN NORTHWEST ON NEVADA 0.05 MILE TO POST OFFICE ON TERMINI; A METAL ROD IS 53' NORTHWEST OF THE CENTERLINE OF TERMINI.
ELEV. 12.18 FEET NAVD 88, GEOID 99 (CONUS), 2001 ADJUSTMENT

T.B.M. #1 (CONTROL POINT #1)
SET 5/8" I.R. WITH CAP STAMPED "HUITT-ZOLLARS CONTROL" LOCATED 28' NORTHEAST OF PARK BENCH ON SOUTH END OF PARK. (AS SHOWN IN THE DRAWING)
ELEV.= 3.98'

T.B.M. #2 (CONTROL POINT #2)
SET 5/8" I.R. WITH CAP STAMPED "HUITT-ZOLLARS CONTROL" LOCATED 254' SOUTHEAST OF PARK BENCH ON SOUTH END OF PARK. (AS SHOWN IN THE DRAWING)
ELEV.= 3.24'

T.B.M. #3 (CONTROL POINT #3)
SET "MAG" NAIL W/SHINER "HUITT-ZOLLARS" LOCATED 69' NORTWEST OF LIGHT BASE ON WEST SIDE OF EDGE OF ASPHALT ON EAST SIDE OF PARK. (AS SHOWN IN THE DRAWING)
ELEV.= 9.34'

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MC Gilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

TOPOGRAPHIC SURVEY

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

C3

Scale

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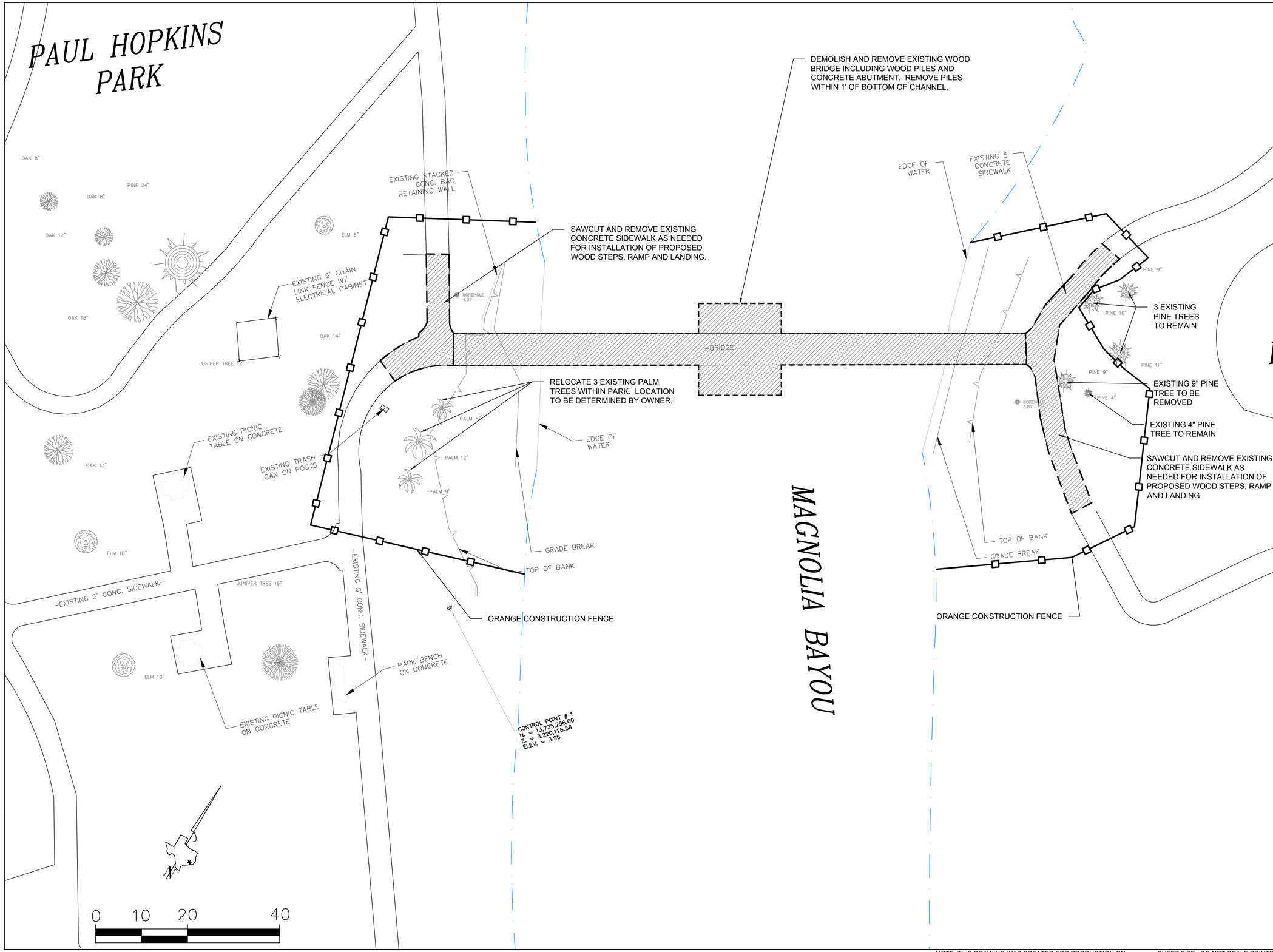
1" = 20'



THE STATE OF TEXAS
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No.	Description	Date
1	FOR BIDDING	6/18/2019
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GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

DEMOLITION PLAN

Project number	R308586.01
Date	6/25/2019
Drawn by	CG
Checked by	GW

C4

Scale 1" = 10'

NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.

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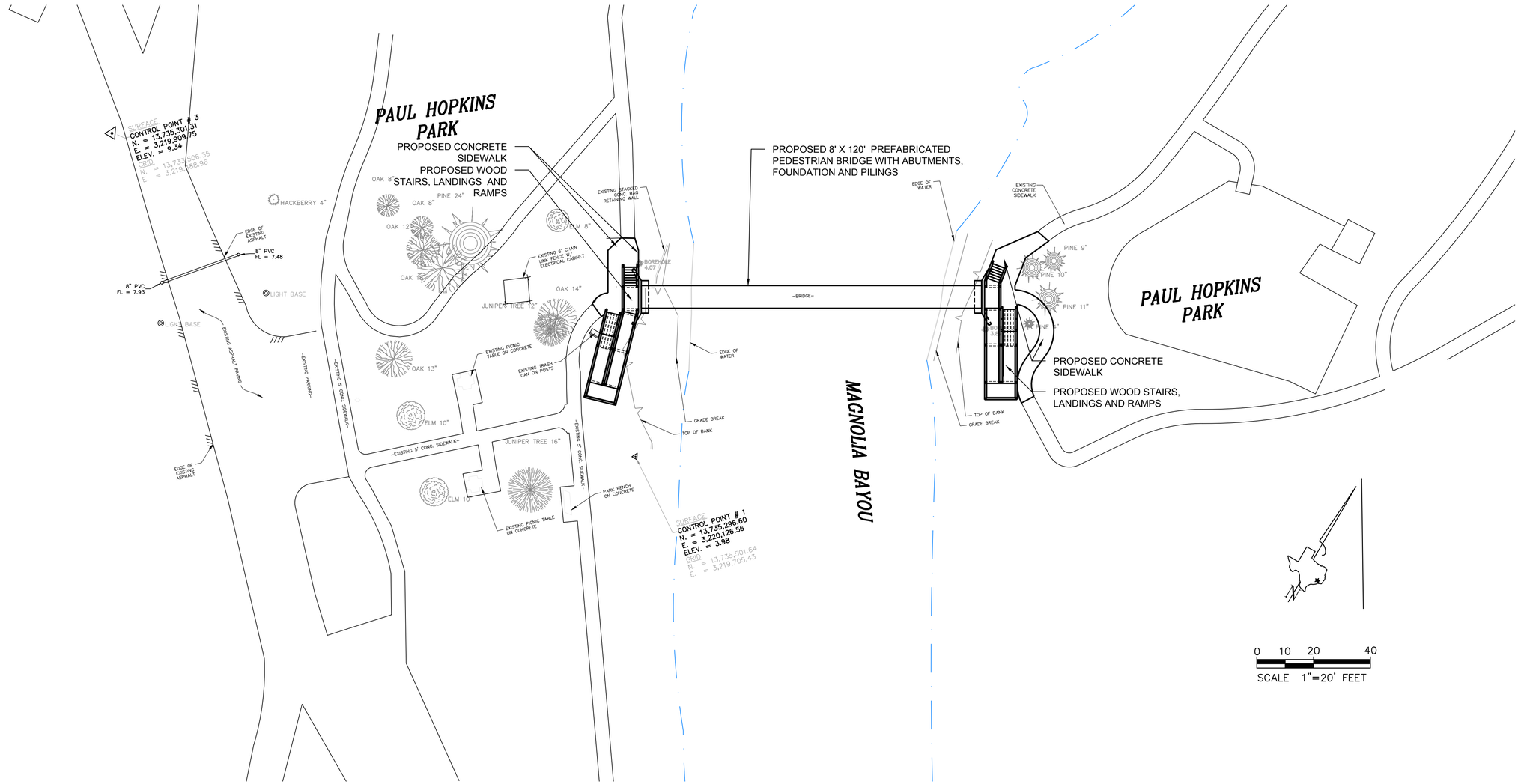

THE STATE OF TEXAS
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MC Gilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

OVERALL SITE PLAN

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

C5

Scale 1" = 20'

CADFILE: I:\R308586.01 - Post Storm Damage Assessment\10 CADD & BIM\10.1 AutoCAD\PAUL HOPKINS PARK BRIDGE\CIVIL SITE PLAN.dwg Plotted: Tue, Jun 18, 2019 @ 3:37 PM By: cgilliland

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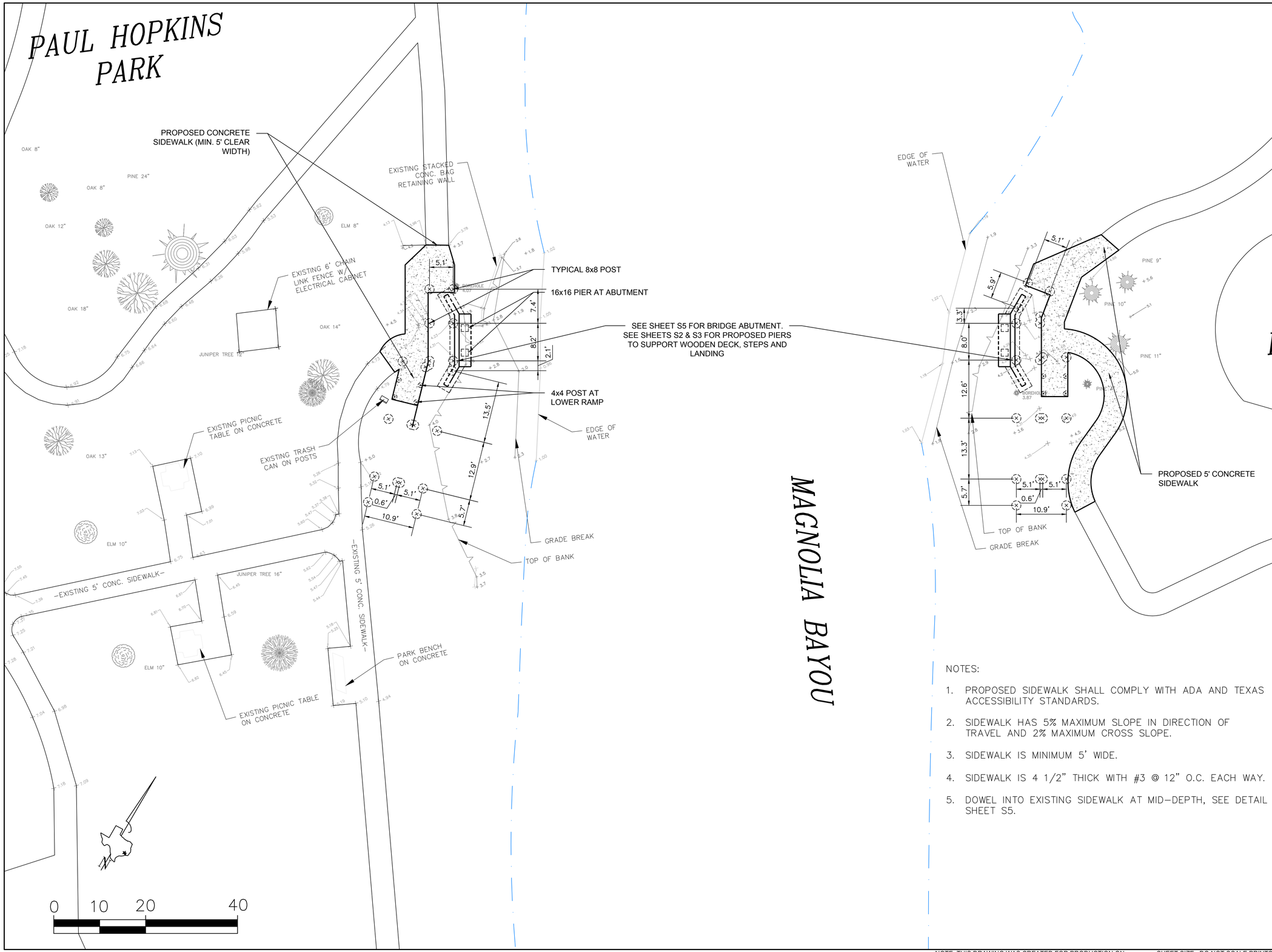

NOTES:

1. PROPOSED SIDEWALK SHALL COMPLY WITH ADA AND TEXAS ACCESSIBILITY STANDARDS.
2. SIDEWALK HAS 5% MAXIMUM SLOPE IN DIRECTION OF TRAVEL AND 2% MAXIMUM CROSS SLOPE.
3. SIDEWALK IS MINIMUM 5' WIDE.
4. SIDEWALK IS 4 1/2" THICK WITH #3 @ 12" O.C. EACH WAY.
5. DOWEL INTO EXISTING SIDEWALK AT MID-DEPTH, SEE DETAIL SHEET S5.

THE STATE OF TEXAS
COUNTY OF GALVESTON

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MCGilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

FOUNDATION PLAN

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

C6

Scale 1:10

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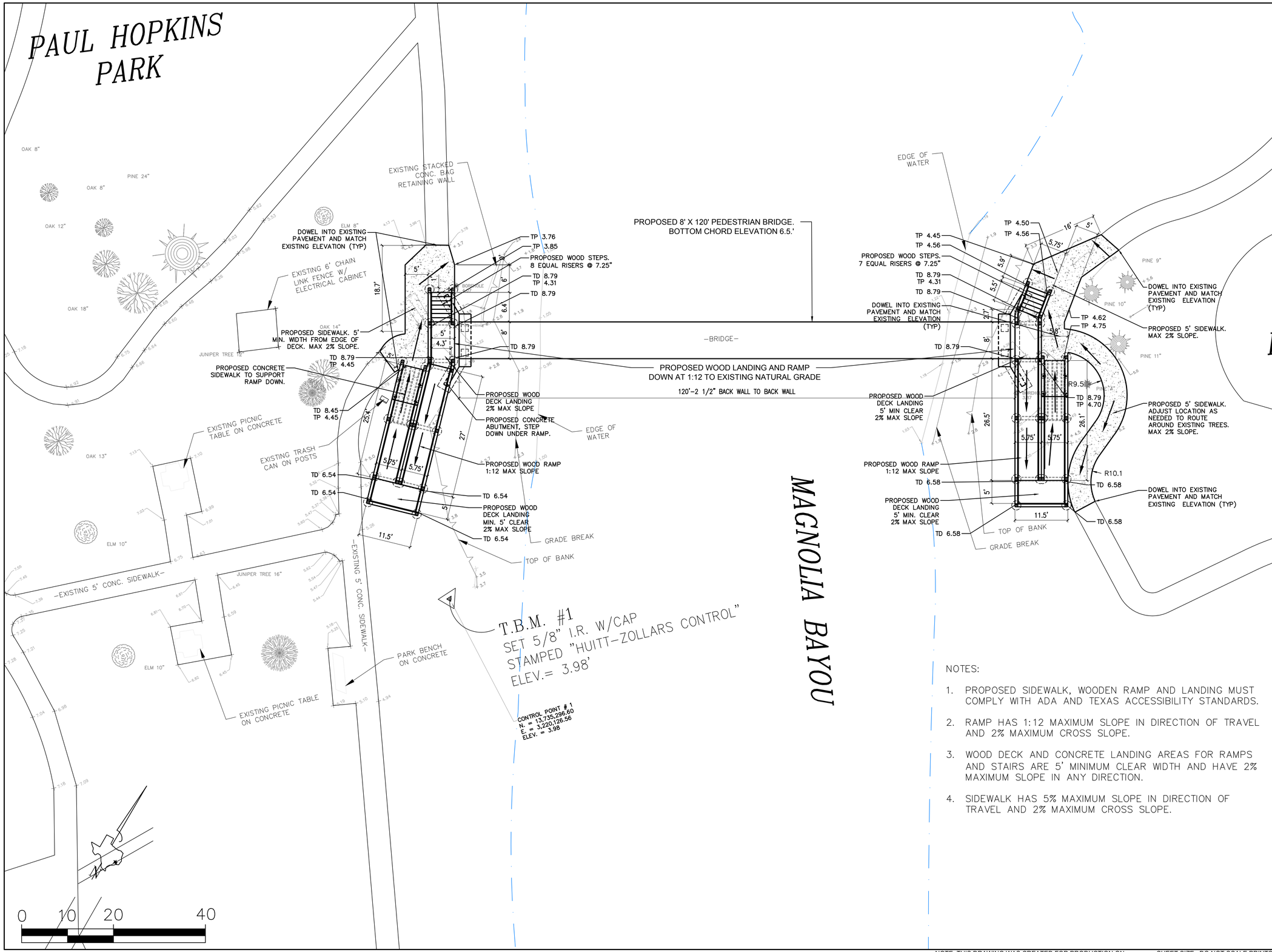


NOTES:

1. PROPOSED SIDEWALK, WOODEN RAMP AND LANDING MUST COMPLY WITH ADA AND TEXAS ACCESSIBILITY STANDARDS.
2. RAMP HAS 1:12 MAXIMUM SLOPE IN DIRECTION OF TRAVEL AND 2% MAXIMUM CROSS SLOPE.
3. WOOD DECK AND CONCRETE LANDING AREAS FOR RAMPS AND STAIRS ARE 5' MINIMUM CLEAR WIDTH AND HAVE 2% MAXIMUM SLOPE IN ANY DIRECTION.
4. SIDEWALK HAS 5% MAXIMUM SLOPE IN DIRECTION OF TRAVEL AND 2% MAXIMUM CROSS SLOPE.

THE STATE OF TEXAS
COUNTY OF GALVESTON

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/18/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

MCGilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

ENGLARGED SITE PLAN

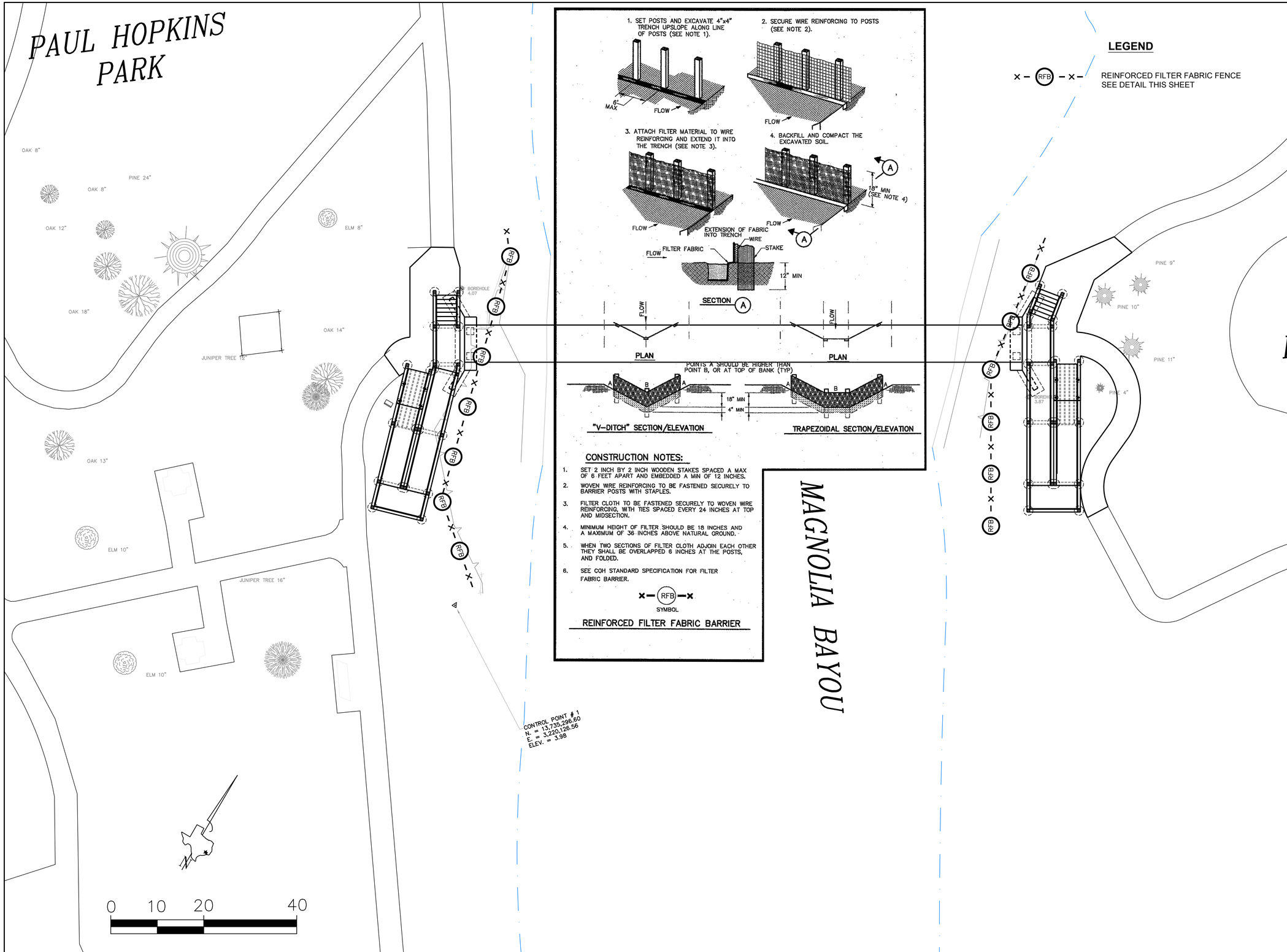
Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

C7

Scale 1:10

NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.

CADFILE: I:\R308586.01 - Post Storm Damage Assessment\10 CADD & BIM\10.1 AutoCAD\PAUL HOPKINS PARK BRIDGE\CIVIL SITE PLAN.dwg Plotted: Tue, Jun. 18, 2019 @ 3:37 PM By: cgilliland



THE STATE OF TEXAS
COUNTY OF GALVESTON

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No.	Description	Date
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GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

SWPPP & DETAILS

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
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C8

Scale 1:10

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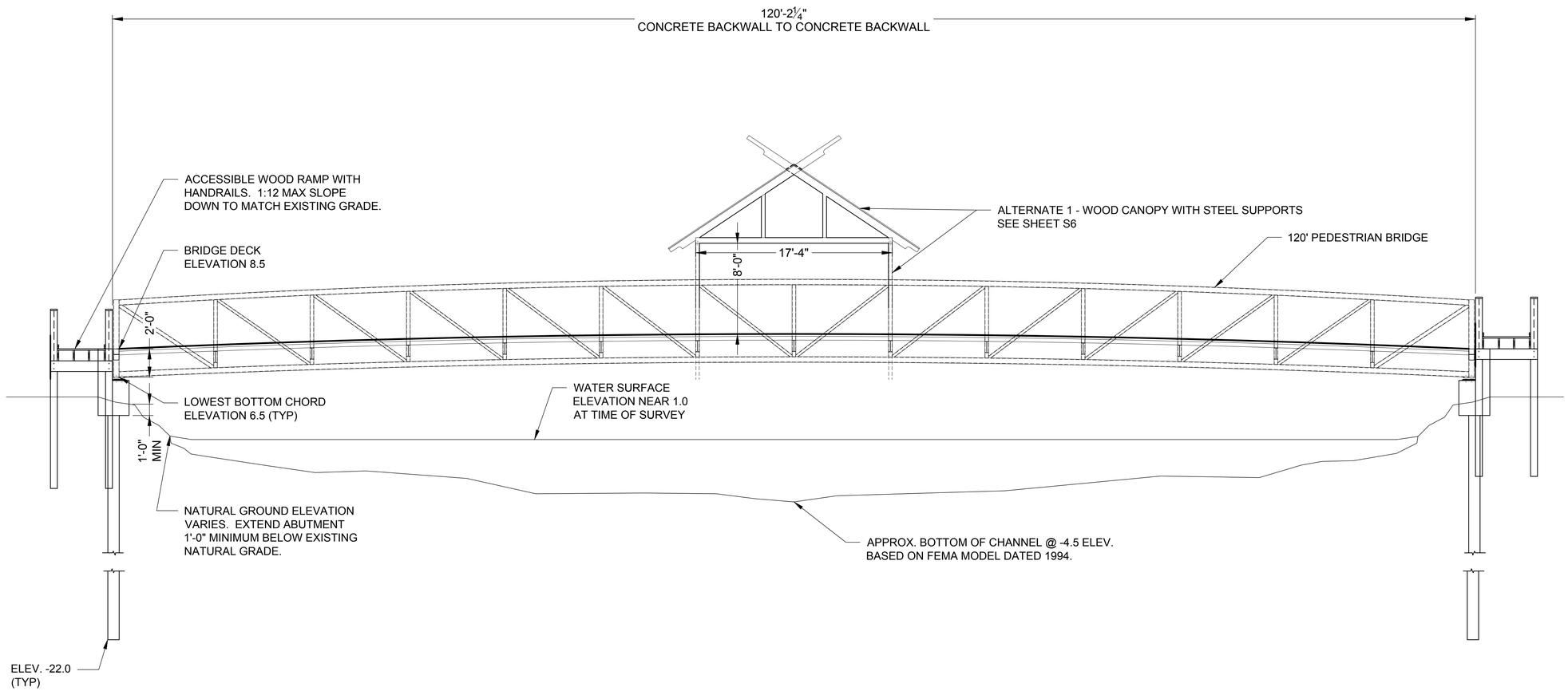

THE STATE OF TEXAS
COUNTY OF GALVESTON

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No.	Description	Date
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GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

PROPOSED BRIDGE ELEVATION

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

A1

Scale 3/16" = 1'-0"

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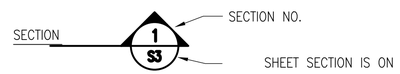
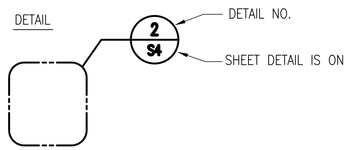
STRUCTURAL ABBREVIATIONS

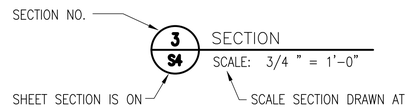
@	AT
ACI	AMERICAN CONCRETE INSTITUTE
ADD'L	ADDITIONAL
ADJ	ADJACENT
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ARCH	ARCHITECTURAL
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERING
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
AWS	AMERICAN WELDING SOCIETY
BLDG	BUILDING
BOT OR B	BOTTOM OR BOTTOM MOST
BW	BASEMENT WALL
C	CHANNEL, COMPRESSION
℄	CENTERLINE
C/C	CENTER TO CENTER
CANT	CANTILEVER
CJT	CONTROL JOINT
CJ	CONSTRUCTION JOINT
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONT	CONTINUOUS
DBA	DEFORMED BAR ANCHOR
DET	DETAIL
DIA OR Φ	DIAMETER
DIAG	DIAGONAL
DL	DEAD LOAD
Do	DITTO
DS	DOUBLE STIRRUP
DWG	DRAWING
DWL	DOWEL
DWN OR DN	DOWN
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EQ	EQUAL
EQUIP	EQUIPMENT
EREC	ERECTION
EW	EACH WAY
EXIST	EXISTING
EXT	EXTERIOR
FD	FLOOR DRAIN
FDN	FOUNDATION
FIN	FINISHED, FINISH
FF	FINISH FLOOR
FLG	FLANGE
FLR	FLOOR
FRMG	FRAMING
FS	FAR SIDE
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GW	GRADE WALL
HCA	HEADED CONCRETE ANCHOR
HORIZ OR H	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
ID	INSIDE DIAMETER
IN OR "	INCH
INT	INTERIOR
JST	JOIST
JT	JOINT
K	KIPS, JOIST SERIES
KB	KNEE BRACING
KSI	KIPS PER SQUARE INCH
L	ANGLE
LAB	LABORATORY
LB	POUND
LG	LONG
LGT	LENGTH
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
MAT'L	MATERIAL
MAX	MAXIMUM
MC	MOMENT CONNECTION OR MISCELLANEOUS CHANNEL
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MK	MARK NUMBER
MRS	MECHANICAL REBAR SPLICE
MTL	METAL
N	NORTH
NE	NORTH EAST
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO. OR #	NUMBER
NS	NEAR SIDE
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
PL	PLATE
PC	PILE CAP
PEN	PENETRATION
PLUMB	PLUMBING
PROJ	PROJECTION
PSF	POUND PER SQUARE FOOT
PSI	POUND PER SQUARE INCH
RAD OR R	RADIUS
RE:	REFER TO
REINF	REINFORCED, REINFORCING, REINFORCEMENT
REM	REMAINDER
REQ'D	REQUIRED
REV	REVISION
RW	RETAINING WALL
S	SOUTH
SC	SHEAR CONNECTOR
SCHED	SCHEDULE
SE	SOUTH EAST
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SPA	SPACES OR SPACED
SPECS	SPECIFICATIONS
SQ	SQUARE
SF	SQUARE FEET
STA	STATION
STD	STANDARD
STIFF	STIFFENER
STIRR	STIRRUP
STL	STEEL
STRUCT	STRUCTURAL
SW	SOUTH WEST
SYM	SYMMETRICAL
T	TENSION
T&B	TOP AND BOTTOM
THK	THICK
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOL	TOP OF LEDGE
TOS	TOP OF STEEL
TOW	TOP OF WALL
Ts	STRUCTURAL TUBING
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	BEAM END SHEAR
VB	VERTICAL BRACING
VCB	VERTICAL CROSS BRACING
VERT	VERTICAL
W	WIDE FLANGE
W/	WITH
W/O	WITHOUT
WP	WORKING POINT
WT	WEIGHT OR STRUCTURAL TEE CUT FROM WIDE FLANGE BEAM
WWF	WELDED WIRE FABRIC

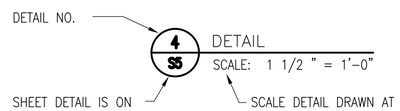
SYMBOLS

SECTION, DETAIL AND ELEVATION CROSS REFERENCES:









LEGEND

(≠)	INDICATES DIMENSION MUST BE VERIFIED PRIOR TO FABRICATION OR CONSTRUCTION.
*	SEE NOTE THIS SECTION OR DRAWING OR SCHEDULE
	FILL OR GRADE
	CONCRETE
	GROUT
	STEEL
	GRANULAR MATERIAL (SAND)
	GRANULAR MATERIAL (GRAVEL, CAPILLARY WATER BARRIER)
	CMU (WALL) (LOADBEARING WHEN SHOWN ON PLANS)
2"	CHANGE IN ELEVATION (SLAB DEPRESSION) AND AMOUNT

GENERAL NOTES

1.0 MATERIALS

A. CAST-IN-PLACE CONCRETE, 28 DAY COMPRESSIVE STRENGTH: 4000 PSI
B. CEMENT: TYPE I.
C. REINFORCING BARS : ASTM A615, GRADE 60 DEFORMED BARS.
D. STRUCTURAL AND MISCELLANEOUS STEEL : ASTM A36, ALL GALVANIZED.
E. WELDING ELECTRODES : AWS A5.5 E70XX.
F. BOLTS AND ANCHORS: FOR GALVANIZED STEEL @ STAIR AND PLATFORM, HOT-DIP GALVANIZED (ASTM A153-CLASS C) BOLTS, WASHERS AND NUTS.
G. DEFORMED BAR ANCHORS: ASTM A496 (MIN. YIELD STRENGTH = 70 KSI)
H. HEADED SHEAR STUDS OR HEADED ANCHORS: ASTM A108.
I. VEHICULAR ACCESS LARGER THAN THE DESIGN LIVE LOAD SHALL BE LIMITED BY PERMANENT PHYSICAL MEANS.
J. ALL GEOTECHNICAL RECOMMENDATIONS CONTAINED IN THE REPORT OF SUBSURFACE INVESTIGATION SHALL BE FOLLOWED. REPORT WAS DATED MAY 2019 AND PRODUCED BY GEOTEST ENGINEERING, INC.

2.0 CONCRETE NOTES

2.1 CONCRETE COVER FOR REINFORCEMENT:

CONCRETE DEPOSITED AGAINST AND PERMANENTLY EXPOSED TO EARTH: _____ 3"

CONCRETE EXPOSED TO EARTH OR WEATHER:
#5 BARS OR SMALLER _____ 1 1/2"
#6 BARS AND LARGER _____ 2"

CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
SLABS , WALLS AND JOISTS _____ 1"
BEAMS, COLUMNS _____ 1 1/2"

2.2 UNLESS SPECIFICALLY NOTED, SCHEDULED OR DETAILED OTHERWISE PROVIDE DEVELOPMENT LENGTH FOR REINFORCING IN CONCRETE COMPONENTS IN ACCORDANCE WITH THE SCHEDULE IN NOTE 2.3 BELOW. THIS SCHEDULE SHALL APPLY TO ALL DEVELOPMENT LENGTHS NOT OTHERWISE NOTED, DETAILED OR SCHEDULED IN THE DRAWINGS OR SPECIFICATIONS.

2.3 REINFORCING BAR DEVELOPMENT LENGTHS Ld:

BAR SIZE GRADE 60	TOP BAR	BOTTOM BAR
#3	24	24
#4	26	24
#5	33	26
#6	39	30
#7	46	36
#8	55	43
#9	70	54
#10	89	69
#11	109	84

NOTES:
A. THIS TABLE IS BASED ON BAR CLEAR SPACING OF 2 BAR DIAMETER MIN FOR BAR CLEAR SPACING LESS THAN 2 BAR DIAMETER, MULTIPLY THE ABOVE VALUES BY 2.0.
B. TOP REINFORCEMENT IS HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12 INCHES OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE DEVELOPMENT LENGTH OR SPLICE.

2.4 LAP SPLICE LENGTHS FOR REINFORCING BARS SHALL BE THE SAME AS TABLE IN NOTE 2.3 ABOVE. WHEN TWO BARS OF DIFFERENT SIZES ARE LAPPED, THE SMALLER SIZE GOVERNS THE LAP LENGTH UNLESS SPECIFICALLY NOTED OTHERWISE.

2.5 WHEN REINFORCING STEEL IS NOTED AS CONTINUOUS REINFORCING IN GRADE BEAMS, WALLS, SLABS AND/OR BEAMS, SPLICE CONTINUOUS REINFORCING STEEL ONLY WHEN UNAVOIDABLE DUE TO STOCK LENGTHS. STAGGER ALL SPLICES A MINIMUM OF 4'-0". ADJACENT BAR SPLICES ARE NOT ACCEPTABLE. LOCATE THE TOP BAR SPLICES WITHIN THE MIDDLE HALF OF THE SPAN AND LOCATE THE BOTTOM BAR SPLICES AT SUPPORTS, OR BETWEEN SUPPORTS AND 1/3 SPAN POINT, UNLESS NOTED OTHERWISE ON PLANS, DETAILS OR SCHEDULES.

2.6 HORIZONTAL WALL REINFORCEMENT SHALL BE CONTINUOUS & SHALL HAVE 90 DEGREE BENDS AND EXTENSIONS, OR CORNER BARS OF EQUIVALENT SIZE LAPPED 42 BAR DIAMETERS, AT CORNERS AND INTERSECTIONS.

2.7 HORIZONTAL JOINTS WILL NOT BE PERMITTED IN CONC. CONSTRUCTION EXCEPT AS SHOWN ON THE CONTRACT DRAWINGS. VERTICAL JOINTS SHALL OCCUR AT CENTER OF SPANS AT LOCATIONS APPROVED BY ENGINEER OF RECORD, U.N.O.

2.8 AT CONSTRUCTION JOINTS SHOWN WITHOUT SHEAR KEYS CONTACT SURFACES SHALL BE CLEAN AND FREE OF LAITANCE AND INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.

2.9 MINIMUM REINFORCING AT OPENINGS: 1 #5 X 4'-0" DIAGONALLY AT EACH CORNER, EACH FACE; 1 #5 AT EACH SIDE, EACH FACE, UNO.

2.10 PROVIDE FULL EMBEDMENT WITH 90° HOOKS FOR ALL DOWELS IF NOT OTHERWISE NOTED; DOWEL SIZE AND SPACING ARE SAME AS MAIN REINFORCING. LENGTH OF DOWELS EACH SIDE OF CONSTRUCTION JOINT SHALL NOT BE LESS THAN BAR'S DEVELOPMENT LENGTH.

2.11 CHAMFER ALL EXPOSED CORNERS 3/4 ", UNLESS NOTED OTHERWISE.

3.0 STEEL NOTES

3.1 DIMENSIONING: TO CENTERLINES OF COLUMNS AND BEAMS, AND BACK OF CHANNELS AND ANGLES; UNLESS SHOWN OTHERWISE.

3.2 ELEVATIONS: REFER TO TOP SURFACE OF FLANGE OF MEMBER, UNLESS SHOWN OTHERWISE.

3.3 WELD SIZES NOT INDICATED ON DRAWINGS: PROVIDE MINIMUM WELD IN ACCORDANCE WITH AISC.

3.4 CONNECTIONS: MINIMUM BOLT DIAMETER SHALL BE 3/4" WITH MINIMUM OF TWO BOLTS PER CONNECTION, UNLESS NOTED OTHERWISE.

3.5 ALL STEEL SHALL BE HOT-DIP GALVANIZED (ASTM A153-CLASS C)

4.0 DESIGN CRITERIA

4.1 BUILDING CODE AND DESIGN STANDARDS
A. BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE STRUCTURES, AMERICAN CONCRETE INSTITUTE (ACI), ACI 318-14: BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, AND ACI 350/350R-06: CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES.
B. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION 15TH EDITION.
C. STRUCTURAL WELDING CODE, AMERICAN WELDING SOCIETY (AWS), AWS D1.1 2015.
D. GEOTECHNICAL INVESTIGATION
E. 2009 INTERNATIONAL BUILDING CODE
F. ASCE 7-05
G. ***VERIFY DESIGN CODE REQUIREMENT FOR BRIDGE***

4.2 LATERAL DESIGN LOADS
A. OCCUPANCY CATEGORY IV, ESSENTIAL FACILITIES.
B. WIND PRESSURE FOR BASIC WIND SPEED OF 145 MPH, EXPOSURE "C", AND IMPORTANCE FACTOR 1.15 ON MAIN WIND FORCE RESISTING SYSTEM.
C. PROJECT IS LOCATED IN SEISMIC LOAD ZONE 0.

4.3 GRAVITY DESIGN LOAD

DEAD LOAD
1. BRIDGE = WEIGHT OF STRUCTURE
2. FUTURE CANOPY = 10 PSF

LIVE LOAD
1. BRIDGE = 100 PSF ***VERIFY***
2. FUTURE CANOPY = 20 PSF

5.0 FOUNDATION NOTES

5.1 FOUNDATION DESIGN IS BASED ON GEOTECHNICAL STUDY PERFORMED BY _____. DATED _____.

5.2 ALLOWABLE BEARING PRESSURE AS SHOWN ON DESIGN DRAWINGS:

SPREAD FOOTING
DEAD LOAD _____ X000 PSF
TOTAL LOAD _____ X000 PSF
DRILLED PIER
DEAD LOAD _____ X000 PSF
TOTAL LOAD _____ X000 PSF

THE STATE OF TEXAS
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STATE OF TEXAS
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5/16/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

STRUCTURAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

S1

Scale **N.T.S.**

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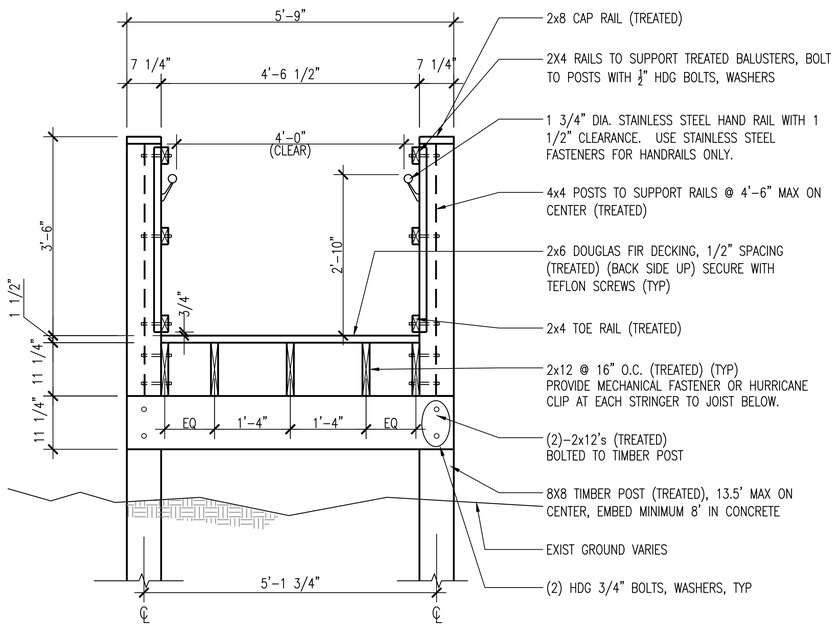
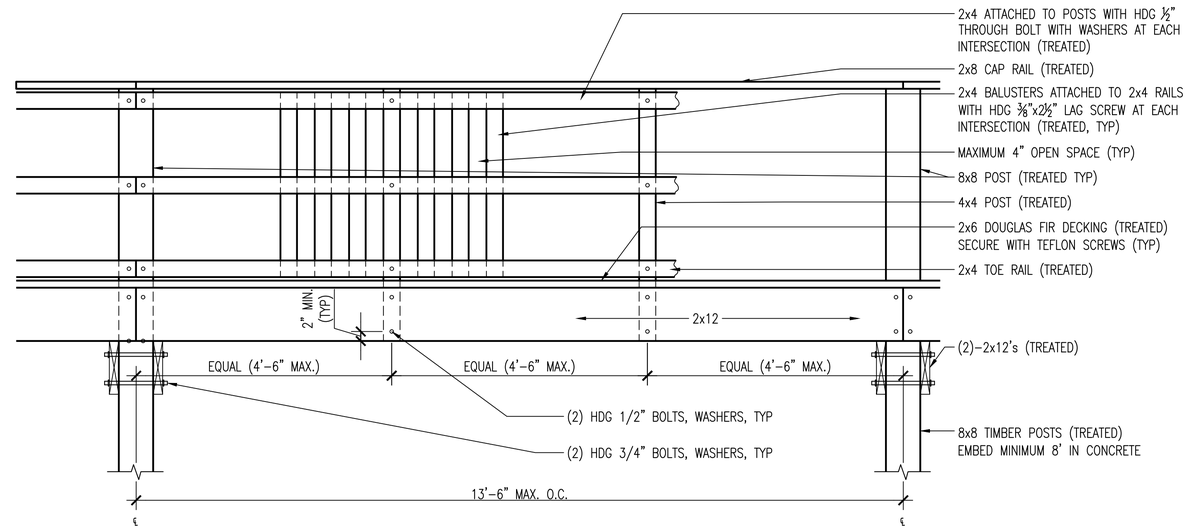
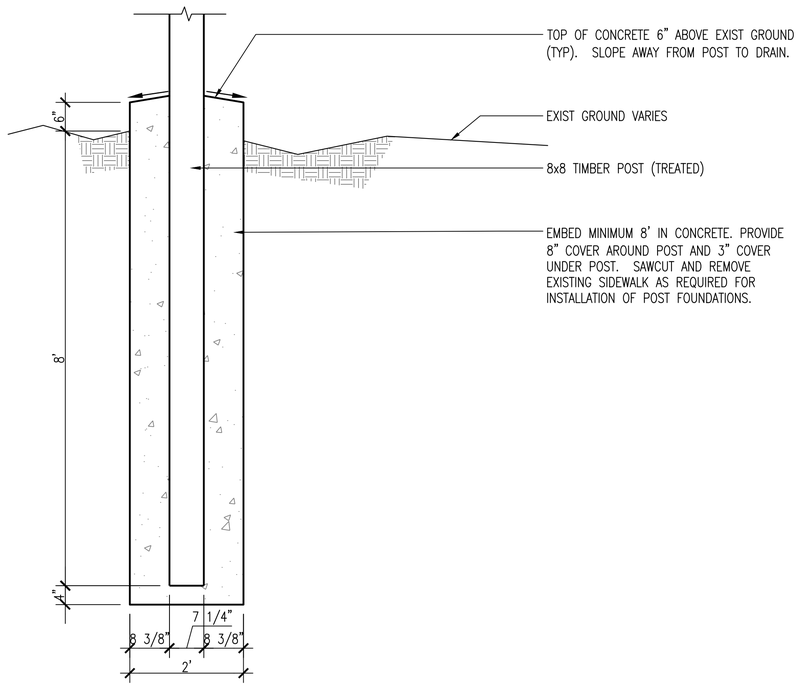
CADFILE: I:\R308586.01 - Post Storm Damage Assessment\10 CADD & BIM\10.1 AutoCAD\PAUL HOPKINS PARK BRIDGES\1 STRUCTURAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS.dwg Plotted: Tue, Jun. 18, 2019 @ 3:37 PM By: cgilliland



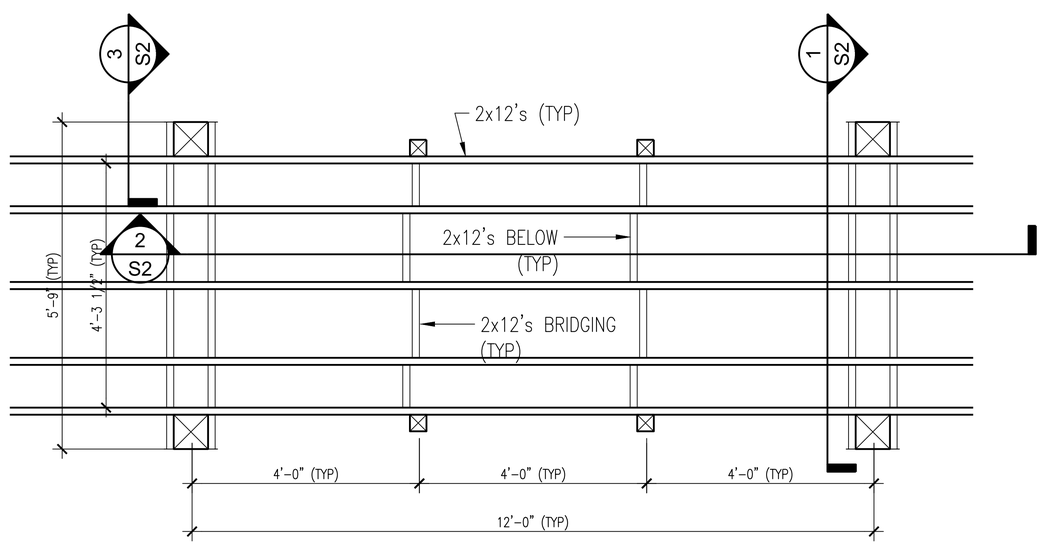
1 S2 RAMP SECTION
SCALE: 3/4" = 1'-0"



2 S2 RAMP SECTION
SCALE: 3/4" = 1'-0"



3 S2 FOUNDATION
SCALE: 3/4" = 1'-0"



4 S2 RAMP PLAN
SCALE: 3/4" = 1'-0"

SEE WOOD FRAMING NOTES ON S3

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No.	Description	Date
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GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

RAMP DETAILS

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S2

Scale

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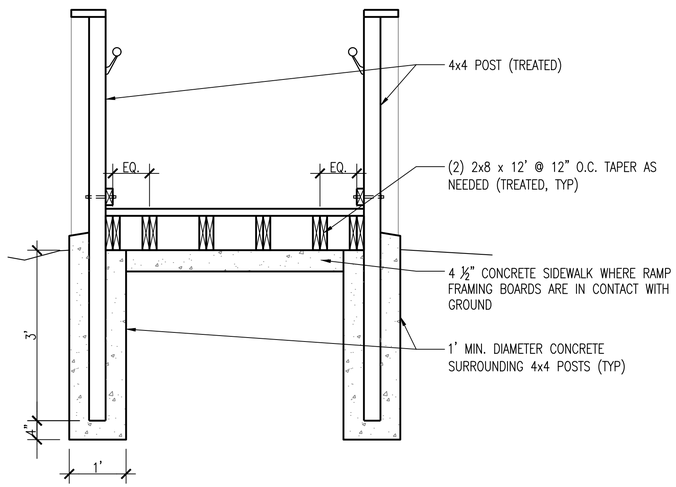
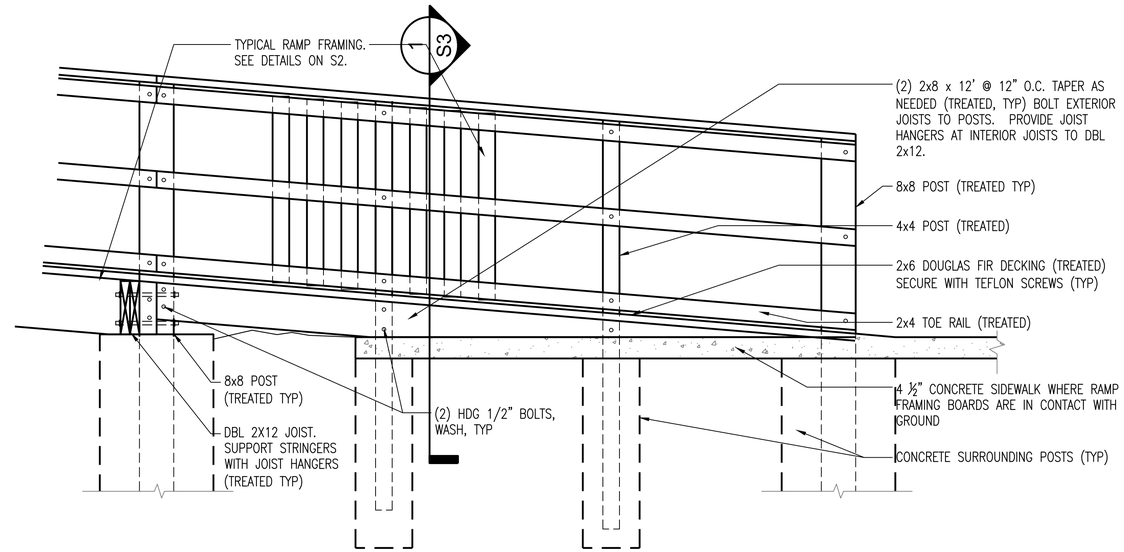


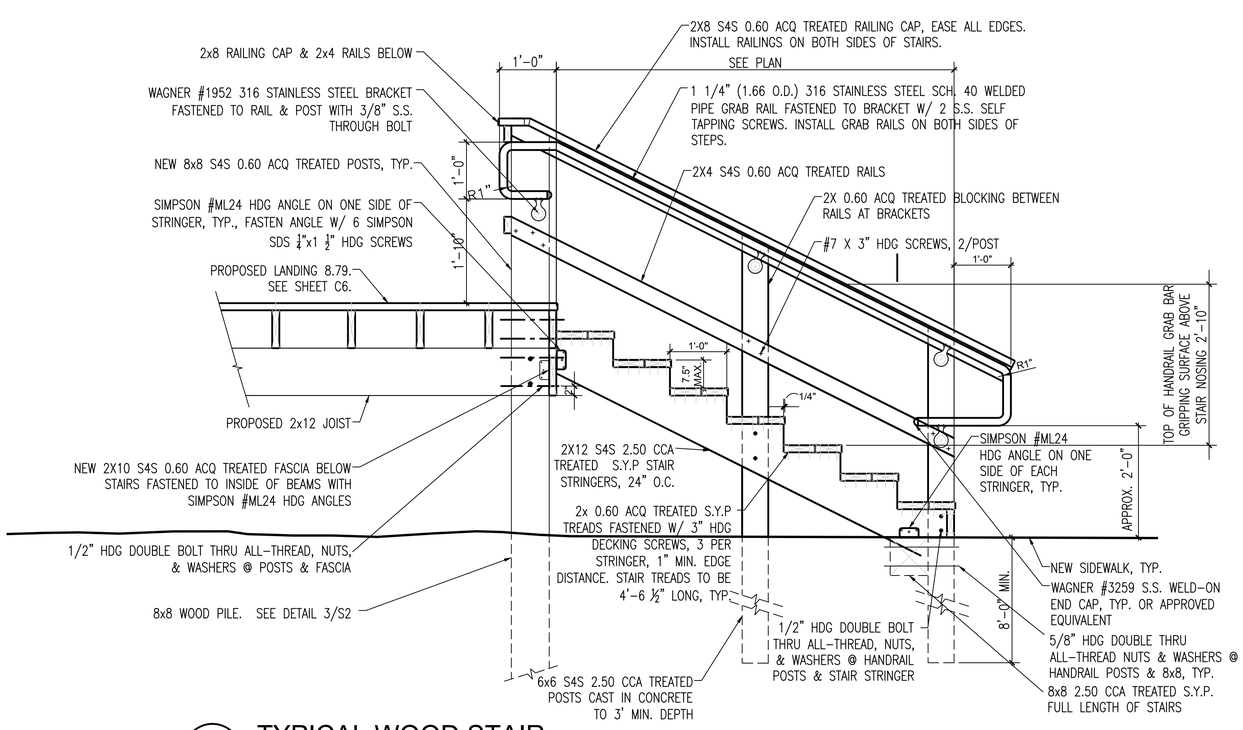
1 S3 RAMP SECTION - LOW END

SCALE: 3/4" = 1'-0"



2 S3 RAMP SECTION - LOW END

SCALE: 3/4" = 1'-0"



3 S3 TYPICAL WOOD STAIR

SCALE: 3/4" = 1'-0"

WOOD FRAMING NOTES:

1. ALL LUMBER SHALL BE KILN DRIED AFTER TREATMENT IN ACCORDANCE WITH AWPA M4.
2. DECKING, HANDRAILS, SLATS, AND RAILING SUPPORTS SHALL BE TREATED WITH ACQ AT 0.6 PCF IN ACCORDANCE WITH AWPA U1 (UC4B).
3. ALL POSTS IN CONTACT WITH GROUND SHALL BE "CCA" TREATED.
4. SURFACE TREATMENT OF FIELD CUTS: ALL FIELD CUTS SHALL BE FIELD TREATED WITH ACQ AT 0.6 PCF IN ACCORDANCE WITH AWPA U1 (UC4B)
5. ALL FASTENERS AND HARDWARE SHALL BE HOT DIP GALVANIZED (HDG) EXCEPT STAINLESS STEEL HANDRAIL REQUIRES STAINLESS STEEL FASTENERS.
6. PROVIDE 4'-6 ½" WIDE STAIR TREADS AND HANDRAILS ON BOTH SIDES OF STAIRS WITH 4'-0" CLEAR.
7. RISERS SHALL BE OF EQUAL HEIGHT NOT TO EXCEED 7.5" TALL.
8. ALL DIMENSIONAL LUMBER SHALL BE SOUTHERN PINE #2 U.N.O.

THE STATE OF TEXAS
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MCGilliland

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GALVESTON COUNTY
PAUL HOPKINS PARK
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RAMP DETAILS

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S3

Scale

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GENERAL NOTES

1. DESIGN STRESSES ARE IN ACCORDANCE WITH "STANDARD SPECIFICATION FOR HIGHWAY BRIDGES" & "GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES" BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).

2. BRIDGE MEMBERS ARE FABRICATED FROM HIGH STRENGTH, LOW ALLOY, ENHANCED ATMOSPHERIC CORROSION RESISTANT ASTM A847 COLD-FORMED WELDED SQUARE AND RECTANGULAR TUBING, AND ASTM A588, ASTM A606, OR ASTM A242 PLATE AND STRUCTURAL SHAPES (Fy=50,000 PSI).

BRIDGE DECKING NOMINAL 3-INCH THICK SELECT STRUCTURAL FIR (Fb=1,400 PSI min.) OR SOUTHERN YELLOW PINE (Fb=1,300 PSI min.). ALKALINE COPPER QUATERNARY (ACQ) TO A 0.4 PCF RETENTION OR TO REFUSAL OR AZOLE BIOCIDE (MCA) TO A 0.06 PCF RETENTION OR TO REFUSAL.

3. THE GAS METAL ARC WELDING PROCESS OR FLUX CORED ARC WELDING PROCESS WILL BE USED. WELDING TO BE IN ACCORDANCE WITH AWS D1.1.

4. ALL TOP AND BOTTOM CHORD SHOP SPLICES TO BE COMPLETE PENETRATION TYPE WELDS. WELD BETWEEN TOP CHORD AND END VERTICAL SHALL BE AS DETAILED.

5. UNLESS OTHERWISE NOTED, WELDED CONNECTIONS SHALL BE FILLET WELDS (OR HAVE THE EFFECTIVE THROAT OF A FILLET WELD) OF A SIZE EQUAL TO THE THICKNESS OF THE LIGHTEST GAGE MEMBER IN THE CONNECTION. WELDS SHALL BE APPLIED AS FOLLOWS:

   A. BOTH ENDS OF VERTICALS, DIAGONALS, AND FLOOR BEAMS SHALL BE WELDED ALL AROUND.
   B. BRACE DIAGONALS WILL BE WELDED ALL AROUND.
   C. MISCELLANEOUS NON-STRUCTURAL MEMBERS WILL BE STITCH WELDED TO THEIR SUPPORTING MEMBERS.

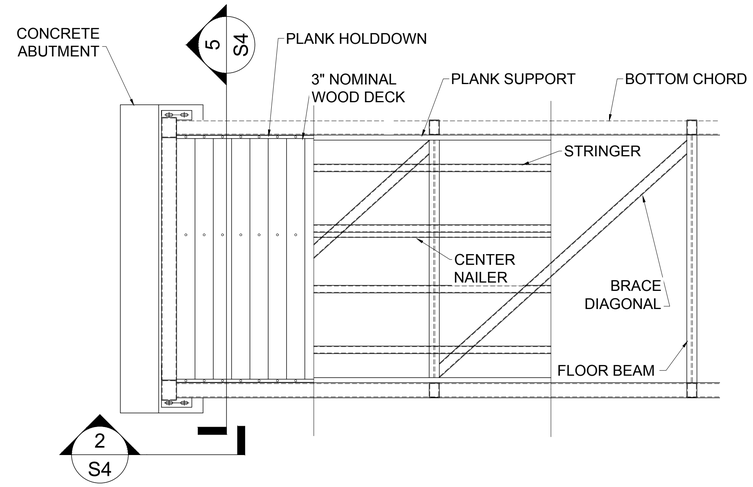
7. BRIDGE DESIGN WAS ONLY BASED ON COMBINATIONS OF THE FOLLOWING LOADS WHICH WILL PRODUCE MAXIMUM CRITICAL MEMBER STRESSES.

   A. 90 PSF UNIFORM LIVE LOADING ON THE FULL DECK AREA OR ONE 10,000 LB VEHICLE LOAD. THE LOAD SHALL BE DISTRIBUTED AS A FOUR-WHEEL VEHICLE WITH 80% OF THE LOAD ON THE REAR WHEELS. THE WHEEL TRACK WIDTH OF THE VEHICLE SHALL BE 6'-0" AND THE WHEEL BASE SHALL BE 10'-0". THE VEHICLE SHALL BE POSITIONED SO AS TO PRODUCE THE MAXIMUM STRESSES IN EACH MEMBER, INCLUDING DECKING.
   B. 35 PSF WIND LOAD ON THE FULL HEIGHT OF THE BRIDGE, AS IF ENCLOSED.
   C. 20 PSF UPWARD FORCE APPLIED AT THE WINDWARD QUARTER POINT OF THE TRANVERSE BRIDGE WIDTH (AASHTO 3.15.3).

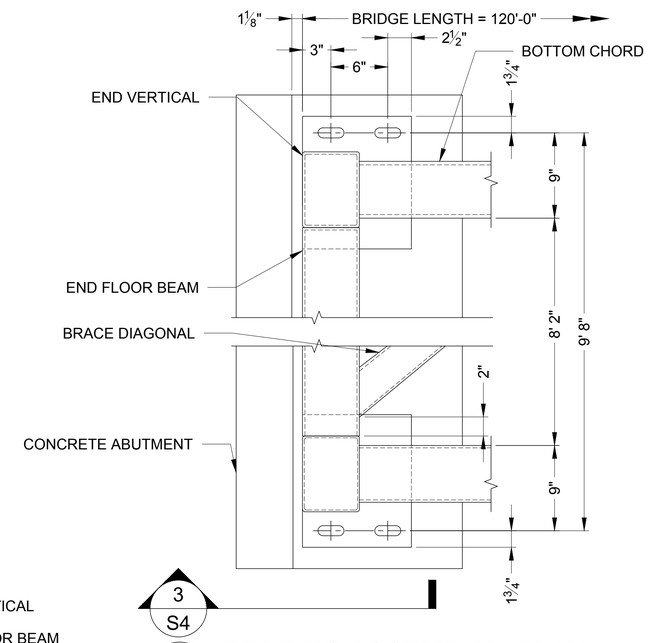
8. CLEANING: ALL EXPOSED SURFACES OF STEEL SHALL BE CLEANED IN ACCORDANCE WITH STEEL STRUCTURES PAINTING COUNCIL SURFACES PREPARATION SPECIFICATIONS NO. 7 BRUSH-OFF BLAST CLEANING. SSPC-SP7-LATEST EDITION.

9. MINIMUM MATERIAL THICKNESS OF 1/4" ON ALL STRUCTURAL MEMBERS.

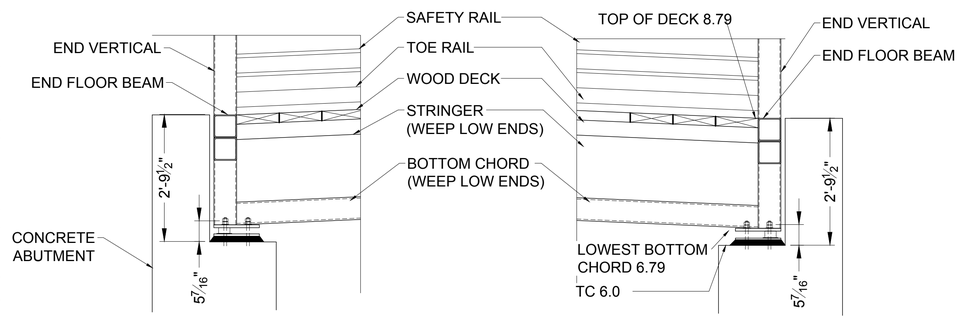
10. IT IS THE OWNER'S RESPONSIBILITY TO KEEP THE DECK FREE FROM SLIP OR TRIP HAZARDS DUE TO CUPPING, SPLITS, GAPS AND SMOOTH SURFACES.



1 S4 BRIDGE PLAN VIEW



2 S4 BEARING ASSEMBLY - PLAN



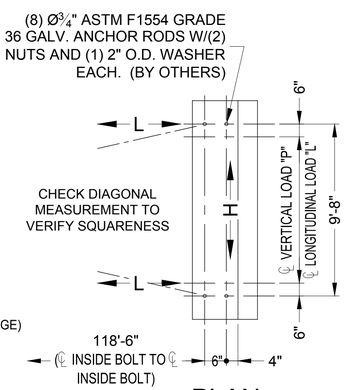
3 S4 BEARING ELEVATION

COMBINE REACTIONS AS PER LOCAL OR GOVERNING BUILDING CODES AS REQUIRED

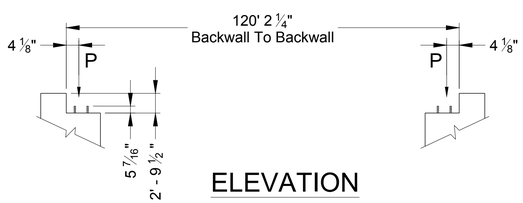
BRIDGE REACTIONS		P (LBS)	H (LBS)	L (LBS)
				+ DOWNWARD LOAD - UPWARD LOAD
DEAD LOAD		11,475		
UNIFORM LIVE LOAD		21,600		
VEHICLE LOAD		10,000		
WIND UPLIFT 20 PSF	WINDWARD	-8,100		
	LEEWARD	-2,700		
WIND		7,755	14,700	
THERMAL				1,725

"P" - VERTICAL LOAD EACH BASE PLATE (4 PER BRIDGE)
"H" - HORIZONTAL LOAD EACH FOOTING (2 PER BRIDGE)
"L" - LONGITUDINAL LOAD EACH BASE PLATE (4 PER BRIDGE)

BRIDGE LIFTING WEIGHT: 45,900 LBS



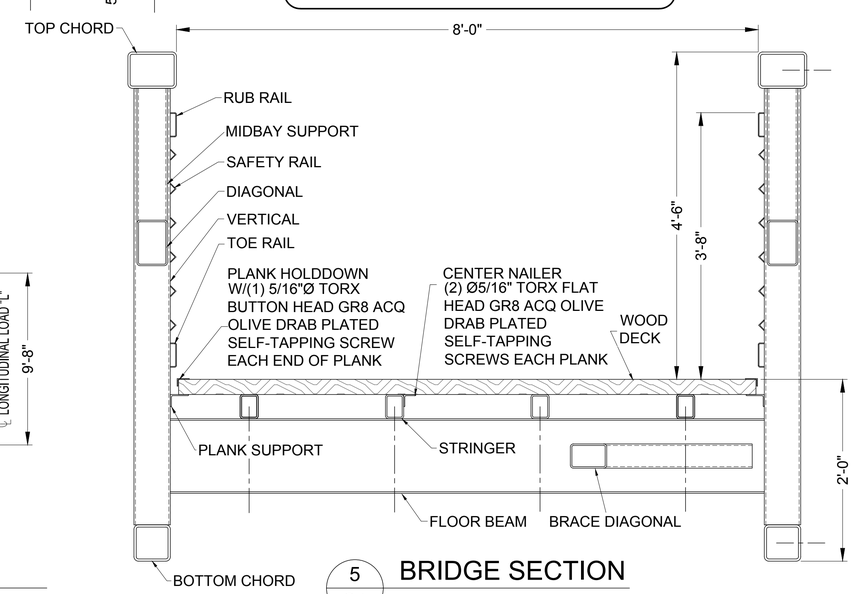
PLAN



ELEVATION

4 S4 ANCHOR BOLTS

SPACING OF SAFETY RAIL PRODUCES OPENINGS OF LESS THAN 4" UP TO A MINIMUM HEIGHT OF 42" ABOVE THE DECK AND OPENINGS OF 8" OR LESS ABOVE 42" FROM DECK.



5 S4 BRIDGE SECTION

THE STATE OF TEXAS
COUNTY OF GALVESTON

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/3/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

MCGilliland

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

BRIDGE DETAILS

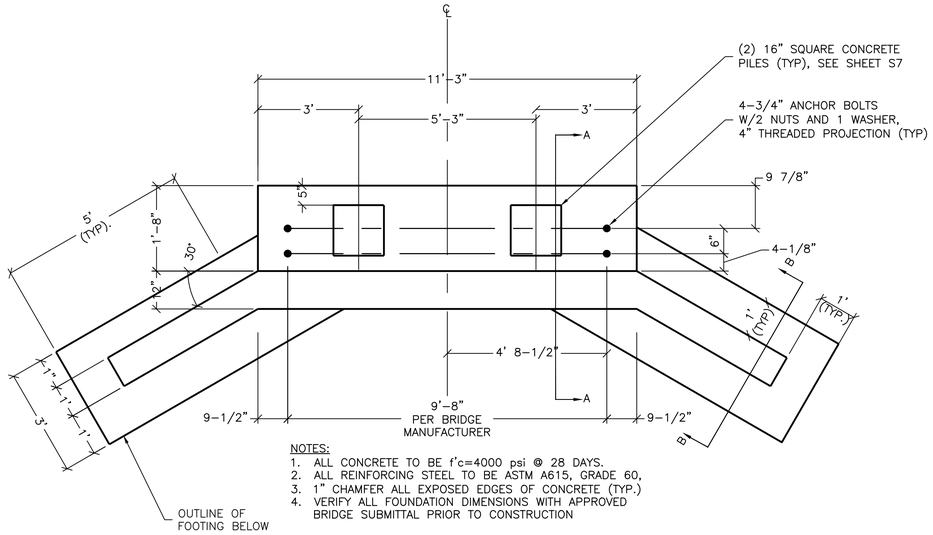
Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

S4

Scale

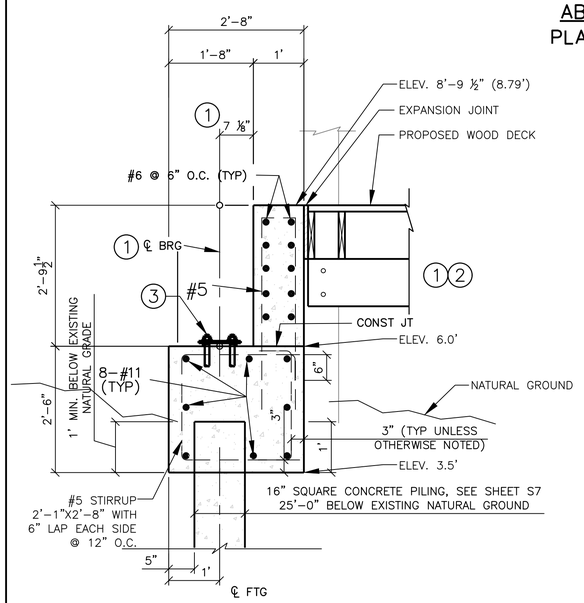
NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.

CADFILE: I:\R308586.01 - Post Storm Damage Assessment\10 CADD & BIM\10.1 AutoCAD\PAUL HOPKINS PARK BRIDGES\4 BRIDGE DETAILS.dwg Plotted: Tue, Jun. 18, 2019 @ 3:38 PM By: cgilliland



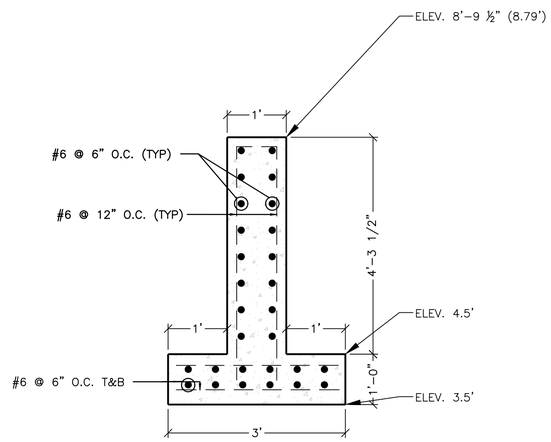
NOTES:
1. ALL CONCRETE TO BE f'c=4000 psi @ 28 DAYS.
2. ALL REINFORCING STEEL TO BE ASTM A615, GRADE 60.
3. 1" CHAMFER ALL EXPOSED EDGES OF CONCRETE (TYP.)
4. VERIFY ALL FOUNDATION DIMENSIONS WITH APPROVED BRIDGE SUBMITTAL PRIOR TO CONSTRUCTION

ABUTMENT PLAN-N.T.S.



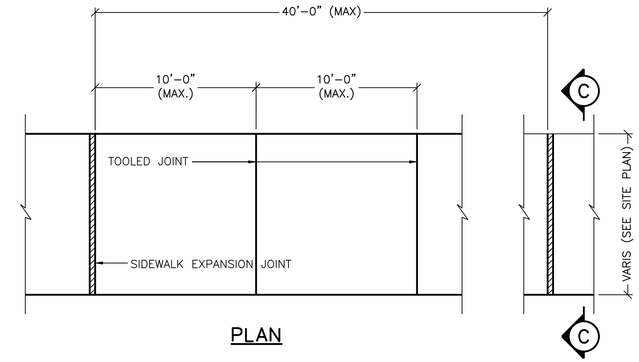
1. ABUTMENT QUANTITIES, DIMENSIONS AND ELEVATIONS ARE BASED ON PRELIMINARY DESIGN INFORMATION BY THE PRE-QUALIFIED TRUSS BRIDGE MANUFACTURERS. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH FINAL TRUSS BRIDGE SUPPLIER. PAY ITEM QUANTITIES WILL NOT BE ADJUSTED BASED ON FINAL MANUFACTURER'S DESIGN DIMENSIONS.
2. INCREASE AS REQUIRED TO MAINTAIN 3" FROM FINISHED GRADE.
3. BRIDGE MANUFACTURER SHALL DESIGN BEARING PLATE, BASE PLATE, SLIDING PLATE AND ANCHOR BOLTS AS REQUIRED FOR EACH END OF BRIDGE.

SECTION A-A

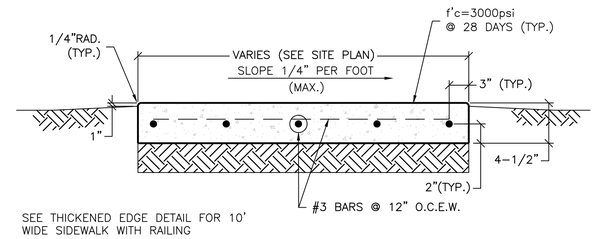


SECTION B-B

NOT TO SCALE



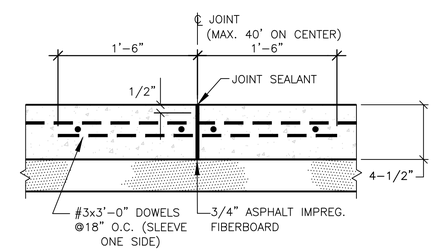
PLAN



SECTION C-C

TYPICAL CONCRETE SIDEWALK DETAIL

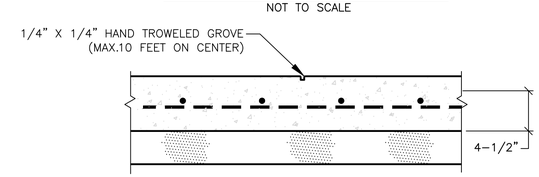
NOT TO SCALE



NOTE: EXPANSION JOINT W/ DOWELS IS REQ'D. AGAINST ALL WALKS AND CURBS.

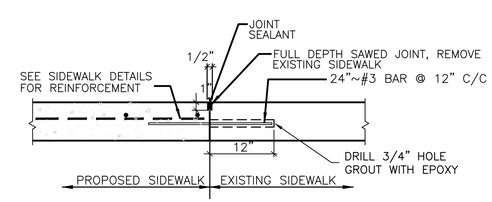
SIDEWALK EXPANSION JOINT

NOT TO SCALE



SIDEWALK TOOLED JOINT

NOT TO SCALE



EXISTING SIDEWALK TIE-IN

NOT TO SCALE

THE STATE OF TEXAS
COUNTY OF GALVESTON

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/18/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

STRUCTURAL DETAILS

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

S5

Scale

NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.

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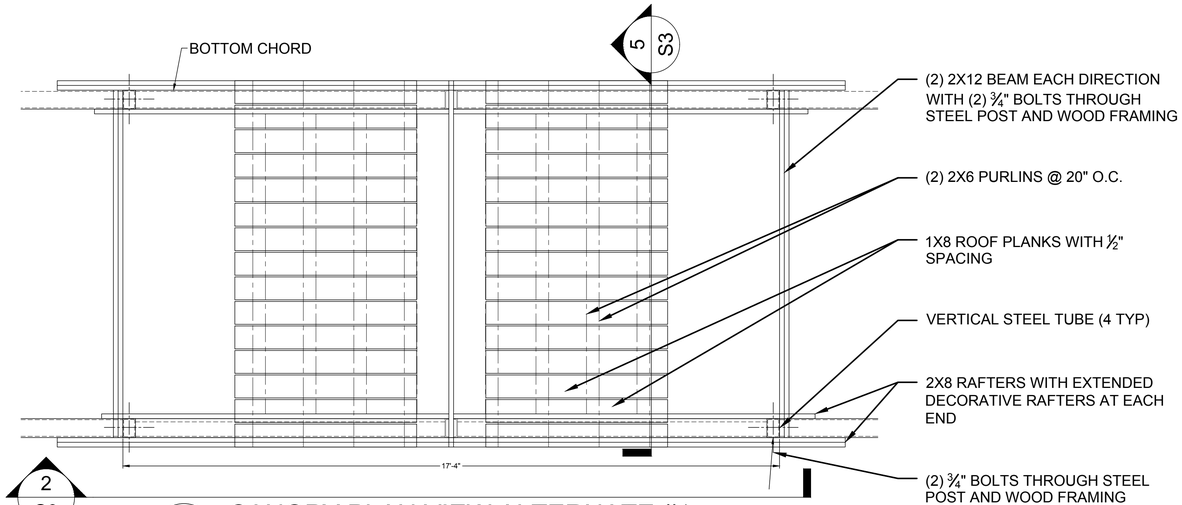
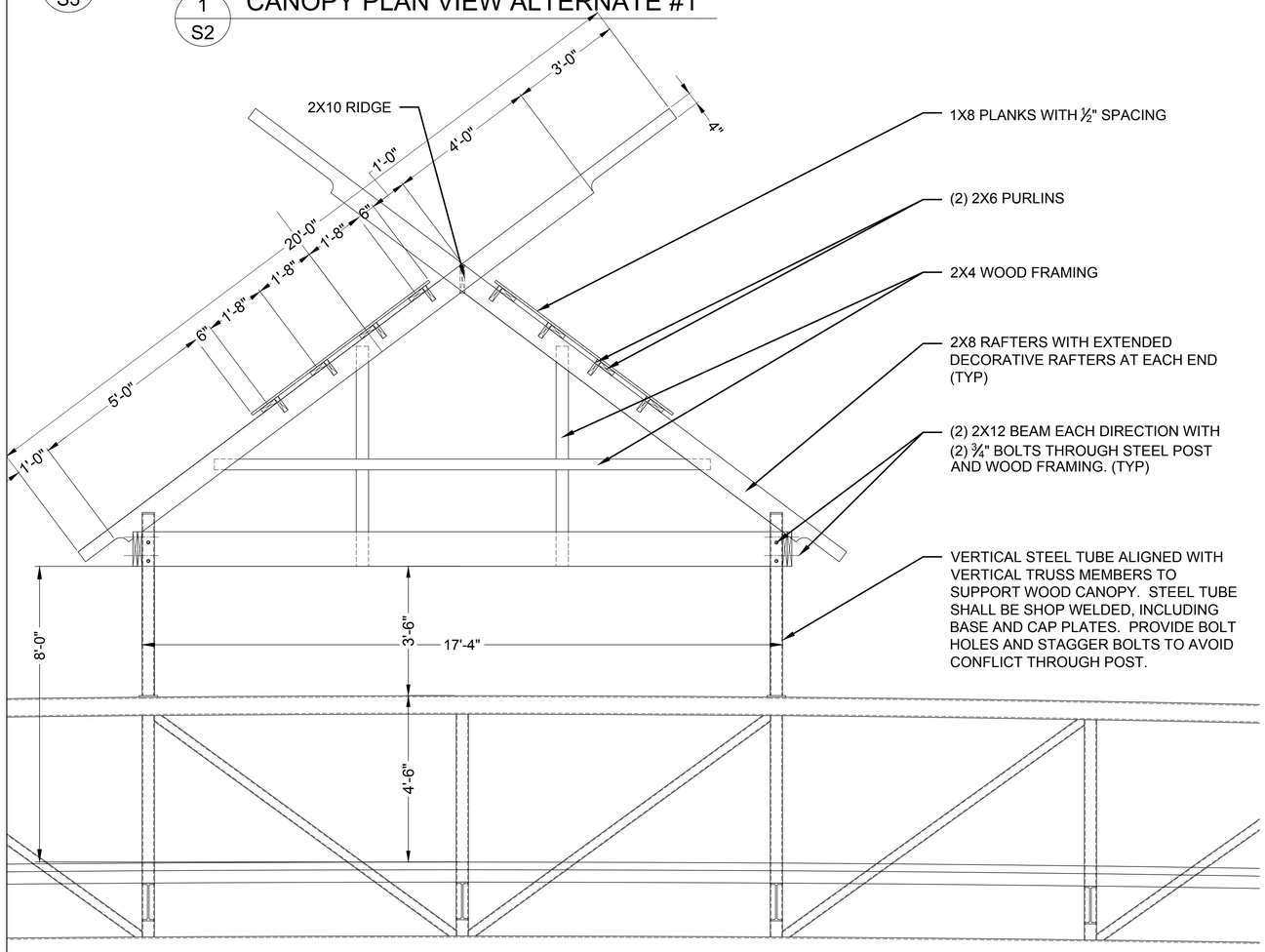


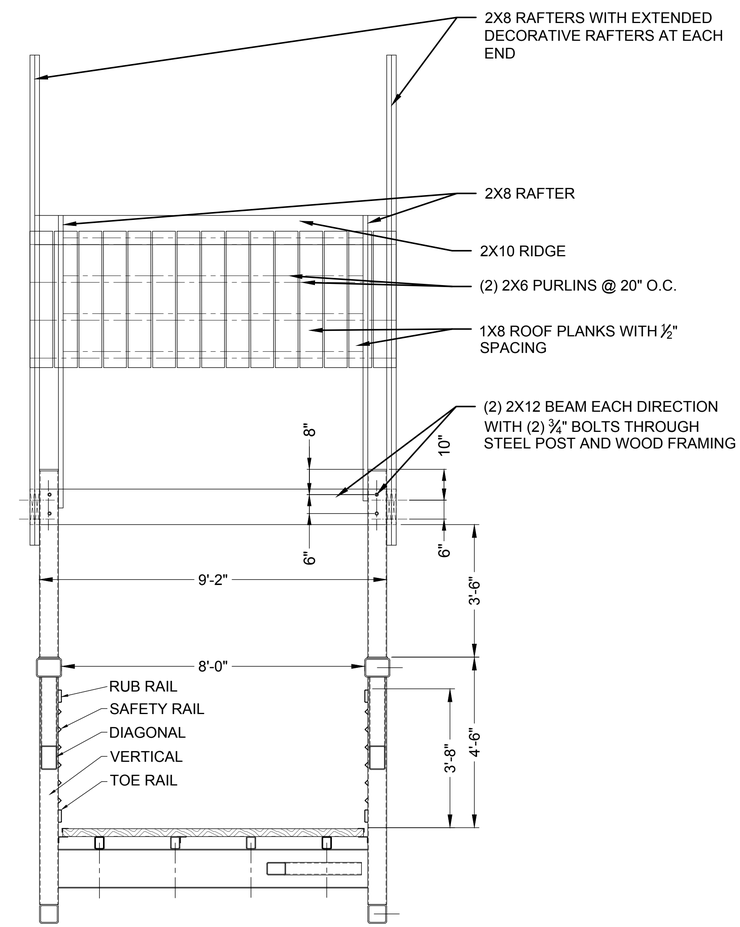
1 S2 CANOPY PLAN VIEW ALTERNATE #1

NOTES:

1. ALTERNATE #1 WOOD CANOPY AT MID-SPAN INCLUDES SHOP WELDED CONNECTIONS OF VERTICAL STEEL TUBES TO BRIDGE AND TIMBER CANOPY.
2. VERTICAL STEEL TO MATCH BRIDGE FINISHES.
3. ALL STEEL HARDWARE SHALL BE HOT DIP GALVANIZED.
4. ALL LUMBER SHALL BE PRESSURE TREATED.



2 S2 CANOPY ELEVATION ALTERNATE #1



5 S3 BRIDGE SECTION W/ ALTERNATE #1

THE STATE OF TEXAS
COUNTY OF GALVESTON

STATE OF TEXAS
M. CATHERINE GILLILAND
90140
LICENSED
PROFESSIONAL ENGINEER
6/3/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

CANOPY ALT #1

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

S6

Scale

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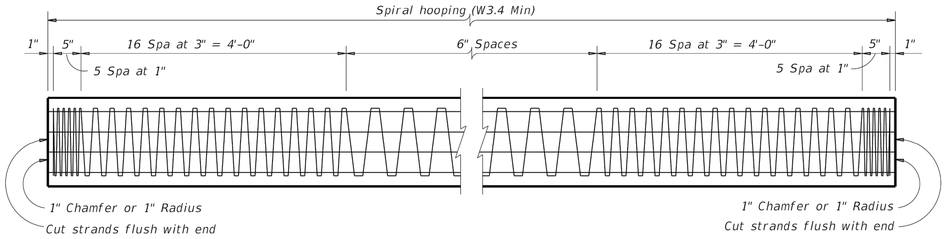
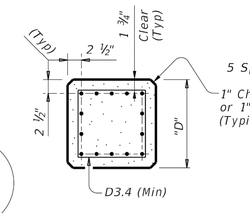
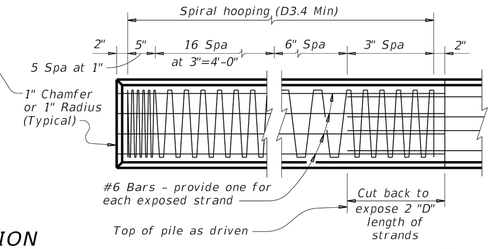


PILE DETAILS



TYPICAL SECTION THRU PILE (1)



PILE BUILD-UP DETAIL (2)

TABLE OF PROPERTIES FOR PRESTRESSED CONCRETE PILES

Pile Size "D"	Area of Pile Section	I	Weight	Prestressing (5)		
				No.	Initial Prestress Force	Concrete Final Prestress (15% Loss)
	Sq In	In 4	Lb/Ft		Kips	psi
16"	254	5,340	265	8	231	774
18"	322	8,600	336	10	289	763
20"	398	13,150	415	14	405	864
24"	574	27,380	598	18	520	770

(1) Locate strands symmetrically about the axis of the pile, with no more than one strand difference between any two adjacent sides.

(2) Provide Class S concrete (f'c = 4,000 psi) for pile build-ups.

(3) Use typical pile embedment details unless shown otherwise elsewhere in the plans. Payment for piles will be in accordance with the details shown. Strip back piling and extend prestressing strands into substructure when piling conflicts with substructure reinforcing or when the side cover from pile edge to substructure edge is less than 4" after driving.

(4) When stripped back piles are required, strip back piling after driving or cast short with strands protruding from top of piling as shown.

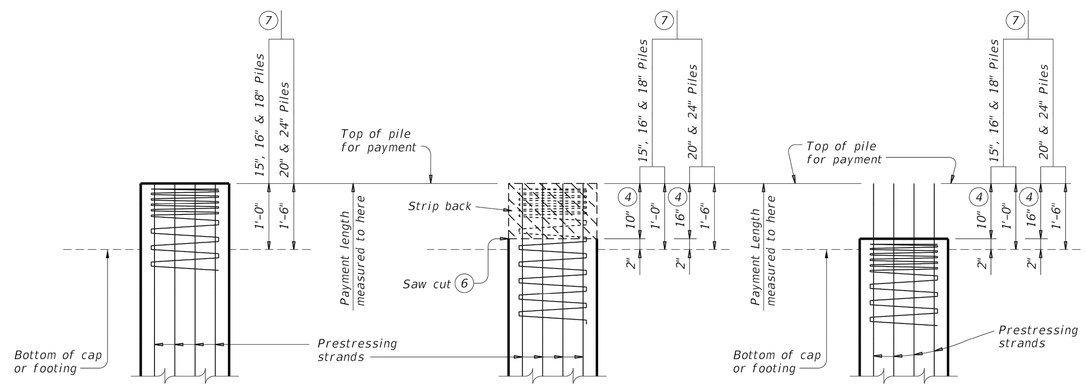
(5) Provide ½" 270 ksi low relaxation strands tensioned to 28.9 kips each. If an optional design is used, provide a minimum concrete final prestress of 750 psi. Submit optional designs for approval.

(6) Saw cut ½" deep around perimeter of pile at the breakback line.

(7) Unless shown otherwise.

(8) ¾" deformed bar anchors (DBA), electric arc-welded to stinger anchor plate with complete fusion.

(9) Place center of stinger within ½" of center of piling.



TYPICAL PILE EMBEDMENT

PILE STRIPPED BACK AFTER DRIVING

PILE CAST WITH PRESTRESSING STRANDS PROTRUDING

PILE EMBEDMENT DETAILS (3)

FABRICATION NOTES:

Provide Class H concrete. Provide sulfate resistant concrete when required.

Minimum release strength, f'ci = 4,000 psi.

Minimum 28-day strength, f'c = 5,000 psi.

All dimensions relating to prestressing steel are to centers of strands.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064.

GENERAL NOTES:

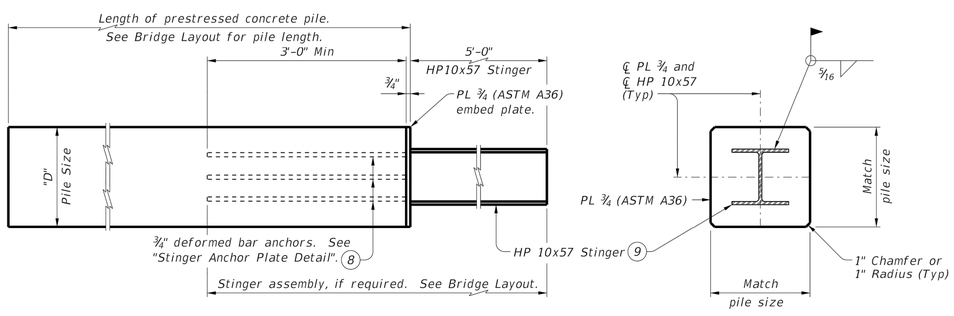
See Bridge Layout for size, number, and length of piling.

See Bridge Layout or elsewhere in the plans for stinger assembly requirements. Stinger assembly is subsidiary to the pile.

Shop drawing submittal and approval is not required if fabrication is in accordance with the details shown on this standard.

For treatment of damaged pile and the lifting loops, see the Concrete Repair Manual.

Cover dimensions are clear dimensions, unless noted otherwise.

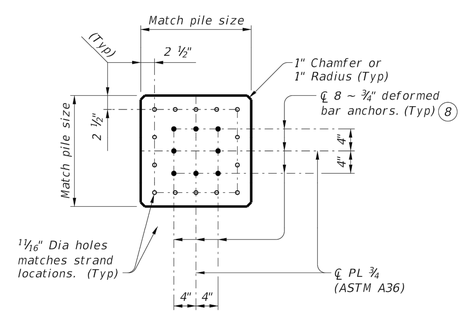


SIDE ELEVATION

STINGER SECTION

TYPICAL PILE AND STINGER ASSEMBLY DETAILS

Pile strands, reinforcing, and holes in stinger anchor plate not shown for clarity.



STINGER ANCHOR PLATE DETAIL

Showing stinger anchor plate for 20" pile, stinger anchor plates for other pile sizes are similar.

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PILING

CP

FILE: cpstde01-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST		COUNTY	SHEET NO.

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DATE:
FILE:

THE STATE OF TEXAS — COUNTY OF GALVESTON

THE STATE OF TEXAS — M. CATHERINE GILLILAND — 90140 — LICENSED PROFESSIONAL ENGINEER

6/3/2019

Huitt-Zollars Inc.
Firm Registration No. F-761

No.	Description	Date
1	FOR BIDDING	6/18/2019

GALVESTON COUNTY
PAUL HOPKINS PARK
PEDESTRIAN BRIDGE

PRESTRESSED CONCRETE PILING

Project number	R308586.01
Date	6/18/2019
Drawn by	CG
Checked by	GW

S7

Scale

NOTE: THIS DRAWING WAS CREATED FOR PRODUCTION ON SHEET SIZE. DO NOT SCALE PRINTS.

THE COUNTY OF GALVESTON

RUFUS G. CROWDER, CPPO, CPPB
PURCHASING AGENT

GWEN MCLAREN, CPPB
ASST. PURCHASING AGENT

COUNTY COURTHOUSE
722 Moody (21st Street)
Fifth (5th) Floor
GALVESTON, TEXAS 77550
(409) 770-5371

August 2, 2019

PROJECT NAME: Paul Hopkins Park Pedestrian Bridge

SOLICITATION NO: B191052

RE: ADDENDUM #2

To All Prospective Bidders:

The following information is being provided to aid in preparation of your bid submittal(s)

Question #1: ***Plans show a Doug Fir or SYP deck, Specs have an IPE Deck.***

Response: Decking, rub rail and toe rail on bridge shall be 0.4 pcf alkaline copper quaternary (ACQ) treated, select structural fir (Fb=1,400 psi minimum) or southern yellow pine (Fb=1,300 psi minimum). Sized per plans and specification.

Question #2: ***Plans show a 90 psf live load. Specs have a 65 psf.***

Response: The bridge shall be designed for a live load of 90 psf.

Question #3: ***Plans show a 10,000 lb vehicles. Specs have a 5,000 lb vehicle.***

Response: The bridge shall be designed for a 10,000 lb vehicle load.

Question #4: ***Plans show Horizontal Rails. Specs call out a Vertical Picket system.***

Response: Horizontal safety rails shall be placed on the inside structure on both sides the bridge up to a minimum height of 42″ above the deck surface. Safety rails shall be placed so as to prevent a 4″ sphere from passing through the rails. Safety rails shall be 1-1/4″ x 1-1/4″ x 1/8″ angle.

Question #5: ***Plans show an H-section Bridge. Specs call out an Underhung Bridge.***

Response: Bridge shall be an H-section Bridge

Question #6: ***Plans call out a ½" min. wall. Specs call out a 3/16" wall.***

Response: Minimum wall thickness shall be ½".

Question #7: ***The bridge is within 10 miles of the coast is weathering steel the finish you want on the bridge.***

Response: Yes, the minimum corrosion index per ASTM D101 shall be 6.0.

Question #8: ***Does Buy America Apply?***

Response: There is no Buy America requirement for this contract.

Question #9: ***What are the means and methods of removal of bridge?***

Response: The means and methods for the work are the responsibility of the contractor.

Question #10: ***Is there a Parks and Wildlife concern?***

Response: No

Question #11: ***Is there a wetland delineation?***

Response: No

Question #12: ***Is the project tax exempt?***

Response: Yes

Question #13: ***There are more trees that will be required to be moved than what is on the plan. Can you please determine a better number of trees and provide which ones need to be removed?***

Response: Drawing C4 has been revised to include this information. (See Attachment A)

Question #14: ***Will permits be required from the City of Dickinson for this project?***

Response: City of Dickinson does not require permits or fees for work in this County Park.

Question#15: ***If we damage the sidewalk, will we have to replace it?***

Response: Yes. Damages caused by the contractor shall be repaired at no cost to the County.

Question#16: ***Can we remove and reinstall the park benches if needed?***

Response: Drawing C4 has been revised to include this information.

Question #17: ***Is payment for pier cut off by the foot like a TXDOT project?***

Response: Pier cut off work is not being paid by the foot. Refer to bid sheet.

Question #5: ***The wage scale included in the bid documents is for Construction Type: Building. This is not building work, and this work is typically classified as Construction Type: Heavy. Will the county consider or accept the Construction Type: Heavy wage scale based on the nature of the work?***

Response: Yes. The wage decision for Construction Type: Heavy is attached. (See Attachment B)

As a reminder, all questions regarding this bridge must be submitted in writing to:

Rufus G. Crowder, CPPO CPPB
Galveston County Purchasing Agent
722 Moody, Fifth (5th) Floor
Galveston, Texas 77550
E-mail: purchasing.bids@co.galveston.tx.us

If you have any further questions regarding this bid, please address them to Rufus Crowder, CPPO CPPB, Purchasing Agent, via e-mail at purchasing.bids@co.galveston.tx.us, or contact the Purchasing Department at (409) 770-5371.

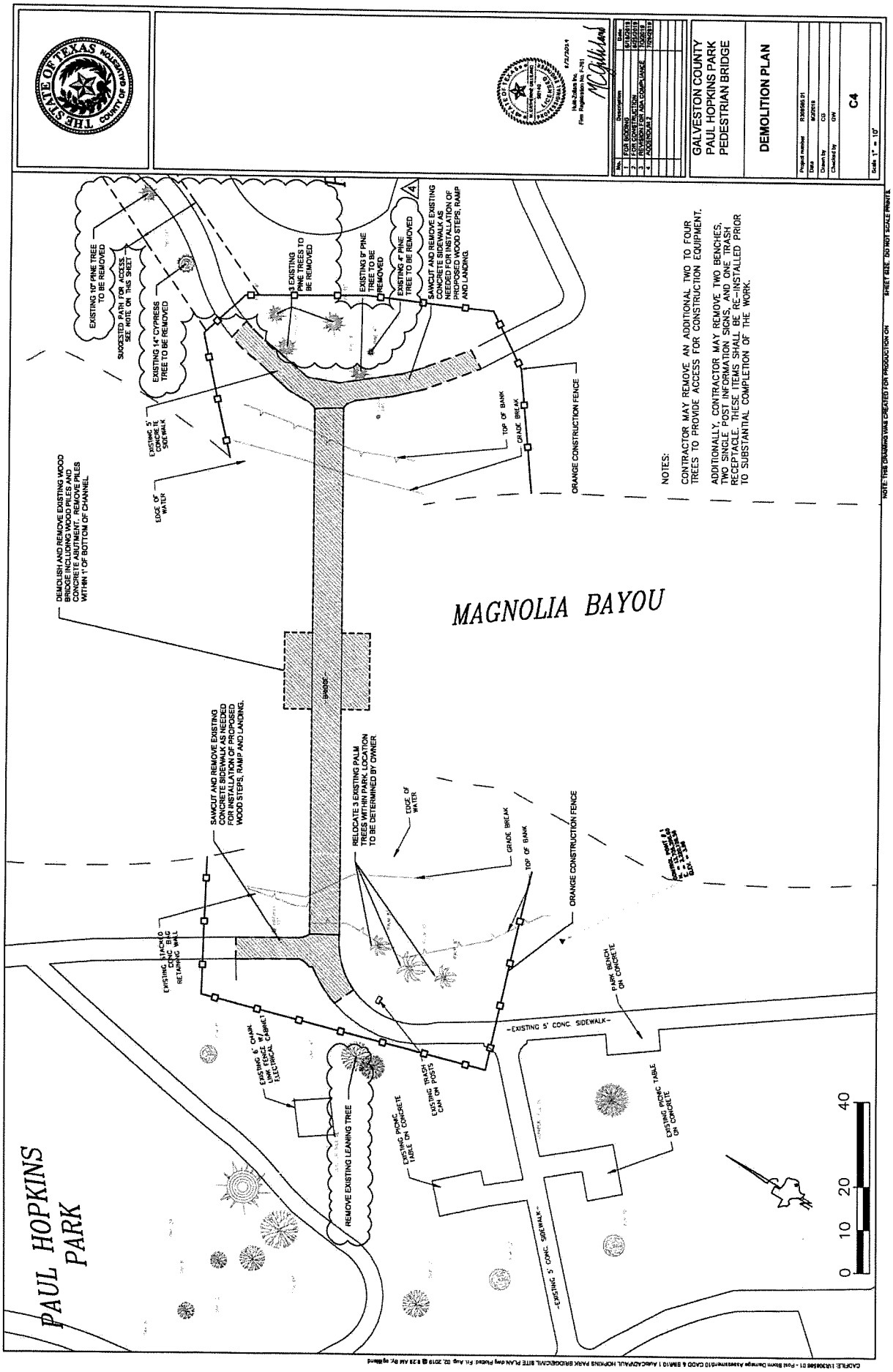
Please excuse us for any inconvenience that this may have caused.

Sincerely,

Rufus Crowder

Rufus G. Crowder, CPPO CPPB
Purchasing Agent
Galveston County

ATTACHMENT A



ATTACHMENT B

"General Decision Number: TX20190046 01/04/2019

Superseded General Decision Number: TX20180067

State: Texas

Construction Type: Heavy

Counties: Brazoria, Fort Bend, Galveston, Harris, Matagorda, Montgomery, Waller and Wharton Counties in Texas.

FLOOD CONTROL PROJECTS ONLY, (Does not Include any Water & Sewer Line work; Sewage Collection and Disposal Lines; Sewers (Sanitary Storm, etc.), or Shoreline Maintenance Water Mains and Water Supply Lines).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.60 for calendar year 2019 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.60 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2019. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate, if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number Publication Date
0 01/04/2019

SUTX1998-009 03/26/1998

	Rates	Fringes
ASPHALT DISTRIBUTOR	$ 9.47	
Asphalt Paving Machine	$ 10.05	
Asphalt Raker	$ 8.28	
Asphalt Shoveler	$ 7.45	
Batching Plant Weigher	$ 11.11	
Broom or Sweeper Operator	$ 8.01	
Bulldozer	$ 9.91	
CARPENTER	$ 10.35	
Concrete Curbing Mach	$ 8.80	
Concrete Finisher-Paving	$ 9.87	
Concrete Finisher-Structures	$ 9.86	
Concrete Finishing Machine	$ 11.79	
Concrete Joint Sealer	$ 10.50	
Concrete Paving Float	$ 9.30	
Concrete Paving Saw	$ 10.01	
Concrete Paving Spreader	$ 9.32	
Concrete Rubber	$ 9.00	
Crane, Clamshell, Backhoe,		

Derrick, Dragline, Shovel.....$ 11.35

Crusher or Screening Plant
Operator.....$ 11.00

ELECTRICIAN.....$ 16.15

Flagger.....$ 7.25

Form Builder (Structures).....$ 9.96

Form Liner - Paving & Curb.....$ 9.03

Form Setter (PAVING/CURB).....$ 8.86

Form Setter-Structures.....$ 9.05

Foundation Drill Operator,
Crawler Mounted.....$ 12.59

Foundation Drill Operator,
Truck Mounted.....$ 12.73

Front End Loader.....$ 9.29

Labor Common.....$ 7.45

Laborer-Utility.....$ 8.53

Lineperson.....$ 7.50

MANHOLE BUILDER (Brick).....$ 8.49

MECHANIC.....$ 11.38

Milling Machine Operator.....$ 10.43

Mixer.....$ 7.94

Motor Grader
FINE GRADE.....$ 11.11
Other.....$ 10.67

Oiler.....$ 9.56

Painter-Structures.....$ 14.00

Pavement Marking Machine.....$ 7.45

Piledriver.....$ 10.96

Pipe layer.....$ 8.49

Reinforcing Steel Setter
Paving.....$ 12.50

Reinforcing Steel Setter
Structures.....$ 12.47

Roller, Pneumatic, Self
Propelled.....$ 7.96

Roller, Steel Wheel Other
Flatwheel or Tamping.....$ 7.61

Roller, Steel Wheel Plant Mix
Pavements.....$ 9.25

Scraper.....$ 8.69

Servicer.....$ 9.51

SIGN ERECTOR.....$ 10.06

Sign Installer.....$ 7.45

Slipform Machine Operator.....$ 9.20

Spreader Box Operator.....$ 9.08

Steelworker Structural.....$ 10.35

Tractor-Crawler Type.....$ 10.12

Tractor-Pneumatic.....$ 8.99

Traveling Mixer.....$ 9.35

Trenching Machine, Heavy.....$ 13.56

Trenching Machine, Light.....$ 10.50

Truck Driver Lowboy Float.....$ 11.29

Truck Driver Single Axle Heavy...$ 8.76

Truck Driver Single Axle,
Light.....$ 8.15

Truck Driver Tandem Axle
Semi-Trailer.....$ 8.00

Wagon Drill, Boring Machine.....$ 10.15

WELDER.....$ 10.43

Work Zone Barricade.....$ 7.45

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
for Federal Contractors applies to all contracts subject to the
Davis-Bacon Act for which the contract is awarded (and any
solicitation was issued) on or after January 1, 2017. If this
contract is covered by the EO, the contractor must provide
employees with 1 hour of paid sick leave for every 30 hours
they work, up to 56 hours of paid sick leave each year.
Employees must be permitted to use paid sick leave for their
own illness, injury or other health-related needs, including
preventive care; to assist a family member (or person who is
like family to the employee) who is ill, injured, or has other
health-related needs, including preventive care; or for reasons
resulting from, or to assist a family member (or person who is
like family to the employee) who is a victim of, domestic
violence, sexual assault, or stalking. Additional information
on contractor requirements and worker protections under the EO
is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the

wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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