Texas General Land Office

Community Development & Revitalization Program

Environmental Review Record for:

City of Richwood

Project Title/ERR Description

Richwood - Flood and Drainage - 24-065-013-E170
(Drainage, Street and Water Improvements)

GLO#: 24-065-013-E170 / B-18-DP-48-0002

Type of Review: EA

Prepared by: Cave Consulting, Inc.

Date: *2024*

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FONSI

COMBINED NOTICE OF FINDING OF NO SIGNIFICANT IMPACT
AND INTENT TO REQUEST RELEASE OF FUNDS

Date of Notice Posting: *July 18, 2024*

Project Name: Richwood - Flood and Drainage - 24-065-013-E170
State/Local Identifier: 24-065-013-E170 / B-18-DP-48-0002

Contact:
City of Richwood City Hall
1800 Brazosport Blvd N
Richwood, TX 77531
972-265-2082
kgarcia@richwoodtx.gov

These notices shall satisfy two separate but related procedural requirements for activities to be undertaken by the **City of Richwood**

REQUEST FOR RELEASE OF FUNDS
On or about **August 7, 2024** the City of Richwood**,** will submit a request to the General Land Office (GLO) for the release of Community Development Block Grant Mitigation (CDBG-MIT) funds appropriated under the Supplemental Appropriations for Disaster Relief Requirements Act, 2018 (Pub. L. 115-123), as amended to undertake a project known as **Richwood - Flood and Drainage - 24-065-013-E170** for the purpose of **providing infrastructure improvements to an area of the City which experiences frequent localized flooding and has inadequate streets and water service.**

Project Location:
All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements
- Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30’ south of Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. from Quail Run Dr. to Magnolia Ln.
- 4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements
- ROW from point 115’ northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
- Briarcreek St. from Magnolia Ln . to Qual Run Dr.
- Quail Run Dr. from Oyster Creek Dr. east 1,230’ (29.06615, -95.41464)
- 4 Oaks St from Briar Creek St. east 622 ‘ (29.06705, -95.41465)
- ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116’ (29.06827, -95.4151)
- ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).

- ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
- ROW from point 14' northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. from point 40' northeast of 4 Oaks St. southwest 465' to point 100' northeast of Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. from Briarcreek St. east 622' (29.06705, -95.41465)
- Quail Run Dr. from point 260' east of Briarcreek St.(29.06613, -95.41673) east 650' (29.06615, -95.41464)
- ROW from point 260' east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).
- ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617, -95.41519)

Street Improvements

- Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
- Brian Creek St from 290' south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475'

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]:
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

Project forecast cost $2,456,500.00 and will be paid for with $2,456,500.00 in HUD CDBG-MIT grant funds administered by the General Land Office.

Project Issues: Coastal Zone Management, Floodplain Management, Historic Preservation and Wetlands Protection: A full, detailed list of mitigation measures can be found in the Environmental Review Record.

Project size: Approximately 3.84 acres.

FINDING OF NO SIGNIFICANT IMPACT

The City of Richwood has determined that the project will have no significant impact on the human environment. Therefore, an Environmental Impact Statement under the National Environmental Policy Act of 1969 (NEPA) is not required. Additional project information is contained in the Environmental Review Record (ERR) on file at the **City of Richwood City Hall, 1800 Brazosport Blvd N, Richwood, TX** and may be examined or copied weekdays 9 A.M to 4 P.M.

PUBLIC COMMENTS

Any individual, group, or agency may submit written comments on the ERR to the **City of Richwood City Hall, 1800 Brazosport Blvd N, and Richwood, TX 77531 and** kgarcia@richwoodtx.gov**.** All comments received by **August 6, 2024** or within eighteen (18) days following this posting (whichever is later) will be considered by the City of Richwood prior to authorizing submission of a request for release of funds. Comments should specify which part of this Notice they are addressing.

ENVIRONMENTAL CERTIFICATION

The City of Richwood certifies to GLO that **Michael Durham,** in their capacity as **Mayor,** consents to accept the jurisdiction of the Federal Courts if an action is brought to enforce responsibilities in relation to the environmental review process and that these responsibilities have been satisfied. GLO's approval of the certification satisfies its responsibilities under NEPA and related laws and authorities and allows the City of Richwood to use Program funds.

OBJECTIONS TO RELEASE OF FUNDS

GLO will accept objections to its release of funds and the City of Richwood**'s** certification for a period of fifteen days following the anticipated submission date or its actual receipt of the request (whichever is later) only if they are on one of the following bases: (a) the certification was not executed by the Certifying Officer of the City of Richwood; (b) the City of Richwood has omitted a step or failed to make a decision or finding required by HUD regulations at 24 CFR part 58; (c) the grant recipient or other participants in the development process have committed funds, incurred costs or undertaken activities not authorized by 24 CFR Part 58 before approval of a release of funds by GLO; or (d) another Federal agency acting pursuant to 40 CFR Part 1504 has submitted a written finding that the project is unsatisfactory from the standpoint of environmental quality. Objections must be prepared and submitted in accordance with the required procedures (24 CFR Part 58, Sec. 58.76) and shall be addressed to Heather Lagrone, Texas General Land Office, PO Box 12873, Austin, TX 78711-2873, env.reviews@recovery.texas.gov. Potential objectors should contact GLO to verify the actual last day of the objection period.

Michael Durham, Mayor

Todd Cave <todd@caveconsulting.com>

Richwood - Flood and Drainage - 24-065-013-E170

1 message

Todd Cave <todd@texasenvironmentals.com> Mon, Jul 15, 2024 at 11:02 AM
To: houston.robert@epa.gov

Robert,

Attached is the FONSI which will be posted for the above project.

Please let me know if you have any questions.

Thanks,

Todd Cave, President
(214) 307-4161
texasenvironmentals.com

Cave Consulting
HUD Environmental Specialists of Texas

Beaumont - 24-067-001-E186-Laura Addition Drainage Improvements_fonsi - Google Docs.pdf
136K

Checklists

Environmental Assessment
Determinations and Compliance Findings for HUD-assisted Projects
24 CFR Part 58

Project Information

Project Name: Richwood - Flood and Drainage - 24-065-013-E170

Responsible Entity: City of Richwood

Grant Recipient (if different than Responsible Entity):

State/Local Identifier: 24-065-013-E170 / B-18-DP-48-0002

Preparer: Todd Cave, Cave Consulting, Inc.

Certifying Officer Name and Title: Michael Durham, Mayor

Grant Recipient (if different than Responsible Entity):

Consultant (if applicable): Public Management, Inc.

Direct Comments to:
City of Richwood City Hall
1800 Brazosport Blvd N
Richwood, TX 77531
972-265-2082
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Construction activities include:

- 8,500 square yards (SY) of 6-inch reinforced concrete pavement with concrete curb and gutter
- 9,200 SY of reworking base course material at an 8-inch minimum thickness
- 395 tons of lime stabilization of base material at an 8-inch minimum thickness
- 1,320 SY of 6-inch reinforced concrete driveway pavement
- 1,900 linear feet (LF) of storm sewer
- 15 curb inlets and storm sewer structures
- 4,100 LF of water main
- 48 water service lines
- Six fire hydrants
- Traffic control

Federal Involvement: HUD

State Involvement:
The project occurs on land or property owned by a political subdivision of the State of Texas: Name of Owner: City of Richwood.

Ground Disturbance:
This project involves ground-disturbing activities: 3.84 acres with a maximum excavation depth of 10 feet anticipated.

Previous Land Use:
The ROW and infrastructure to be improved have been in place for years.

Historic Properties: Structures:
The project area or area of potential effects does not include buildings, structures, or designed landscape features (such as parks or cemeteries) that are 45 years of age or older.

The project area or area of potential effects is not within or adjacent to a property or district that is listed in or eligible for listing in the National Register of Historic Places.

There are no buildings, structures, and/or landscape features within the project area or area of potential effect that are 45 years of age or older.

Statement of Purpose and Need for the Proposal [40 CFR 1508.9(b)]:
The purpose of the proposed project is to provide infrastructure improvements to an area of the City which experiences frequent localized flooding and has inadequate streets and water service.

Existing Conditions and Trends [24 CFR 58.40(a)]:
Currently, the existing concrete streets are in poor condition and are inundated up to 3 feet during intense rain events. Adjacent to the existing concrete streets are aged water mains. The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

The proposed improvements are not expected to affect population growth.

Funding Information

Grant Number	HUD Program	Funding Amount	Local Funds	Total
24-065-013-E170 / B-18-DP-48-0002	CDBG-MIT	$2,456,500.00	-0-	$2,456,500.00

Estimated Total HUD Funded Amount: $2,456,500.00

Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:**

Project forecast cost $2,456,500.00 and will be paid for with $2,456,500.00 in HUD CDBG-MIT grant funds administered by the General Land Office.

Compliance with 24 CFR 50.4, 58.5, and 58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes No ☐ X	According to Google Maps and a Military Bases Map the project is not within 2,500 feet of a civilian airport or within 15,000 feet of a military airport. No impact/effect anticipated and review is in compliance with 24 CFR Part 51 Subpart D. (see Airport Hazards)
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes No ☐ X	According to the GLO Coastal Barrier Map, the project is not located within a coastal barrier area. No impact/effect anticipated and review is in compliance with the Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]. (See Coastal Barriers)

Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes No ☐ X	According to FFSST, based on the user-defined location, service life (36 Years), and non-critical designation, the proposed action is in the FFRMS floodplain.: See Floodplain Management According to the FEMA Community Status Book Report, the City of Richwood is participating in the National Flood Insurance Program. Further, flood insurance is not required for this project. No impact/effect anticipated and review is in compliance with the Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a] . (See Flood Insurance and Floodplain Management)

STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes No ☐ X	According to the EPA Texas County Nonattainment/Maintenance Status, Brazoria County is considered a Non-Attainment area for 1-hour and 8-hour ozone. However, the project conforms to the Finding on Air Quality General Conformity Review Summary Projects which was issued on 9/22/23 No impact/effect anticipated and review is in compliance with the Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93. (See Clean Air)
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes No ☐ X	According to the GLO Coastal Zone Map, the City of Richwood is located within a Coastal Management Zone. According to the GLO, it has been determined that it will likely not have adverse impacts on coastal natural resource areas (CNRAs) in the coastal zone. However, siting and construction should avoid and minimize impacts to CNRAs. If a U.S. Army Corps of Engineers permit is required, it will be subject to consistency review under the Texas Coastal Management Program. No impact/effect anticipated and review is in compliance with the Coastal Zone Management Act, sections 307(c) & (d). (See Coastal Zone Management)

Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No X	Onsite observation revealed no visual evidence of potential contaminated soil nor the presence of hazardous facilities which could be a source of potential soil contamination. After searching the following state/federal databases, no potential sources of contamination which could pose a hazard or would restrict the intended uses of the property or to the occupants were identified: State Databases: ● Industrial and Hazardous Waste (IHW); ● Petroleum Storage Tanks (PST); ● Leaking Petroleum Storage Tanks (LPST); ● Brownfield Site Assessments (BSA); ● State superfund (SF); ● Municipal Solid Waste Landfill Sites (MSWLF); and ● Radio Active Materials ● Superfund ● Voluntary Cleanup ● Closed and Abandoned Landfill Inventory (County). Federal (NEPA Assist Databases): ● National Priorities List (NPL); ● Resource Conservation and Recovery Act – Corrective Action (RCRAC); ● Resource Conservation and Recovery Act – Generator (RCRAG); ● Brownfield Management System (BF); ● Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) ● EPA - Cleanup Sites

		No impact/effect anticipated and review is in compliance with 24 CFR Part 50.3(i) & 58.5(i)(2). (See Contamination and Toxic Substances)
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes No ☐ X	On-site inspection, review of the TPWD County Species List and consultation with the USFWS and TPWD revealed the following: USFWS: <u>Endangered Species:</u> There are a total of eleven (11) threatened, endangered or candidate species that may occur or could potentially be affected by activities in the general project area: ● Tricolored Bat (Perimyotis subflavus) ● Eastern Black Rail Laterallus jamaicensis ssp. jamaice ● Piping Plover *(Charadrius melodus)* ● Red Knot *(Calidris canutus rufa)* ● Whooping Crane *(Grus americana)* ● *Green Sea Turtle Chelonia mydas* ● *Hawksbill Sea Turtle Eretmochelys imbricata* ● *Kemp's Ridley Sea Turtle Lepidochelys kempii* ● *Leatherback Sea Turtle Dermochelys coriacea* ● *Loggerhead Sea Turtle Caretta caretta* ● Monarch Butterfly *(Danaus plexippus)* After review of the habitat requirements, it was determined that no habitat is present as all work will occur within the developed part of the City which is frequently disturbed.

		Critical Habitat: None exists. Wildlife Refuges and Fish Hatcheries: None exist. Wetlands in the National Wetlands Inventory: According to the Wetlands/Waters of the U.S. Delineation Report completed for this project, no wetlands are located within the project area. Migratory Birds The habitat for no migratory birds exists in the project area as all work will occur within the developed part of the City which is frequently disturbed. The proposed project would have "no effect" on federally listed species or critical habitat and no impact on state-listed species. Review is in compliance with the Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402. (See Endangered Species)

Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes No ☐ X	According to the HUD Checklist on Explosive and Flammable Hazard, because the proposed HUD-assisted project does not include a hazardous facility (a facility that mainly stores, handles or processes flammable or combustible chemicals such as bulk fuel storage facilities and refineries) and does not include any of the following activities: development, construction, rehabilitation that will increase residential densities, or conversion, there will be ipact to Explosive and Flammable Hazards. Moreover, according to HUD, 24 CFR Part 51 Subpart C refers to habitable structures and does not apply to temporary workers. Therefore, this project is in compliance with 24 CFR 51 C. No impact/effect anticipated and review is in compliance with 24 CFR Part 51 Subpart C. (See Explosive and Flammable Hazards)
Farmlands Protection Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658	Yes No ☐ X	According to the HUD Checklist on Farmlands Protect, because the project does not include activities that could convert agricultural land to non-agricultural land, there will be no impact/effect anticipated and review is in compliance with the Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658. (See Farmlands Protection)

Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes No X ☐	According to FEMA floodplain map #48039C0610K (Effective Date 12/30/20), the project is located in FEMA Zone AE (100-year floodplain). According to FFSST, based on the user-defined location, service life (36 Years), and non-critical designation, the proposed action is in the FFRMS floodplain. The 2050 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88. The 2060 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88. The North American Vertical Datum of 1988 (NAVD88) is the datum used on FEMA Digital Flood Insurance Rate Maps (DFIRMs) for Base Flood Elevations (BFEs). Projects located in the FFRMS floodplain should be designed consistent with the applicable policies and directives of the agency taking or approving the action. The area of disturbance: 3.84 acres.

		Exemptions to Part 55: Actions listed in the revised 24 CFR 55.12 that are exempt from the floodplain management requirements of Part 55 include: ● Exempt activities and actions that are Categorically Excluded Not Subject to 50.4 or 58.5 ● Restoration or preservation of floodplains, acquisition of floodplains property provided the site is used for flood control or open space but only if structures are cleared and improvements are specifically limited ● Receivership or foreclosure and related actions ● Policy-level actions not involving site-based work ● Issuance of non-project-based housing vouchers ● A minor amendment to a previously approved action <u>The project is subject to Part 55 because it meets the criteria for none of the exemptions,</u>

		Critical Actions: Critical action means any activity for which even a slight chance of flooding would be too great because such flooding might result in loss of life, injury to persons, or damage to property. Critical actions include activities that create, maintain, or extend the useful life of those structures or facilities that: ● Produce, use, or store highly volatile, flammable, explosive, toxic, or water-reactive materials ● Provide essential and irreplaceable records or utility or emergency services that may become lost or inoperative during flood and storm events (e.g., community stormwater management infrastructure, water treatment plants, data storage centers, generating plants, principal utility lines, emergency operations centers including fire and police stations, and roadways providing sole egress from flood-prone areas) ● Are likely to contain occupants who may not be sufficiently mobile to avoid loss of life or injury during flood or storm events, e.g., persons who reside in hospitals, nursing homes, convalescent homes, intermediate care facilities, board and care facilities, and retirement service centers; housing for independent living for the elderly is not considered a critical action Because the project meets none of the above criteria, it is not considered a critical action.

		Mitigation Requirements: CFR 55.20 (e)(1): For actions in the FFRMS floodplain, the required elevation described in this section must be documented on an Elevation Certificate or a Floodproofing Certificate in the Environmental Review Record prior to construction, or by such other means as HUD may from time to time direct, provided that notwithstanding any language to the contrary, the minimum elevation or floodproofing requirement for new construction or substantial improvement actions shall be the elevation of the FFRMS floodplain as defined in this section. Non-Critical Actions ● CFR 55.7(d)(1): The FFRMS floodplain includes those areas that result from adding an additional two feet to the base flood elevation based on best available information. Critical Actions CFR 55.7(d)(2): ● The FFRMS floodplain includes those areas that result from adding an additional three feet to the base flood elevation based on best available information. Applicable Projects According to the HUD Exchange on Floodplain Management (Complying with 24 CFR Part 55 (2)), if a project involves new construction or substantial improvement, elevation requirements apply.

		Substantial Improvement: A substantial improvement is any repair, reconstruction, modernization or improvement of a structure, including one of the following: ● The cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or, if the structure has been damaged and is being restored, before the damage occurred ● That results in an increase of more than 20 percent in the number of dwelling units in a residential project or in the average peak number of customers and employees likely to be on-site at any one time for a commercial or industrial project Certain types of projects are specifically not considered substantial improvement under Part 55. ● Any project solely for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications that is solely necessary to assure safe living conditions ● Any alteration of a structure listed on the National Register of Historical Places or on a State Inventory of Historic Places ● Structural repairs, reconstruction, or improvements not meeting the definition for substantial improvement are considered "minor improvements." Because this project is not considered a structure, <u>elevation requirements do not apply.</u>

		The 8-step process was followed and alternatives were considered: 1. Do only work outside the 100-year floodplain. - The infrastructure to be addressed is located within 100-year floodplains and must be addressed. (Not Viable) 2. Obtain a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR). - It was determined that neither a LOMA nor a LOMR was likely nor practical for the project area. (Not Viable) 3. Other infrastructure considered. - After considering other potential projects in the City, it was determined that of the eligible projects, this project was of the highest priority. (Not Viable) 4. No Action or Alternative Actions that Serve the Same Purpose. - The infrastructure to be addressed is inadequate for the area and must be addressed to prevent public health hazards. (Not Viable) No comments were received. It was determined that there are no practical alternatives to the project as proposed.

		The following mitigation measures will be incorporated. 1. Preserving Property: Project designs should, to the best extent possible, incorporate measures to reduce the risk of damage to the new infrastructure via another flood. 2. Preserving Natural Values and Minimizing Impacts: After construction is completed, the disturbed area will need to be immediately re-vegetated with native grasses. Only native plants are to be used in the floodplain and on the site. 3. Deposition and excavation of materials will need to be performed in such a manner that erosion and sedimentation will be controlled. 4. Precautions will need to be taken in the handling of fuels or other hazardous materials to prevent discharge or spillage resulting in lower groundwater quality. 5. Erosion control measures such as hay bales or silt screen barriers will need to be implemented and maintained during construction as required. 6. The project engineer will need to incorporate best management practices into the specifications and plans. No impact/effect anticipated and review is in compliance with Executive Order 11988, particularly section 2(a); 24 CFR Part 55. (See Floodplain Management)

Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800	Yes No ☐ X	According to the Texas Historical Commission: Above-Ground Resources No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties. Archeology Comments No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains. According to the HUD Tribal Directory Assessment Tool, there are five (5) tribes with an interest in the County. Comment letters were sent out on February 29, 2024. No comments were received. No impact/effect is anticipated and review is in compliance with the National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800. (See Historical Preservation)

Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B	Yes No ☐ X	According to the HUD Checklist on Noise, because the project does not involve a noise-sensitive use such as a residential structure, school, hospital, nursing home, library, etc, there will be no impacts to noise abatement and control. During construction, noise may increase which could bother local residents. Negative impacts are expected to be minimal as all work will be performed during working hours. No impact/effect anticipated and review is in compliance with the Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978; 24 CFR Part 51 Subpart B. (See Noise Abatement and Control)
Sole Source Aquifers Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149	Yes No ☐ X	According to the EPA Sole Source Aquifer Map, the project is not near a sole source aquifer. No impact/effect anticipated and review is in compliance with the Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149. (See Sole Source Aquifers)

Wetlands Protection Executive Order 11990, particularly sections 2 and 5	Yes No X ☐	According to the Wetlands/Waters of the U.S. Delineation Report completed for this project, the following was concluded: The proposed project activities include drainage improvements to install and replace the storm sewer system and water main lines at various locations within a residential subdivision in the City of Richwood. The project will improve the existing drainage by conveying it through an underground storm sewer system and outfall to an existing concrete-lined drainage ditch along the eastern boundary of the subdivision. The proposed outfall is designed to tie-in to the existing drainage ditch above the OHWM of the ditch. <u>No wetlands are located within the project area.</u> One potentially jurisdictional intermittent stream (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) are located within the project area. Ditch 1 is an intermittent stream (tributary to Bastrop Bayou) located along the eastern boundary of the review area. Ditch 1 is considered a non-navigable RPW that originates approximately 920 feet south of the review area from stormwater outfall from the adjoining subdivisions and flows 0.40-mile north to its outfall to Bastrop Bayou, a TNW. Since Ditch 1 exhibits a relatively permanent flow of water and has a direct and continuous surface water connection to a downstream TNW, it is CEC's opinion that Ditch 1 would likely be considered a jurisdictional tributary to Bastrop Bayou and regulated under Section 404 of the CWA.

		Ditch 2 is a man-made stormwater drainage ditch that extends in a north to south alignment and is wholly contained within the subdivision, west of Ditch 1. Ditch 2 originates from a stormwater outfall pipe south of the intersection of Audubon Woods Drive and Briarcreek Street and terminates within a dry bottom retention basin near the southern end of the review area. Since Ditch 2 is a man-made stormwater drainage ditch and has no direct and continuous surface water connection to a downstream TNW, it is CEC's opinion that Ditch 2 would not be considered a WOTUS and would not be regulated under Section 404 of the CWA. Provided the proposed stormwater outfall from the new storm sewer system will be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and there is no fill material placed below the OHWM of the channel, no Section 404 permit will be required for the project. Should the project design change, impacts to WOTUS should be re-evaluated to determine whether a Section 404 permit is required. To help prevent runoff into the WOTUS, a Storm Water Pollution Prevention plan will be in place. No impact/effect is anticipated and review is in compliance with Executive Order 11990, particularly sections 2 and 5. (See Wetlands Protection)

Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes ☐ No X	According to the Texas Wild and Scenic and Inventory Rivers map, the project is not within a one (1) mile proximity of a designated Wild, Scenic River; Study River or a river segment that potentially qualifies as a national wild, scenic or recreational river area. No impact/effect is anticipated and review is in compliance with the Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c). (See Wild and Scenic Rivers)
Environmental Justice Executive Order 12898	Yes ☐ No X	According to the HUD Checklist on Environmental Justice, because no adverse environmental impacts were identified in any other compliance review portion of this project's total environmental review and all work will occur within existing ROW, there will be no impact/effect anticipated and review is in compliance with Executive Order 12898. (See Environmental Justice)

Environmental Assessment Factors [24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27] Recorded below is the qualitative and quantitative significance of the effects of the proposal on the character, features and resources of the project area. Each factor has been evaluated and documented, as appropriate and in proportion to its relevance to the proposed action. Verifiable source documentation has been provided and described in support of each determination, as appropriate. Credible, traceable and supportive source documentation for each authority has been provided. Where applicable, the necessary reviews or consultations have been completed and applicable permits of approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate. **All conditions, attenuation or mitigation measures have been clearly identified.**

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.

(1) Minor beneficial impact
(2) No impact anticipated
(3) Minor Adverse Impact – May require mitigation
(4) Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	Review of Google Maps and onsite photos indicated that the project is in conformance with local development plans and no special permit or change in zoning will be required as the project involves improvements to existing infrastructure which is already in conformance with local plans. All work will occur within existing ROW or easements. The project is in compliance with surrounding land uses and there will be no change in land use. The project does not constitute an activity that would contribute to urban sprawl. There will be no long-term impact of the project on the visual character of its surroundings and ultimately, on the residents, users and/or visitors of the project.

Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	1	According to the National Seismic Hazard map, the project area is in a low-hazard area. The project will not be affected by a high water table as construction activities will occur well above the water line. No unusual soil conditions were identified during an onsite review of the project area and there was no visible evidence of soil problems or filled ground. No soil studies have been conducted. However, the project engineer has determined that the soil is suitable for the project and unsuitable soil conditions are not expected to affect the project. The project will occur within a residential area of the City and within existing ROW and will not change any land uses. Therefore, the project will not significantly affect soils that may be better suited for natural resource management activities such as farming, forestry, unique natural area preservation, etc. Onsite observations and review of on-site photos revealed some steep slopes into a drainage channel but the majority of the project area is relatively flat. There was no visual indication of previous slides or slumps in the project area, such as tilted trees or fences, that would affect this project. Therefore the project will significantly affect or be affected by slope conditions. Onsite observations and review of on-site photos revealed no evidence of erosion and/or sedimentation in the general project area. Because the project may involve site clearance, the removal of soil and some native grasses, which could contribute to soil erosion, will likely occur. No erosion or sedimentation is expected to result from this project and erosion controls will be installed. Further, to help prevent runoff into the WOTUS, a Storm Water Pollution Prevention plan will be in place.

		Based upon on-site observation, there was no indication of cross-lot runoff, swales or drainage flows. There were also no indications of filled ground, active rills or gullies at the sites. The project will have a positive impact on stormwater disposal and treatment by improving the conveyance of stormwater in the area. There is public storm sewer available in the project area and streets, bar ditches and culverts are also utilized to control stormwater runoff. The project itself will not cause or substantially contribute to off-site pollution by stormwater run-off, leaching of chemicals, or other pollutants nor will it significantly affect or be affected by drainage and stormwater conditions as standard BMP's will be utilized.
Hazards and Nuisances including Site Safety and Noise	3	On-site observations, review of onsite photos and aerial photos revealed that the project will not be affected by natural hazards, but will be affected by man-made hazards during construction: (Dangerous Roadway and Above and Below Ground Utilities). No unusual conditions were found at the site and review of state and federal hazmat databases indicated that the site has not been used as a dump, sanitary landfill or mine waste disposal area. There was no indication of contaminated soil or, fill/vent pipes, pipelines and there are no air pollution generators which would adversely affect the site. Drainage structures were identified but no negative imipacts are anticipated from these structures. The project will not be affected by any nuisances and do not constitute a place where people will live, study or work. The project itself is not a noise-generating facility in a noise-sensitive area. Therefore, no such facility will be affected by this project.

		During construction, noise levels will be temporarily increased which could disturb residents in the area. Potential negative impacts of Hazards and Nuisances including Site Safety will be reduced as state-mandated dig tests will be performed as necessary and traffic controls will be included in the construction documents as necessary.
Energy Consumption	3	The project does not involve constructing an energy-using activity. However, during construction, energy consumption is expected to slightly increase, but should not significantly impact existing supplies.

Environmental Assessment Factor	Impact Code	Impact Evaluation
SOCIOECONOMIC		
Employment and Income Patterns	1	The project will result in no changes in employment and income patterns, will not significantly increase or decrease employment opportunities and will create conditions favorable to commercial, industrial or institutional operation or development by helping ensure reduced localized flooding in the area as well as adequate driving surfaces and water service.
Demographic Character Changes, Displacement	2	After reviewing project area photos, it was concluded that the project will not have a measurable effect on the demographic character of the area, will not severely alter residential, commercial or industrial uses and will not destroy or harm any community institution, such as a church. The proposed will not cause the relocation or displacement of any residence or business or adversely affect planned development, businesses, residences, or neighborhoods near the project area.

Environmental Assessment Factor	Impact Code	Impact Evaluation
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	3	Based upon review of on-site and aerial photos, the project will not directly serve or be affected by school facilities and according to Google Maps there are two (2) Elementary schools within close proximity to the project area. The project does not involve a housing development and will not directly serve a cultural facility. Therefore, adequate access to cultural facilities, as it pertains to housing, does not apply. During construction, vital utilities such as electric, water, sewer and internet could be damaged which could interrupt school operations. In addition, children could enter the construction zone and get injured and school traffic could be negatively impacted by potential detours. Since state-mandated dig tests will be performed prior to construction and appropriate and site safety and traffic controls will be included in the construction documents, the potential for such damage will be minimized. As a result of the project, localized flooding is anticipated to be reduced during high rains which will help ensure school traffic and operations can safely continue during these periods.

Commercial Facilities	3	The project includes roadway improvements which will not directly affect or be affected by commercial facilities and, according to Google Maps, a few commercial facilities exist near the project area. During construction, vital utilities such as electric, water, sewer and internet could be damaged and therefore interrupt commercial operations. Since state-mandated dig tests will be performed prior to construction as necessary, the potential for such damage will be minimized.
Health Care and Social Services	2	Based upon review of onsite photos and Google Maps, the project includes street system improvements which will not directly affect or be affected by health care or social services facilities and there are no such facilities in the project area. Therefore, there will be no impacts to health care and social services facilities.
Solid Waste Disposal / Recycling	2	Based upon review of onsite photos and Google Maps, the project will not directly serve a solid waste facility and there are no such facilities in the project area. In addition, the project does not involve a housing or commercial development. Therefore, consideration of adequate solid waste disposal/recycling, as it pertains to these activities, does not apply. It is anticipated that waste associated with the project will be generated during construction. The contractor will be responsible for disposing of the waste in accordance to state laws, including those pertaining to hazardous materials. Due to the small amount of waste anticipated to be produced, existing landfill capacities in the area are expected to be adequate.

Waste Water / Sanitary Sewers	3	The project does not involve a housing or commercial development. Therefore, consideration of adequate sewer service, as it pertains to these activities, does not apply. During construction, existing sewer lines could be damaged, which could interrupt service and/or result in raw sewage spills which could pose a health risk to the community. Potential negative impacts to sewer facilities will be reduced as required dig tests will be conducted as necessary. As a result of this project, localized flooding will be reduced which could reduce infiltration/inflow into the wastewater system and/or raw sewage spills which could result in inefficient/effective treatment of sewage as well as a health hazard to the community.
Water Supply	3	The project does not involve a housing or commercial development and will not directly serve a public safety facility. Therefore, water supply, as it pertains to these activities, does not apply. During construction, existing water lines could be damaged, which could interrupt service which could pose a health risk to the community. Potential negative impacts to water facilities will be reduced as required dig tests will be conducted. As a result of this project, some aged and dilapidated water lines will be replaced and localized flooding will be reduced which could reduce infiltration into the water system which could contaminate the water supply and present a health hazard to water customers.

Public Safety - Police, Fire and Emergency Medical	3	The project does not involve a housing or commercial development and will not directly serve a public safety facility. Therefore, adequate police, fire and emergency medical access, as it pertains to these activities, does not apply. Review of onsite-photos and Google Maps indicated a Municipal Court is located within ½ mile of the project area.

		During construction, vital utilities such as electric, water, sewer and internet could be damaged and therefore interrupt Public Safety operations and emergency vehicle movement could be negatively impacted by potential detours. Since state-mandated dig tests will be performed prior to construction as necessary and appropriate traffic controls will be incorporated into construction contracts, the potential for such damage will be minimized. As a result of the project, localized flooding is anticipated to be reduced during high rains which will help ensure emergency vehicle movement can continue during these periods.
Parks, Open Space and Recreation	3	The project does not involve a housing development. Therefore, adequate access to parks, open space and recreation, as it pertains to housing, does not apply. According to on-site inspection, Google Maps and review of project area photographs, a small community park is located within ½ mile of the project area. As such, during construction, children could enter the construction area and get injured. Potential negative impacts to children will be reduced as site safety requirements will be included in construction documents.

Transportation and Accessibility	3	The project does not involve a housing or commercial development. Therefore, adequate access to transportation facilities and parking, as it pertains to these activities, does not apply. During construction, traffic could be negatively impacted by potential detours. Impacts should be minimized as appropriate traffic controls will be incorporated into construction contracts. As a result of the project, some dilapidated streets will be reconstructed and localized flooding is anticipated to be reduced which will help ensure vehicle safe movement is available to the residents in the area.

Environmental Assessment Factor	Impact Code	Impact Evaluation
NATURAL FEATURES		
Unique Natural Features, Water Resources	2	Review of Google Maps and onsite photos indicated that there are no natural features (bluffs or cliffs) or public or private scenic areas near the project site. According to the EPA Sole Source Aquifer Map, the project is not near a sole source aquifer.
Vegetation, Wildlife	3	The project will not create problems by introducing nuisance or non-indigenous species of vegetation that may be ecologically disruptive, be invasive, threaten survival of indigenous plant habitats, or disrupt agricultural or silvicultural activities as only native plants will be used. The project will not damage or destroy existing remnant or endemic plant communities, especially those containing nationally, regionally or locally rare species (e.g., prairie grasslands, ice-age disjuncts, local soil-type endemics, etc.) as none exist in the project area. The project will not damage or destroy plant species that are legally protected by state or local ordinances as none exist in the project area. There is a potential that the project will damage or destroy trees in the project area as construction activities may include removing branches and or trees within the project area. However, impacts are expected to be minimal as few trees appear to be in the anticipated construction zone. The project will create special hazards for animal life as ground soil, native grasses and small trees which serve as habitat for some species, may be removed during construction. However, the disturbance is expected to be minimal and most affected animal life should be able to relocate on adjacent properties. The project will not impact migratory birds as their habitat does not exist in the project area.

		The project site does not host species that are monitored or listed by local, state, tribal or the federal government. The project will not damage or destroy existing wildlife habitats (e.g., removal or blockage of wildlife corridors, such as a riparian buffer) as none exist in the project area. The project will not include excessive grading that will alter the groundwater level and thus cause death of trees and ground cover which in turn diminishes animal habitat as no such grading is included in this project. The project will not damage game fish habitat or spawning grounds as none exist in the project area. During construction, storm drainage in the project area could be disrupted. However, any disruption is expected to be minimal as drainage controls will be incorporated into the construction contract where needed. The project will not create conditions favorable to the proliferation of pest species as it is anticipated that only native plants/soils will be utilized in the project as native grasses and landscaping will be utilized. The project will not create conditions (e.g., generate excessive noise or introduce pesticide usage) that could harm or harass wildlife species that are nationally, regionally or locally rare or protected by state or local ordinance as none exist in the project area.
Other Factors		None Identified.

Field Inspection (Date and completed by)**:**
7/24/23 - Miriam Morman - Public Management, Inc.

Additional Studies Performed:

- Wetland/Waters of the U.S. Delineation Report - 6/25/24

List of Sources, Agencies and Persons Consulted [40 CFR 1508.9(b)]**:**

Sources:

- US Census
- Google Maps
- Aerial Photos
- Onsite Observation
- NPIAS Website
- Map of U.S. Military Bases
- General Land Office Coastal Barrier Map
- FEMA Community Status Book Report
- NEPA Assist
- Closed and Abandoned Landfills - Regional COG
- TCEQ - CQR
- General Land Office Coastal Zone Map
- USFWS IPAC Report and Official Species List
- TPWD County Species List
- FFSST
- FEMA floodplain map
- HUD Tribal Directory
- EPA Sole Source Aquifer Map
- USFWS Wetland Mapper
- Texas Wild and Scenic and Inventory Maps
- National Seismic Hazard Map

Agencies:

- GLO - 2/10/24
- USFWS - 3/27/24
- Texas Historical Commission - 1/11/24
- Apache Tribe of Oklahoma - 2/29/24
- Comanche Nation, Oklahoma - 2/29/24
- Coushatta Tribe of Louisiana - 2/29/24
- Tonkawa Tribe of Indians of Oklahoma - 2/29/24
- Wichita and Affiliated Tribes - (Wichita, Keechi, Waco & Tawakonie), Oklahoma - 2/29/24

List of Permits Obtained: None

Public Outreach [24 CFR 50.23 & 58.43]**:**
The public was given the following opportunities to comment:

- During Application Process
- 8-Step Process
- During FONSI comment period

Cumulative Impact Analysis [24 CFR 58.32]**:**

Project Size and Beneficiaries
The total area of disturbance will be 3.84 acres and will impact 201 persons. Of these persons, 121, or 60.20%, are of low to moderate income.

Alternatives [24 CFR 58.40(e); 40 CFR 1508.9]

BUILD

1. **Other infrastructure considered. -** After considering other potential projects in the City, it was determined that of the eligible projects, this project was of the highest priority. (Not Viable)

2. **No Action or Alternative Actions that Serve the Same Purpose**. - The infrastructure to be addressed is inadequate for the area and must be addressed to prevent public health hazards. (Not Viable)

BUILD/PROPOSED

3. **Construct the project as proposed.** The City has determined that the project, as proposed, is the best solution to the potential public health issues as adequate funding is in place and engineering plans and environmental studies are underway. (viable)

No Action Alternative [24 CFR 58.40(e)]:

4. **A no-action alternative was considered.** The infrastructure in this project is currently not functioning properly and could pose a health hazard to the community if not addressed. (Not Viable)

Summary of Findings and Conclusions:

Resource Study Area

Based on a review of the performance statement in the grant contract with GLO, the relevant resource study area (RSA) is the City of Richwood and the area served by the infrastructure to be improved with this project.

The Context

The project will occur within a developed part of the City within residential neighborhoods and all work will occur within the existing ROW. The area to benefit is served by infrastructure owned and operated by the City.

With this project, the City will help reduce localized flooding in the area which will help ensure safer vehicular movement during periods of high rains as potentially improve EMS response times and reduce potential property damage caused by flooding waters. The project will also reconstruct dilapidated streets and replaced old water line which will help ensure safe vehicular movement and adequate water service in the area.

With the aid of federal grant funds, the City has been able to upgrade other infrastructure in the City. In addition, planning studies have been commissioned which will help the City better allocate their funds for such projects.

Cumulative Effects

Cumulative Effects are defined as environmental effects that are greater in magnitude, extent, or duration than the direct and indirect effects of a proposed action when combined with the effects of other current and future actions, regardless of the proponent.

Using a trends method to analyze the cumulative effects on the resources over time along with consultation with federal, state authorities, the City and the project engineer, the effect or cumulative stresses were determined for the RSA.

As part of this analysis, the following other projects within the same geographic scope were considered:

- None

Other cumulative impacts which were considered include:

- Street Damage
- Water Wastewater Contamination
- Water Contamination
- Increased Property Values
- Community Growth
- Vehicle Damage
- Fire Protection

Because the project will provide better-localized flooding protection for residents in the target area, it is anticipated that localized flooding will be less likely to occur. As a result:

- On-going street maintenance may be reduced.
- Potential contamination of the water system may be reduced.
- Potential wastewater system treatment disruption and raw sewage spills may be reduced.
- Reducing localized flooding on sreets and property will help maintain or increase property vaulues and increase the chances of future residential and commerical growth in the area.
- Vehicular damage caused by inadequate roadways may be reduced.
- The water system improvements will help ensure proper fire project can be provided to the area.

No other cumulative impacts are expected to occur from the Proposed Action in combination with actions occurring near the project area.

Foreseeable Actions
It has been determined that addressing the infrastructure improvements in the project area will occur.

Conclusion
Inadequate storm drainage, streets and water line are creating a health risk to residents and must be addressed.

Multiple alternatives were considered and rejected as not being viable. Mitigation measures will be put into place to minimize potential negative impacts to the environment.

Based on available environmental documents, consultation with the project engineer, and other information collected about these actions, it was determined that there will be no adverse effects to the environment resulting from this project if appropriate mitigation measures are undertaken.

Mitigation Measures and Conditions [40 CFR 1505.2(c)]

Summarize below all mitigation measures adopted by the Responsible Entity to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with the above-listed authorities and factors. These measures/conditions must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures should be clearly identified in the mitigation plan.

Law, Authority, or Factor	Mitigation Measure
Coastal Zone Management	● If a U.S. Army Corps of Engineers permit is required, it will be subject to consistency review under the Texas Coastal Management Program.
Floodplain Management	● Preserving Property: Project designs should, to the best extent possible, incorporate measures to reduce the risk of damage to the new infrastructure via a flood. ● Preserving Natural Values and Minimizing Impacts: After construction is completed, the disturbed area will need to be immediately re-vegetated with native grasses. Only native plants are to be used in the floodplain and on the site. ● Deposition and excavation of materials will need to be performed in such a manner that erosion and sedimentation will be controlled. ● Precautions will need to be taken in the handling of fuels or other hazardous materials to prevent discharge or spillage resulting in lower groundwater quality. ● Erosion control measures such as hay bales or silt screen barriers will need to be implemented and maintained during construction as required. ● The project engineer will need to incorporate best management practices into the specifications and plans.

Historic Preservation	● Above-Ground Resources: If historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties. ● Archeology Comments: If cultural materials are encountered during project activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
Wetlands Protection	● The proposed stormwater outfall from the new storm sewer system must be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and no fill material should be placed below the OHWM of the channel. If these conditions can not be met, a Section 404 permit may be required. Therefore, should the project design change, impacts to WOTUS should be re-evaluated to determine whether a Section 404 permit is required.

The Mayor and Staff will assure that this plan, as modified and described above, is executed and necessary language will be included in all agreements with participating parties. These parties will also take an active role in monitoring the construction process to ensure no unnecessary impacts occur nor unnecessary risks are taken.

Determination:

X **Finding of No Significant Impact** [24 CFR 58.40(g)(1); 40 CFR 1508.27]
The project will not result in a significant impact on the quality of the human environment.

☐ **Finding of Significant Impact** [24 CFR 58.40(g)(2); 40 CFR 1508.27]
The project may significantly affect the quality of the human environment.

Preparer Signature:  Date: 7/15/2024

Name/Title/Organization: Todd Cave, Cave Consulting, Inc.

Certifying Officer Signature: _____ Date: 7/17/2024

Name/Title: Michael Durham, Mayor

This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

U.S. Department of Housing and Urban Development
451 Seventh Street, SW
Washington, DC 20410
www.hud.gov

espanol.hud.gov

Environmental Review for Activity/Project that is Exempt or Categorically Excluded Not Subject to Section 58.5

Pursuant to 24 CFR Part 58.34(a) and 58.35(b)

Project Information

Project Name: Central Richwood Flood, Drainage, and Water Project

Responsible Entity: City of Richwood

Grant Recipient (if different than Responsible Entity):

State/Local Identifier: HGAC-MIT MOD Application

Preparer: Eric Foerster, City Manager

Certifying Officer Name and Title: Steve Boykin, Mayor

Consultant (if applicable): Public Management, Inc.

Project Location: Quail Run, 4 Oaks Street, and Briarcreek Street, Brazoria County, Texas

Description of the Proposed Project [24 CFR 58.32; 40 CFR 1508.25]:
The City is submitting an application to the CDBG-MIT MOD funding to reconstruct Quail Run, 4 Oaks Street, and Briarcreek Street. The street reconstruction will include the following items of work:

- 7,725 square yards (SY) of 6-inch reinforced concrete pavement with concrete curb and gutter
- 8,505 SY of reworking base course material at an 8-inch minimum thickness
- 370 tons of lime stabilization of base material at an 8-inch minimum thickness
- 2,100 SY of 6-inch reinforced concrete driveway pavement
- 3,000 linear feet (LF) of storm sewer
- 24 curb inlets and storm sewer structures
- 4,100 LF of water main
- 51 water service lines
- Six fire hydrants
- Traffic control

- Site restoration

Currently, the existing concrete streets are in poor condition and are inundated up to 3 feet during intense rain events. Adjacent to the existing concrete streets are aged water mains. The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch.
The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

Level of Environmental Review Determination:

X Activity/Project is Exempt per 24 CFR 58.34(a): **3) Administrative and management activities & (8) Engineering and design costs**

☐ Activity/Project is Categorically Excluded Not Subject To §58.5 per 24 CFR 58.35(b):

Funding Information

Grant Number	HUD Program	Funding Amount
TBD	CDBG-MOD	$2,456,500.00

Estimated Total HUD Funded Amount: $2,456,500.00

This project anticipates the use of funds or assistance from another Federal agency in addition to HUD in the form of (if applicable)**: N/A**

Estimated Total Project Cost (HUD and non-HUD funds) [24 CFR 58.32(d)]**:** $2,456,500.00

Compliance with 24 CFR §50.4 and §58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR 50.4 and 58.6	Are formal compliance steps or	Compliance determinations

	mitigation required?	
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR §58.6		
Airport Runway Clear Zones and Accident Potential Zones 24 CFR Part 51 Subpart D	Yes No ☐ X	*Project does not involve the sale or purchase of existing property.*
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes No ☐ X	*Project is not located in coastal barrier resource area.*
Flood Insurance Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]	Yes No ☐ X	*Project involves formula grants made to states, State-owned property, small loans, assisted leasing that is not used for repairs, improvements, or acquisition. The Project is not located in a Special Flood Hazard Area. This will be re-evaluated as project is fully identified.*

Mitigation Measures and Conditions [40 CFR 1505.2(c)]

Summarize below all mitigation measures adopted by the Responsible Entity to reduce, avoid, or eliminate adverse environmental impacts and to avoid non-compliance or non-conformance with the above-listed authorities and factors. These measures/conditions must be incorporated into project contracts, development agreements, and other relevant documents. The staff responsible for implementing and monitoring mitigation measures should be clearly identified in the mitigation plan.

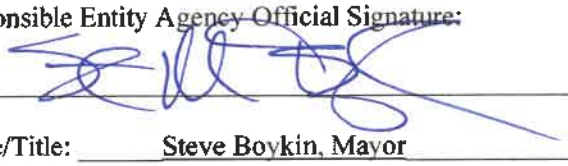
Law, Authority, or Factor	Mitigation Measure
FDPA, FEMA	*Project area will be further evaluated once final location and scope is determined.*

Preparer Signature: C.E. _____ Date: 11-17-2022

Project Name | Project Locality and State | HEROS Number

Name/Title/Organization: Eric Foerster, City Manager

Responsible Entity Agency Official Signature:



Date: 12/17/22

Name/Title: Steve Boykin, Mayor

This original, signed document and related supporting material must be retained on file by the Responsible Entity in an Environmental Review Record (ERR) for the activity/project (ref: 24 CFR Part 58.38) and in accordance with recordkeeping requirements for the HUD program(s).

Project Information

Description and Budget

GLO CONTRACT NO. 24-065-013-E170
COMMUNITY DEVELOPMENT BLOCK GRANT
MITIGATION PROGRAM – REGIONAL MITIGATION PROGRAM PROJECTS
NON-RESEARCH & DEVELOPMENT
MITIGATION FUNDING

The **GENERAL LAND OFFICE** (the "GLO"), a Texas state agency, and **CITY OF RICHWOOD**, Texas Identification Number (TIN) **17417105495** ("Subrecipient"), each a "Party" and collectively the "Parties," enter into this Subrecipient agreement (the "Contract") under the U.S. Department of Housing and Urban Development's Community Development Block Grant Mitigation ("CDBG-MIT") program to provide financial assistance with funds appropriated under the Further Additional Supplemental Appropriations for Disaster Relief Requirements Act, 2018 (Public Law 115-123), enacted on February 9, 2018, for necessary expenses for Activities authorized under Title I of the Housing and Community Development Act of 1974 (42 U.S.C. § 5301 et seq.) related to disaster relief, long-term recovery, restoration of infrastructure and housing, economic revitalization, mitigation, and affirmatively furthering fair housing, in accordance with Executive Order 12892, in the most impacted and distressed areas resulting from major declared disasters that occurred in 2015, 2016, or 2017 pursuant to the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. § 5121 et seq.).

Through CDBG-MIT Federal Award Number B-18-DP-48-0002, awarded January 12, 2021, as may be amended from time to time, the GLO administers grant funds as Community Development Block Grants (Catalog of Federal Domestic Assistance Number 14.228, "Community Development Block Grants/State's program and Non-Entitlement Grants in Hawaii"), as approved by the Texas Land Commissioner and limited to use for facilitating recovery efforts in Presidentially-declared major disaster areas.

ARTICLE I - GENERAL PROVISIONS

1.01 SCOPE OF PROJECT AND SUBAWARD

(a) **Scope of Project**

The purpose of this Contract is to set forth the terms and conditions of Subrecipient's participation in the CDBG-MIT program. In strict conformance with the terms and conditions of this Contract, Subrecipient shall perform, or cause to be performed, the Activities defined in **Attachment A** (the "Project"). Subrecipient shall conduct the Project in strict accordance with this Contract, including all Contract Documents listed in **Section 1.02**, below, and any Amendments, Revisions, or Technical Guidance Letters issued by the GLO.

CITY OF RICHWOOD

24-065-013-E170

PERFORMANCE STATEMENT

The GLO awards City of Richwood (Subrecipient) this Contract under HUD's Community Development Block Grant Mitigation (CDBG-MIT) program to provide financial assistance with funds appropriated to facilitate Activities related to disaster relief, long-term recovery, restoration of infrastructure and housing, economic revitalization, mitigation, and affirmatively furthering fair housing, in accordance with Executive Order 12892, in the most impacted and distressed areas resulting from a major declared disaster that occurred in 2015, 2016, or 2017.

In strict conformance with the terms and conditions of the CDBG-MIT – Hurricane Harvey HUD MID and pursuant to the GLO's Regional Mitigation Program and this Contract, Subrecipient shall perform, or cause to be performed, the Infrastructure Activities identified below to increase its resilience to disasters and reduce or eliminate long-term risk of disaster-related loss of life, injury, damage to and loss of property, and suffering and hardship by lessening the impact of future disasters.

Subrecipient shall perform the Activities identified herein for the service area specified in its approved Texas Community Development Block Grant Mitigation Grant Application to provide a long-lasting investment that increases resiliency in the community. The persons to benefit from the Activities described herein must receive the prescribed service or benefit, and all eligibility requirements must be met to fulfill contractual obligations.

The grant total is $2,456,500.00. Subrecipient will be required to maintain a detailed Budget breakdown in the official system of record (TIGR) of the GLO's Community Development and Revitalization division. Subrecipient must ensure expenditures for individual projects do not exceed the amounts for detailed funding categories in the project budget of the approved Grant Application, as may be revised in writing upon mutual agreement of the Parties. If it becomes necessary to redistribute Budget line-item amounts between Activities, Subrecipient must seek a Contract Amendment prior to performing any work.

DRGR Activity: MIT - Public Facilities and Improvements-Non-Covered Projects- LMI

Activity Type: Flood and Drainage Improvements

Project Title: Central Richwood Flood and Drainage Project

Subrecipient shall install pavement, curb and gutter, driveways, pipe, curb inlets, and storm sewer inlets; remove and install water main and fire hydrants; perform street reconstruction; and complete associated appurtenances. Construction shall take place at the following locations:

Defining Project Location (on/along…)	Approximate path or location (from…to…Coordinates)	Proposed HUD Performance Measures
Briarcreek Street	From Quail Run Drive to FM 2004 29.06759, -95.41617	1,500 Linear Feet (LF)
4 Oaks Street	From Briarcreek Street to Audubon Woods Drive 29.06699, -95.41582	500 LF
Quail Run Drive	From Oyster Creek Drive to Audubon Woods Drive 29.06615, -95.41704	1,000 LF

Total Beneficiaries	LMI Beneficiaries	LMI %	Census Tract	Block Group
201	121	60.20	6637.00	2
Beneficiaries were identified using Surveys, and the above project meets the LMI national objective.				

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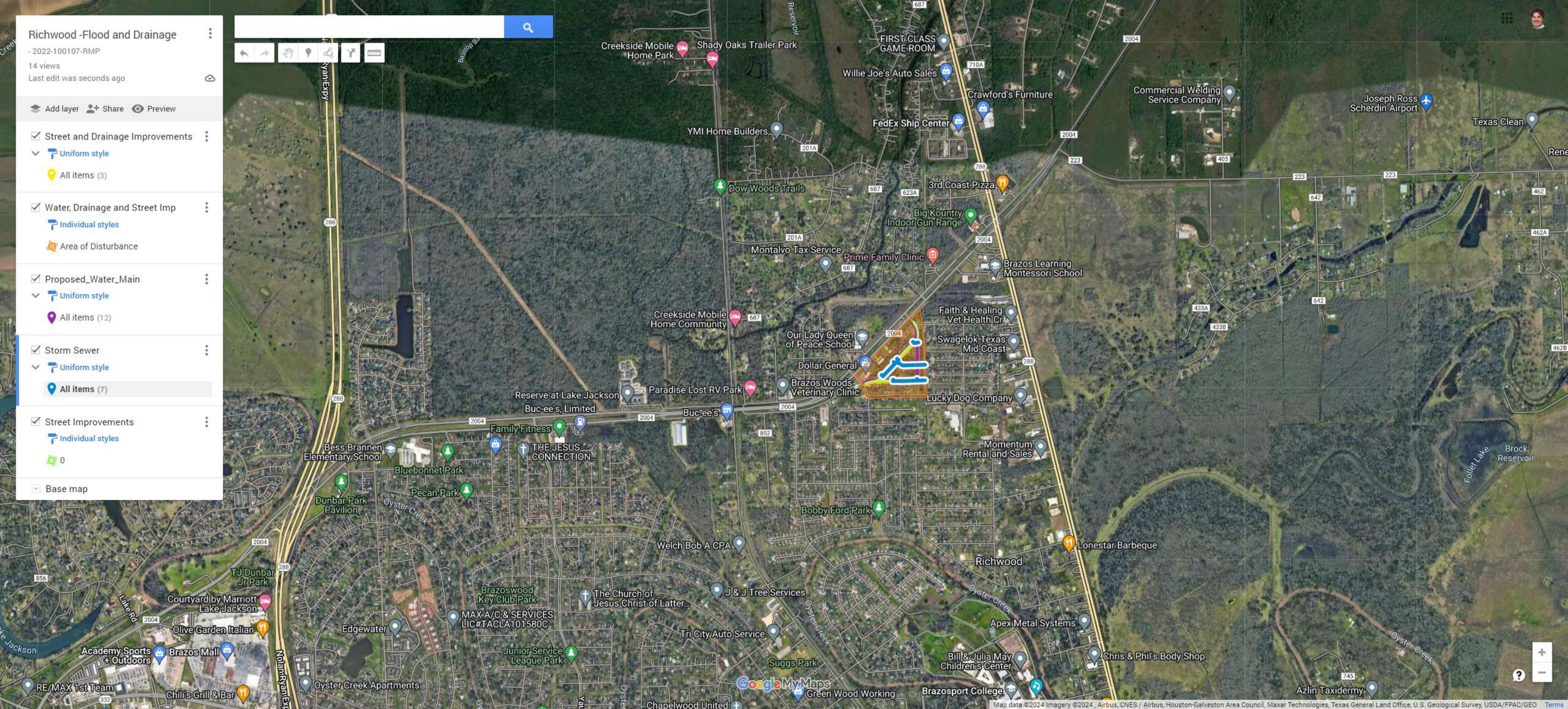
BUDGET

DRGR Activity Type	Grant Award	Other Funds	Total
MIT - Public Facilities and Improvements-Non-Covered Projects- LMI	$2,456,500.00	$0.00	$2,456,500.00
TOTAL	$2,456,500.00	$0.00	$2,456,500.00

BENCHMARKS

	Not-To-Exceed Budget Gate Percentages by Budget Category (Subrecipient may draw up to, but not exceed, the identified percentage of the Budget category until stated Deliverable(s) are submitted to and approved by the GLO.)			**Single Deliverable Milestones by Budget Category** (Subrecipient may draw up to 100% of Budget category after submittal to and approval by the GLO of the stated Deliverable.)		**Multiple Deliverable Milestones** (Subrecipient may draw up to, but not exceed, the percentage stated after submittal to and approval by the GLO of the stated Deliverable.)	
	Project Delivery						
Project Phase Actions and Deliverables	**Grant Administration Funds**	**Environ-mental Funds**	**Engineering Funds**	**Special Environ-mental Funds**	**Acquisition Funds**	**Construction Funds**	**Planning/ Studies (not related to engineering design)**
Action: Start-up Phase **Deliverable:** Contract kick-off meeting sign-in sheet; all required Start-Up Documentation reviewed and accepted by the GLO; executed grant administration service provider contract in PDF format.	0-15%						
Action: Commencement of Engineering Phase **Deliverable:** Executed engineering service provider contract in PDF format provided during start-up phase as applicable			0-30%				

Location Maps / Drawings


Richwood -Flood and Drainage
- 2022-100107-RMP
14 views
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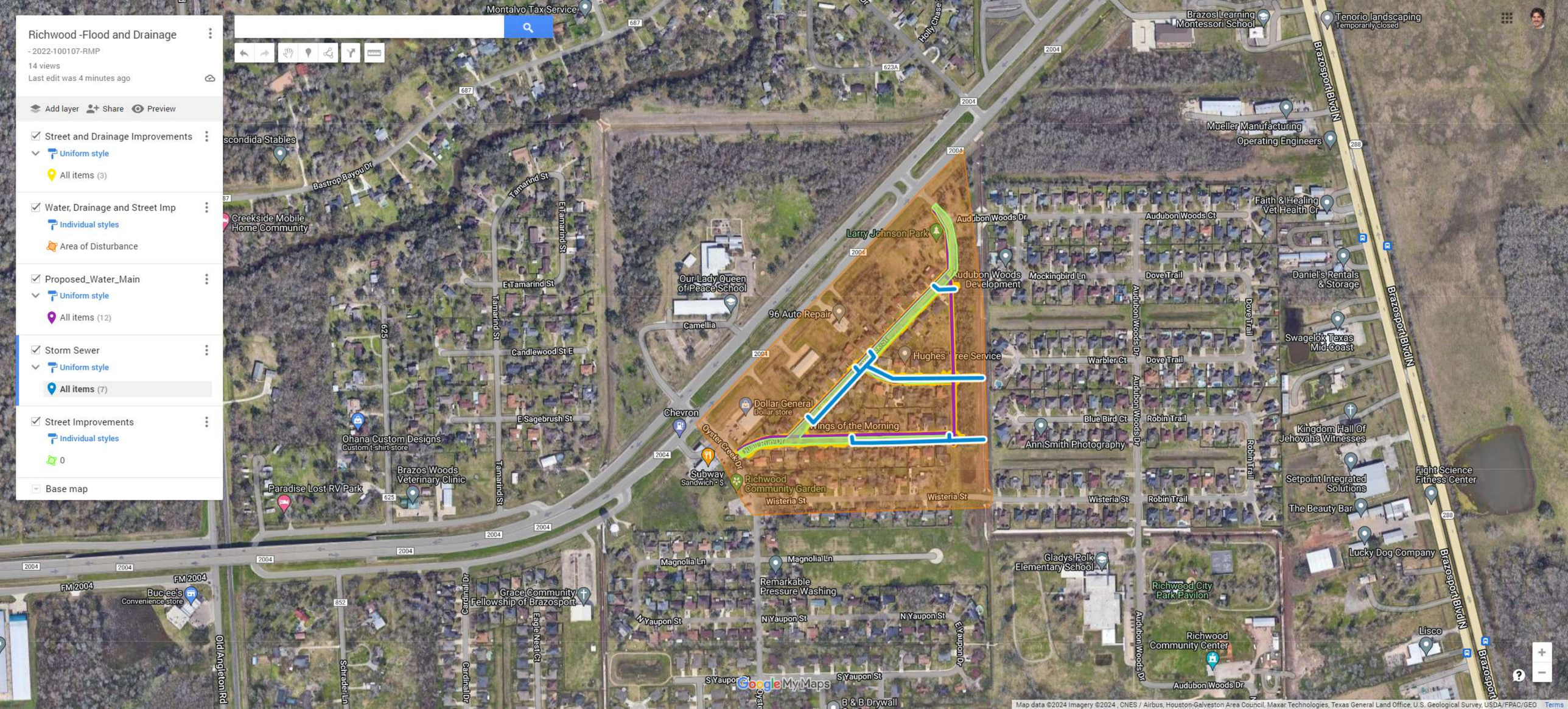
Add layer
Share
Preview
Street and Drainage Improvements
Uniform style
All items (3)
Water, Drainage and Street Imp
Individual styles
Area of Disturbance
Proposed_Water_Main
Uniform style
All items (12)
Storm Sewer
Uniform style
All items (7)
Street Improvements
Individual styles
0
Base map
Creekside Mobile Home Park
Shady Oaks Trailer Park
FIRST CLASS GAME ROOM
Willie Joe's Auto Sales
Crawford's Furniture
Commercial Welding Service Company
Joseph Ross Scherdin Airport
Texas Clean
FedEx Ship Center
YMI Home Builders
Dow Woods Trails
3rd Coast Pizza
Big Kountry Indoor Gun Range
Montalvo Tax Service
Prime Family Clinic
Brazos Learning Montessori School
Creekside Mobile Home Community
Faith & Healing Vet Health Cr
Our Lady Queen of Peace School
Swagelok Texas Mid-Coast
Dollar General
Reserve at Lake Jackson
Paradise Lost RV Park
Brazos Woods Veterinary Clinic
Lucky Dog Company
Buc-ee's, Limited
Buc-ee's
Family Fitness
Bess Brannen Elementary School
THE JESUS CONNECTION...
Momentum Rental and Sales
Bluebonnet Park
Dunbar Park Pavilion
Pecan Park
Oyster Creek
Bobby Ford Park
Welch Bob A CPA
Lonestar Barbeque
Richwood
TJ Dunbar Jr Park
Courtyard by Marriott Lake Jackson
Brazoswood Key Club Park
The Church of Jesus Christ of Latter...
J & J Tree Services
Olive Garden Italian
Edgewater
MAX A/C & SERVICES LIC#TACLA101580C
Tri City Auto Service
Apex Metal Systems
Academy Sports + Outdoors
Brazos Mall
Junior Service League Park
Suggs Park
Bill & Julia May Children's Center
Chris & Phil's Body Shop
RE/MAX 1st Team
Chili's Grill & Bar
Oyster Creek Apartments
Green Wood Working
Brazosport College
Azlin Taxidermy
Follett Lake
Brock Reservoir
Google My Maps
Map data ©2024 Imagery ©2024 , Airbus, CNES / Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO
Terms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Tenorio landscaping
Temporarily closed
Mueller Manufacturing
Operating Engineers
Faith & Healing Vet Health Cr
Daniel's Rentals & Storage
Swagelok Texas Mid-Coast
Kingdom Hall Of Jehovahs Witnesses
Setpoint Integrated Solutions
Fight Science Fitness Center
The Beauty Bar
Lucky Dog Company
Lisco
Richwood Community Center
Richwood City Park Pavilion
Gladys Polk Elementary School
Ann Smith Photography
Audubon Woods Development
Larry Johnson Park
Our Lady Queen of Peace School
Camellia
96 Auto Repair
Hughes' Tree Service
Dollar General
Dollar store
Wings of the Morning
Chevron
Subway
Sandwich's $
Richwood Community Garden
Ohana Custom Designs
Custom t-shirt store
Brazos Woods Veterinary Clinic
Paradise Lost RV Park
Creekside Mobile Home Community
scondida Stables
Grace Community Fellowship of Brazosport
Remarkable Pressure Washing
B & B Drywall
Buc-ee's
Convenience store
Bastrop Bayou Dr
Tamarind St
E Tamarind St
Candlewood St E
E Sagebrush St
Wisteria St
Magnolia Ln
N Yaupon St
S Yaupon St
Audubon Woods Dr
Audubon Woods Ct
Mockingbird Ln
Dove Trail
Warbler Ct
Blue Bird Ct
Robin Trail
Oyster Creek Dr
Old Angleton Rd
Schrader Ln
Cardinal Dr
Eagle Nest Ct
Brazosport Blvd N
FM 2004
Google MyMaps
Map data ©2024 Imagery ©2024 , CNES / Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO
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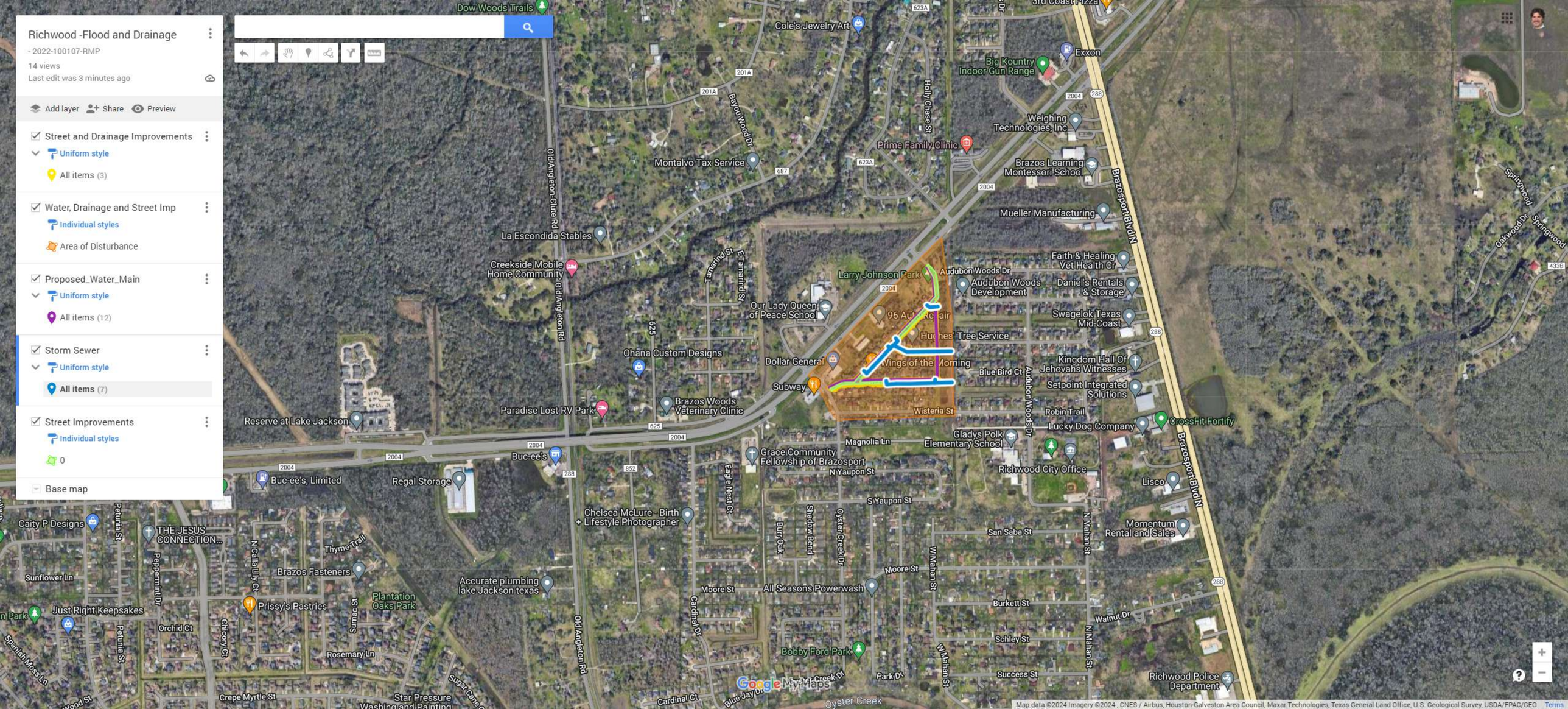
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Blue Bird Ct
Setpoint Integrated Solutions
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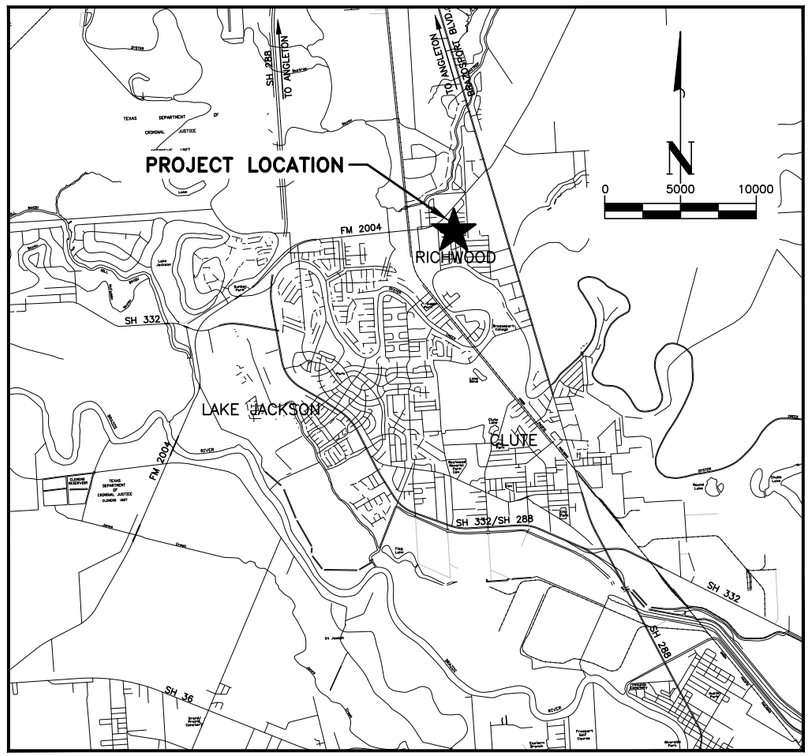
Brazos Woods Veterinary Clinic
Wisteria St
Robin Trail
Reserve at Lake Jackson
Lucky Dog Company
CrossFit Fortify
Gladys Polk Elementary School
Magnolia Ln
Buc-ee's
Grace Community Fellowship of Brazosport
Richwood City Office
Buc-ee's, Limited
Regal Storage
N Yaupon St
Lisco
S Yaupon St
Caity P Designs
Chelsea McLure - Birth + Lifestyle Photographer
Momentum Rental and Sales
San Saba St
THE JESUS CONNECTION...
Thyme Trail
Brazos Fasteners
Sunflower Ln
Accurate plumbing lake Jackson texas
Moore St
All Seasons Powerwash
Just Right Keepsakes
Prissy's Pastries
Plantation Oaks Park
Burkett St
Walnut Dr
Orchid Ct
Rosemary Ln
Schley St
Bobby Ford Park
Success St
Richwood Police Department
Crepe Myrtle St
Star Pressure Washing and Painting
Cardinal Ct
Oyster Creek
Google My Maps
Map data ©2024 Imagery ©2024 , CNES / Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO
Terms

CITY OF RICHWOOD

CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

STRAND JOB NO. 4570.020



VICINITY MAP
SEE BARSCALE

MAYOR:
MICHAEL DURHAM

CITY COUNCIL
POSITION 1 - MIKE JOHNSON
POSITION 2 - MIKE CHALLENGER
POSITION 3 - AMANDA REYNOLDS
POSITION 4 - RODRIGO "RORY" ESCALANTE
POSITION 5 - JEREMY FOUNTAIN

CITY MANAGER:
ERIC FOERSTER

PUBLIC WORKS DIRECTOR:
CLIF CUSTER

STRAND ASSOCIATES®

STRAND ASSOCIATES, INC.
BRENHAM, TEXAS

NO.	REVISIONS	DATE:

TITLE SHEET

CITY OF RICHWOOD
2022 SIDEWALK AND DRAINAGE IMPROVEMENTS

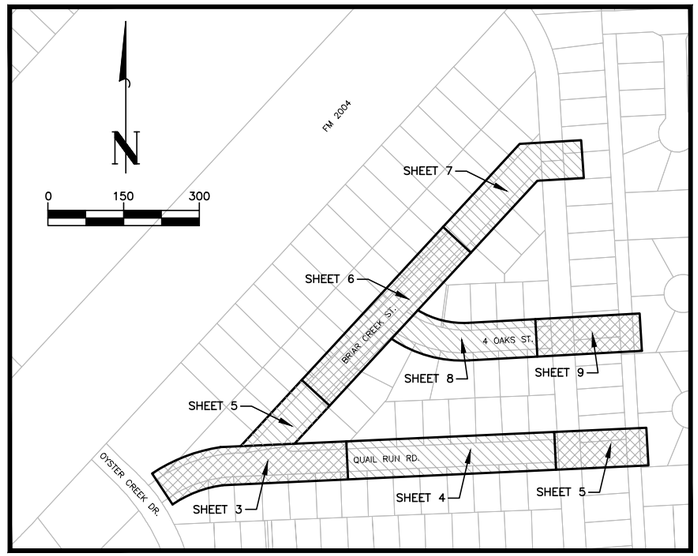
JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405
STRAND ASSOCIATES®
SHEET 1

EXISTING FEATURES LEGEND

SYMBOLS:	DESCRIPTION:	SYMBOLS:	DESCRIPTION:	SYMBOLS:	DESCRIPTION:
	– BOARD FENCE		– CLEANOUT		– SHRUB/BUSH/HEDGES
	– CHAIN LINK FENCE		– FIRE HYDRANT		– STORM SEWER MANHOLE
	– ℄ DITCH		– GUY WIRE		– STREET SIGN
T	– TELEPHONE LINE		– IRON PIPE OR ROD		– TELEPHONE PEDESTAL
OE	– OVERHEAD ELECTRICAL LINE		– MAILBOX		– ASPHALT PAVEMENT
UE	– UNDERGROUND ELECTRICAL LINE		– SEWER MANHOLE		– CONCRETE PAVEMENT
S	– SEWER LINE		– METER POLE OR LIGHT		– TREE (CANOPY NOT MEASURED UNLESS SHOWN OTHERWISE)
W	– WATER LINE		– UTILITY POLE		
	– TOP/TOE OF SLOPE				
FO	– FIBER OPTIC LINE				
	– PROPERTY LINE				
	– BRUSH				
	– WATER METER				
WV	– WATER VALVE				
	– SURVEY CONTROL				
	– TBM BENCHMARK				

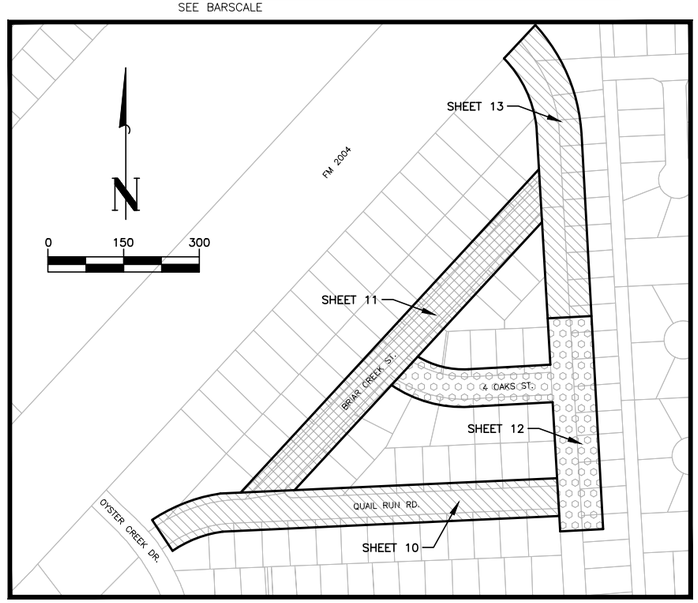
SHEET LIST TABLE

Sheet Number	Sheet Title
1	TITLE SHEET
2	SHEET INDEX, LEGEND, AND PROJECT LOCATION MAP
3	QUAIL RUN P&P 10+00 - 15+50
4	QUAIL RUN P&P 15+50 - 21+00
5	QUAIL RUN P&P 21+00 - 23+08 & BRIAR CREEK P&P 30+00 - 32+50
6	BRIAR CREEK P&P 32+50 - 38+00
7	BRIAR CREEK P&P 38+00 - 42+05
8	FOUR OAKS P&P 50+00 - 54+00
9	FOUR OAKS P&P 54+00 - 56+50
10	QUAIL RUN WATER LINES
11	BRIAR CREEK WATER LINES
12	FOUR OAKS WATER LINES
13	MAGNOLIA LN. WATER LINES
14	WATER DETAILS
15	PAVING DETAILS
16	DRAINAGE DETAILS
17	SINGLE BOX CULVERTS PRECAST
18	SINGLE BOX CULVERTS CAST-IN-PLACE
19	SINGLE BOX CULVERTS CAST-IN-PLACE
20	PRECAST JUNCTION BOX
21	DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX
22	CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY
23	CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY
24	CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY
25	CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY
26	PRECAST CURB INLET OUTSIDE ROADWAY
27	PRECAST CURB INLET OUTSIDE ROADWAY
28	PRECAST AREA ZONE DRAIN
29	PRECAST SLAB LID
30	PRECAST SLAB LID
31	SAFETY END TREATMENT ARCH PIPE
32	SAFETY END TREATMENT ARCH PIPE
33	SAFETY END TREATMENT RCP
34	SAFETY END TREATMENT BOX CULVERT
35	SAFETY END TREATMENT BOX CULVERT
36	PIPE AND BOX GROUTED CONNECTIONS



PAVING AND DRAINAGE SHEET INDEX MAP

SEE BARSCALE



WATER LINE SHEET INDEX MAP

SEE BARSCALE

GENERAL NOTES:

1. IN ADDITION TO THE OTHER NOTIFICATIONS REQUIRED BY THE SPECIFICATIONS AND CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOTIFY THE CITY OF RICHWOOD, AT (979)265–2082, AND STRAND ASSOCIATES, INC., AT (979)836–7937, WHEN THE FOLLOWING PHASES OF CONSTRUCTION ARE ABOUT TO BEGIN:
   (a) 48 HOURS BEFORE ACTUAL WORK BEGINS, AND
   (b) 24 HOURS BEFORE ANY REQUIRED TESTING.

2. CONTRACTOR SHALL HAVE ALL UNDERGROUND UTILITY LINES LOCATED AT LEAST 48 HOURS BEFORE DIGGING.

3. CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY TO PROVIDE FOR TRAFFIC CONTROL IN ACCORDANCE WITH THE LATEST EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. IN THE EVENT OF STREET CLOSURES, CONTRACTOR SHALL NOTIFY ALL EMERGENCY SERVICE PROVIDERS AT LEAST 24 HOURS PRIOR TO CLOSING STREETS TO TRAFFIC.

4. ALL UNDERGROUND UTILITY LINES DEPICTED ON THE PLANS ARE SHOWN FOR THE PURPOSE OF MAKING THE CONTRACTOR AWARE THAT THEY EXIST. NEITHER THE OWNER, NOR THE ENGINEER GUARANTEES THE ACCURACY THEREOF. ALSO, THE LOCATIONS OF SOME EXISTING UTILITY LINES ARE NOT KNOWN AND THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES DURING CONSTRUCTION. THE FINAL ALIGNMENT OF THE PROPOSED LINES ARE SUBJECT TO MODIFICATION PENDING THE ESTABLISHMENT OF THE EXISTING UTILITY LOCATIONS AND THE CONTRACTOR WILL BE COMPENSATED FOR EXTRA PIPE AND FITTINGS AT UNIT PRICE BID BUT NO COMPENSATION WILL BE MADE FOR EXTRA TIME RESULTING FROM THE MODIFICATIONS.

5. ANY PROPERTY BOUNDARY MONUMENTS DISTURBED BY CONTRACTOR SHALL BE REPLACED TO THE ORIGINAL CONDITION BY A REGISTERED PROFESSIONAL LAND SURVEYOR AT CONTRACTOR'S EXPENSE.

6. CONTRACTOR SHALL REPAIR ALL ADJACENT PROPERTY OWNERS' FENCES DISTURBED BY CONSTRUCTION TO A CONDITION EQUAL TO OR BETTER THAN ORIGINAL CONDITION.

7. ANY UNPAVED AREA DISTURBED BY CONTRACTOR SHALL BE GRADED, SHAPED AND SEEDED PER TECHNICAL SPECIFICATION.

8. EROSION CONTROL MEASURES SHALL CONFORM TO ALL STATE AND FEDERAL REQUIREMENTS, AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION OF THE PROJECT.

9. CONTRACTOR SHALL PROVIDE RESIDENTS ACCESS TO THEIR HOMES AFTER WORKING HOURS AND ON WEEKENDS.

10. THE CONTRACTOR SHALL PERFORM ALL CLEARING AND GRUBBING OPERATIONS REQUIRED TO INSTALL THE IMPROVEMENTS COVERED UNDER THIS PROJECT. NO CLEARING OR GRUBBING SHALL TAKE PLACE OUTSIDE ANY EASEMENT OR RIGHT–OF–WAY. TREES WITHIN PERMANENT UTILITY EASEMENTS SHALL BE REMOVED AND DISPOSED OF BY CONTRACTOR UNLESS SHOWN TO BE BORED. CONTRACTOR MAY BORE THESE TREES IN LIEU OF REMOVING THEM AT NO EXTRA COST TO THE OWNER. TREES DESIGNATED TREE TO BE PRESERVED SHALL BE BORED FROM DRIP LINE TO DRIP LINE. CONTACT ENGINEER IF PLANS DO NOT CALL FOR BORING A DESIGNATED TREE TO BE PRESERVED.

11. THE CONTRACTOR SHALL BE AWARE THAT OVERHEAD POWER AND TELEPHONE LINES EXIST WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT MAINTAINS A MINIMUM SAFE CLEARANCE FROM ALL ENERGIZED POWER LINES.

12. THE CONTRACTOR SHALL PROTECT EXISTING YARDS, BOTH PUBLIC AND PRIVATE, DRIVES, CURBS, MAIL BOXES, SIGNS, CULVERTS, ETC. FROM DAMAGE DURING CONSTRUCTION. DAMAGES DONE TO THESE ITEMS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL MOVE AND REINSTALL SUCH MOVABLE OBJECTS AS MAIL BOXES, TRAFFIC CONTROL AND STREET SIGNS AS NECESSARY FOR CONSTRUCTION.

13. THE CONTRACTOR SHALL DISPOSE OF ALL SURPLUS MATERIALS FROM THE PROJECT IN A MANNER ACCEPTABLE TO THE OWNER AND THE ENGINEER AND IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

14. CONTRACTOR SHALL REPAIR ALL PAVEMENT AS DETAILED ON THE PLANS. ALL PAVEMENT REPAIR AND REPLACEMENT SHALL BE EQUAL TO OR BETTER THAN EXISTING PAVEMENT. ALL ASPHALT REPAIR SHALL INCLUDE A MINIMUM OF 1 1/2" OF COMPACTED H.M.A.C. BACKFILL UNDER PAVEMENT SHALL BE AS SHOWN ON THE PLANS. WHERE A LINE IS TO BE INSTALLED UNDERNEATH PAVEMENT, THE PAVEMENT SHALL BE CUT BY SAW OR OTHER APPROVED MEANS BEFORE EXCAVATION. INCLUDE SAWCUT OF PAVEMENT AND BACKFILL IN UNIT PRICE FOR PAVEMENT REPAIR. CONTRACTOR MAY CHOOSE TO BORE ROADS IN LIEU OF OPEN CUTTING. PAYMENT WILL BE MADE BASED ON OPEN CUT PAVEMENT REPAIR.

15. CONTRACTOR SHALL GRADE THE SITE TO THE PROPOSED SPOT ELEVATIONS SHOWN ON THE SITE GRADING PLAN.

16. CONTRACTOR SHALL REMOVE AND STOCKPILE A MINIMUM OF 4" OF TOPSOIL BEFORE GRADING TO THE DESIGN ELEVATIONS. THE FINAL 4 INCHES OF THE GRADING IN AREAS TO REMAIN WITH VEGETATIVE COVER SHALL CONSIST OF TOPSOIL AND BE ROLLED TO A SMOOTH FINISH AND SEEDED.

17. WHERE WATER LINES CROSS UNDER EXISTING CURB AND GUTTER, THERE WILL BE NO SEPARATE PAY FOR REPAIR OR REPLACEMENT OF CURB AND GUTTER EXCEPT WHERE SHOWN OTHERWISE ON PLANS.

18. NO SEPARATE PAYMENT SHALL BE PROVIDED FOR REPLACING EXISTING GRAVEL OR ROAD BASE IN UNPAVED AREAS TO CONDITION EQUAL TO, OR BETTER THAN, PRE–EXISTING.

19. WHERE TUNNELING IS CALLED FOR UNDER SIDEWALKS, CULVERTS, ETC., BACKFILL WITH CEMENT STABILIZED SAND, COMPACT TO 92% STD. PROCTOR.

20. THE CONTRACTOR SHALL INSURE THAT CONSTRUCTION ACTIVITIES DO NOT CHANGE, DIVERT, RESTRICT, IMPEDE OR INHIBIT EXISTING SURFACE DRAINAGE IN ANY WAY.

21. DIMENSIONS ON STREETS ARE FROM THE BACK OF CURB UNLESS OTHERWISE NOTED IN THE PLANS.

22. UNLESS STIPULATED OTHERWISE, THE OWNER WILL PAY FOR THE COSTS OF ALL TESTS REQUIRED BY THE PLANS AND SPECIFICATIONS FOR THIS PROJECT. THE CONTRACTOR SHALL GIVE THE ENGINEER ADEQUATE ADVANCE NOTICE TO ALLOW FOR THE SCHEDULING OF SUCH TESTS IN A TIMELY MANNER. IN THE EVENT ANY REQUIRED TEST FAILS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYING FOR SUCH RETESTING AS NECESSARY TO SECURE A PASSING TEST RESULT.

23. THE EXISTING CURB AND GUTTER AND DRIVEWAY APPROACHES SHALL BE SAWCUT WHEN REPLACEMENT DOES NOT END AT AN EXPANSION JOINT.

24. WHERE CONCRETE REMOVAL IS REQUIRED, CONCRETE SHALL BE SAWCUT TO A MINIMUM DEPTH OF 1". NO SEPARATE PAYMENT WILL BE MADE FOR SAWCUTTING. ITS COST SHALL BE INCLUDED IN APPLICABLE ITEMS.

25. EXISTING DRAIN LINES WHICH ARE CURRENTLY TIED INTO EXISTING CURB AND GUTTER SHALL BE RECONNECTED TO THE NEW CURB AND GUTTER. NO SEPARATE PAYMENT.

26. THE CONTRACTOR SHALL CONSTRUCT CURB BREAKS IN THE NEW CURB AND GUTTER WHERE CURB BREAKS NOW EXIST AND WHERE ADDITIONAL CURB BREAKS ARE REQUIRED TO PREVENT THE PONDING OF WATER BEHIND THE CURB OR NEAR THE STREET. DURING CONSTRUCTION, THE CONTRACTOR SHALL DETERMINE THE ELEVATION OF THE GROUND BEHIND THE CURB AND GUTTER RELATIVE TO THE NEW CURB AND GUTTER GRADE, AND IF THERE IS A POTENTIAL FOR PONDING WATER BEHIND THE CURB OR FOR POOR DRAINAGE OVER THE CURB IN ANY AREA, THE CONTRACTOR SHALL CONTACT THE OWNER PRIOR TO CONSTRUCTING THE CURB AND GUTTER TO DETERMINE IF A CURB BREAK NEEDS TO BE CONSTRUCTED OR IF THE CURB HEIGHT NEEDS TO BE ADJUSTED IN A LOCALIZED AREA.

27. THE CONTRACTOR SHALL MAKE EVERY REASONABLE EFFORT TO KEEP ALL STREETS, ROADS ALLEYS, RIGHTS–OF–WAY, AND/OR EASEMENTS OPEN TO THE PUBLIC AND MAINTAIN ACCESS TO ALL ADJOINING PROPERTIES DURING CONSTRUCTION. IF IT BECOMES NECESSARY TO INTERRUPT ACCESS TO PRIVATE PROPERTY, THE CONTRACTOR SHALL GIVE THE AFFECTED PARTIES ADEQUATE ADVANCE NOTICE OF THE DATE AND DURATION OF THE INTERRUPTION OF ACCESS. IF IT BECOMES NECESSARY TO CLOSE A STREET, ROAD, ALLEY OR OTHER PUBLIC RIGHT–OF–WAY, THE CONTRACTOR SHALL GIVE ADEQUATE ADVANCE NOTICE TO THE AGENCIES; THE FIRE DEPARTMENT; THE EMS; THE SCHOOL DISTRICT'S TRANSPORTATION DEPARTMENT; AFFECTED AMBULANCE SERVICES; AND ALL AFFECTED UTILITIES.

28. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING THE EXACT LOCATION OF UTILITIES. IF UTILITY LINES ARE ENCOUNTERED DURING MIXING OPERATIONS OF THE TOP 6" OF EXISTING ROADWAY, THE OWNER WILL BE RESPONSIBLE FOR THEIR REPAIR. IF THE CONTRACTOR ENCOUNTERS UTILITY LINES BEYOND THE 6" DEPTH, HE WILL BE RESPONSIBLE FOR THEIR REPAIR IF DAMAGED.

29. IN AREAS WHERE WATER LINE IS TO BE INSTALLED NEAR AN EXISTING POWER POLE, NOTIFY THE CENTERPOINT ENGERY 48 HOURS IN ADVANCE OF DIGGING SO THAT THEY CAN BRACE THE POLE DURING EXCAVATION AND BACKFILLING OF LINE. A MINIMUM OF 3' FROM EDGE OF POLE TO EDGE OF TRENCH SHOULD BE MAINTAINED DURING CONSTRUCTION OF ALL UTILITY LINES IN THIS PROJECT. CONSULT CENTERPOINT ENERGY PERSONNEL WHENEVER THIS MINIMUM CLEARANCE CANNOT BE MAINTAINED.

30. WATER LINES WHICH RUN PARALLEL WITH A POWER LINE AND ARE TO BE INSTALLED CLOSER THAN SIX FEET TO A POWER POLE SHALL BE INSTALLED BY BORE FROM A POINT FIVE FEET BEFORE THE POWER POLE TO A POINT FIVE FEET PAST THE POWER POLE (TEN FOOT BORE LENGTH). WHERE IT IS NECESSARY TO OPEN CUT CLOSER THAN THIS DISTANCE TO A POWER POLE IN ORDER TO INSTALL FITTINGS, VALVES, ETC., THE CONTRACTOR SHALL RESTRAIN THE POLE DURING CONSTRUCTION, OR SHALL CAUSE THE POWER COMPANY TO RESTRAIN THE POLE, AND ALL BACKFILL WITHIN FIVE FEET LONGITUDINALLY OF THE POWER POLE SHALL BE COMPACTED TO NOT LESS THAN 95% STD. PROCTOR BEFORE RELEASING THE POLE. NO SEPARATE PAYMENT WILL BE MADE FOR RESTRAINING THE POLE DURING CONSTRUCTION.

31. CONTRACTOR SHALL ADJUST GRADE OF VALVE BOXES TO MATCH FINISHED GRADE AFTER FINAL GRADING. TOPS SHALL MATCH SLOPE OF FINISHED GRADE.

32. EXISTING 3/4" OR 1" COPPER WATER SERVICE LINES IN GOOD CONDITION SHALL REMAIN IN SERVICE AND BE CONNECTED TO NEW WATER MAIN. OTHER TYPES OF SERVICE PIPE SHALL BE REPLACED WITH COPPER TO METER.

33. AFTER NEW WATER LINES HAVE PASSED PRESSURE AND BACTERIOLOGICAL TESTS, CONNECT EXISTING SERVICE LINES TO NEW LINE AND ABANDON OLD LINE. DISRUPTION OF SERVICE SHALL BE KEPT TO A MINIMUM.

34. REMOVING EXISTING FIRE HYDRANTS SHALL CONSIST OF REMOVING EXISTING FIRE HYDRANT AND REMOVING THE VALVE BOX IN UNPAVED AREAS OR OBLITERATING THE VALVE BOX IN PAVED AREAS.

35. OBLITERATION OF EXISTING VALVE BOXES INCLUDES REMOVING VALVE BOX LID AND FILLING VALVE BOX WITH CONCRETE FLUSH TO TOP OF BOX AND DISPOSING OF LID. THE PAVEMENT SHALL BE REPAIRED TO A CONDITION EQUAL TO OR BETTER THAN PRIOR TO CONSTRUCTION. NO SEPARATE PAY FOR PAVEMENT REPAIR AT THESE AREAS.

36. NO SEPARATE PAYMENT WILL BE MADE FOR REMOVAL AND DISPOSAL OF EXISTING TEES AND OTHER FITTINGS WITHIN 5' OF THE POINT WHERE A NEW LINE TIES INTO AN EXISTING LINE. IN SUCH CASES THE REMOVAL OF THE FITTING(S) WILL BE CONSIDERED PART OF THE TIE–IN.

37. WHERE A WET CONNECTION TO AN EXISTING 6" OR 8" LINE IS TO BE MADE BY CUTTING THE EXISTING LINE, CLASS 150 C–900 PVC PIPE SHALL BE USED TO REPLACE THE SECTION OF OLD LINE REMOVED AND SHALL BE COUPLED TO THE EXISTING LINE WITH A SOLID D.I. SLEEVE. SEPARATE COMPENSATION WILL BE MADE FOR THE REQUIRED DUCTILE IRON FITTINGS. THE BID PRICE FOR WET CONNECTION TO AN EXISTING LINE SHALL INCLUDE LABOR, TOOLS, PIPE, AND MISCELLANEOUS FITTINGS FOR SMALL DIAMETER PIPE NOT OTHERWISE PROVIDED FOR IN THE BID PROPOSAL.

38. FOR SMALL DIAMETER LINES TO BE ABANDONED, CONTRACTOR SHALL PLUG OR CAP WITH A BRASS FITTING THE TEE OR SADDLE WHICH CONNECTS TO THE WATER MAIN TO REMAIN IN SERVICE. NO SEPARATE PAYMENT WILL BE MADE FOR THE REQUIRED BRASS PLUGS AND FITTINGS.

39. TYPICAL 3/4" AND 1" WATER SERVICE CONSISTS OF SERVICE CLAMP, CORPORATION STOP, METER STOP AND CONNECTION TO EXISTING METER. WHERE TWO METERS ARE SERVED OFF A 1" LINE WITH A BRANCH FITTING AND 3/4" COPPER SERVICE LINE, IT WILL BE CONSIDERED TWO SERVICES, AND THE 1" COPPER TUBING WILL BE PAID FOR ON A LINEAR FOOT BASIS.

40. A 2"X6" LONG BRASS NIPPLE AND A 2" TRANSITION COUPLING SHALL BE INCLUDED IN THE UNIT BID PRICE OF A 2" WET CONNECTION.

41. ALL PVC WATER LINE SHALL BE INSTALLED WITH TRACE WIRE PER TECHNICAL SPECIFICATION.

42. EXISTING METERS AND SALVAGEABLE METER BOXES TO BE REPLACED SHALL BE DELIVERED TO CITY WAREHOUSE.

43. THE CONTRACTOR SHALL HAVE ON–SITE A STEEL PLATE OR OTHER DEVICE OF SUFFICIENT STRENGTH TO PLACE ACROSS AN EXCAVATED TRENCH TO ALLOW VEHICLES TO CROSS IN AN EMERGENCY OR AT A DEAD–END STREET. THE CONTRACTOR SHALL PLACE THE PLATE (DEVICE) ACROSS THE TRENCH IMMEDIATELY WHEN NEEDED.

NO.	REVISIONS	DATE:

SHEET INDEX, LEGEND, AND PROJECT LOCATION MAP

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020

PROJECT MGR. JE

TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 2

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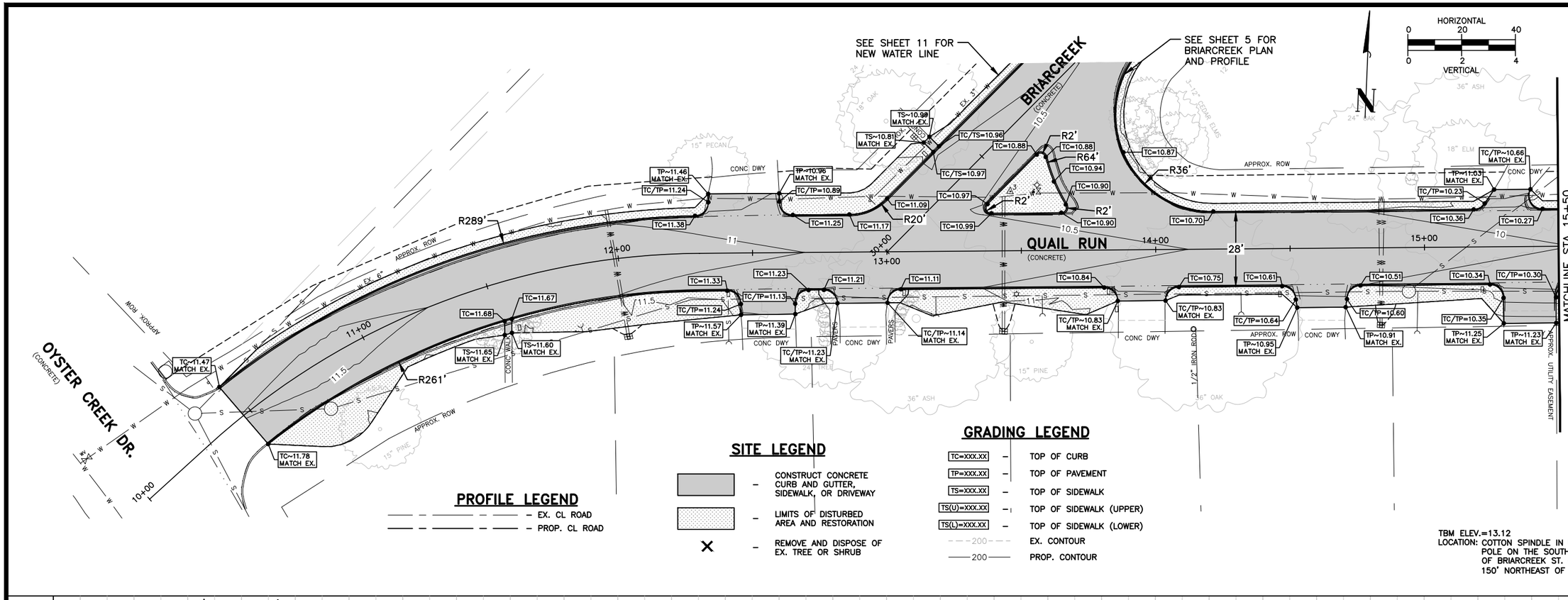


PROFILE LEGEND

- EX. CL ROAD
- PROP. CL ROAD

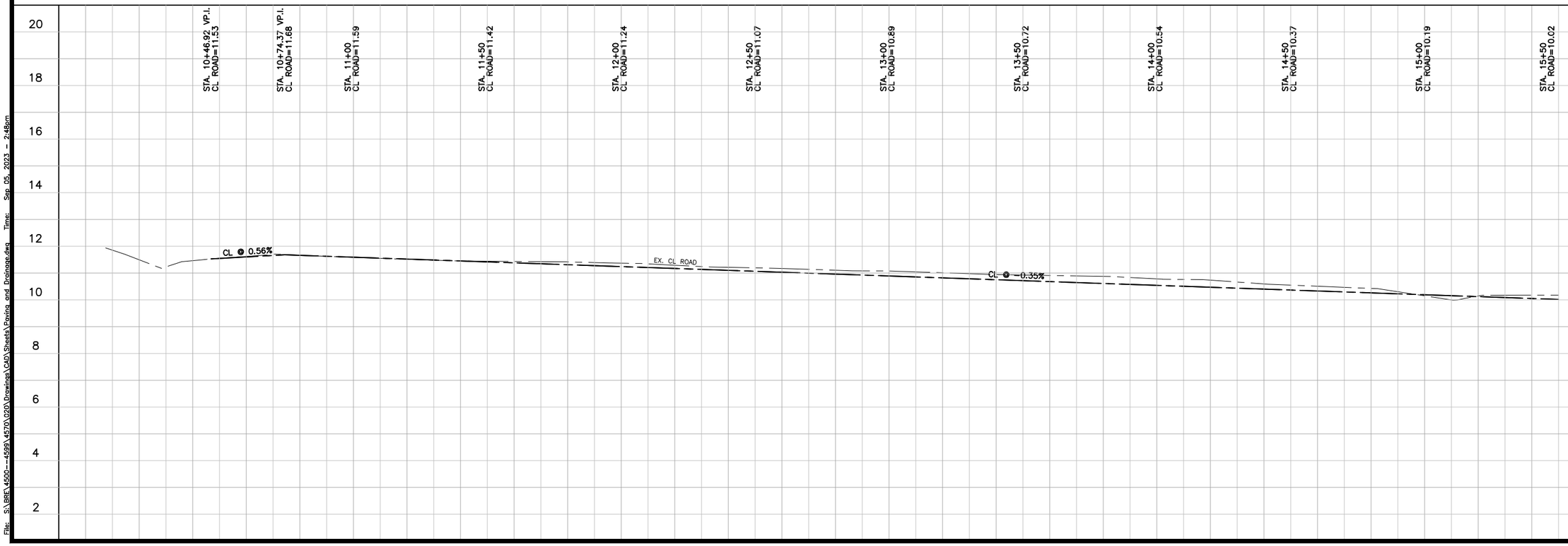
SITE LEGEND

- CONSTRUCT CONCRETE CURB AND GUTTER, SIDEWALK, OR DRIVEWAY
- LIMITS OF DISTURBED AREA AND RESTORATION
- REMOVE AND DISPOSE OF EX. TREE OR SHRUB

GRADING LEGEND

- TC=XXX.XX – TOP OF CURB
- TP=XXX.XX – TOP OF PAVEMENT
- TS=XXX.XX – TOP OF SIDEWALK
- TS(U)=XXX.XX – TOP OF SIDEWALK (UPPER)
- TS(L)=XXX.XX – TOP OF SIDEWALK (LOWER)
- 200 – EX. CONTOUR
- 200 – PROP. CONTOUR

TBM ELEV.=13.12
LOCATION: COTTON SPINDLE IN UTILITY POLE ON THE SOUTHEAST SIDE OF BRIARCREEK ST. APPROX. 150' NORTHEAST OF 4 OAKS ST.



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NO.	REVISIONS	DATE:

QUAIL RUN P&P 10+00 - 15+50

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

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SHEET 3

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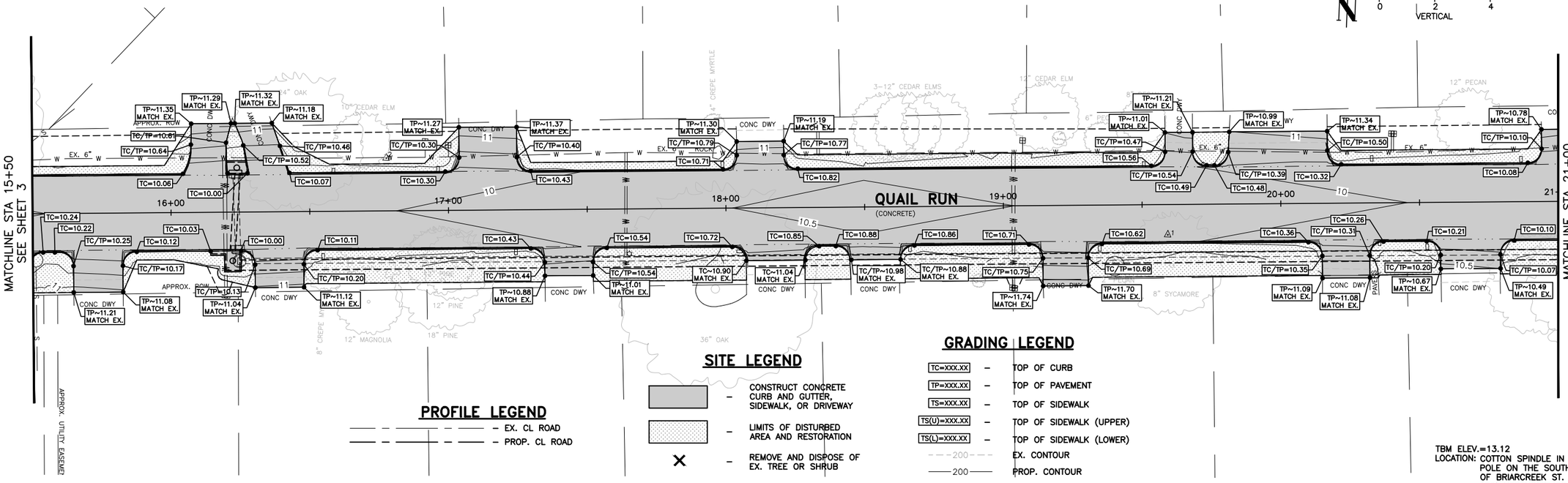

PROFILE LEGEND

- EX. CL ROAD
- PROP. CL ROAD

SITE LEGEND

- CONSTRUCT CONCRETE CURB AND GUTTER, SIDEWALK, OR DRIVEWAY
- LIMITS OF DISTURBED AREA AND RESTORATION
- REMOVE AND DISPOSE OF EX. TREE OR SHRUB

GRADING LEGEND

- TC=XXX.XX – TOP OF CURB
- TP=XXX.XX – TOP OF PAVEMENT
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- TS(U)=XXX.XX – TOP OF SIDEWALK (UPPER)
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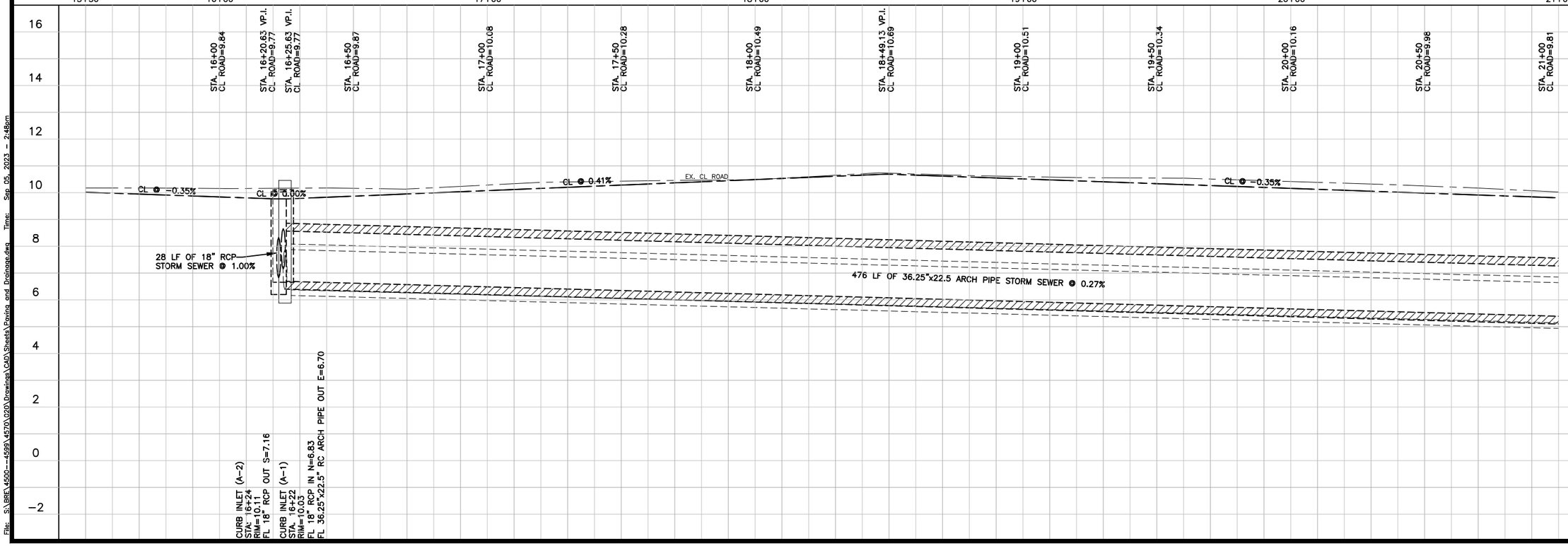
- 200 – EX. CONTOUR
- 200 – PROP. CONTOUR

HORIZONTAL 0 20 40
VERTICAL 0 2 4

TBM ELEV.=13.12
LOCATION: COTTON SPINDLE IN UTILITY POLE ON THE SOUTHEAST SIDE OF BRIARCREEK ST. APPROX. 150' NORTHEAST OF 4 OAKS ST.



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NO.	REVISIONS	DATE

QUAIL RUN P&P 15+50 - 21+00
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS
CITY OF RICHWOOD

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405
STRAND ASSOCIATES®
SHEET 4

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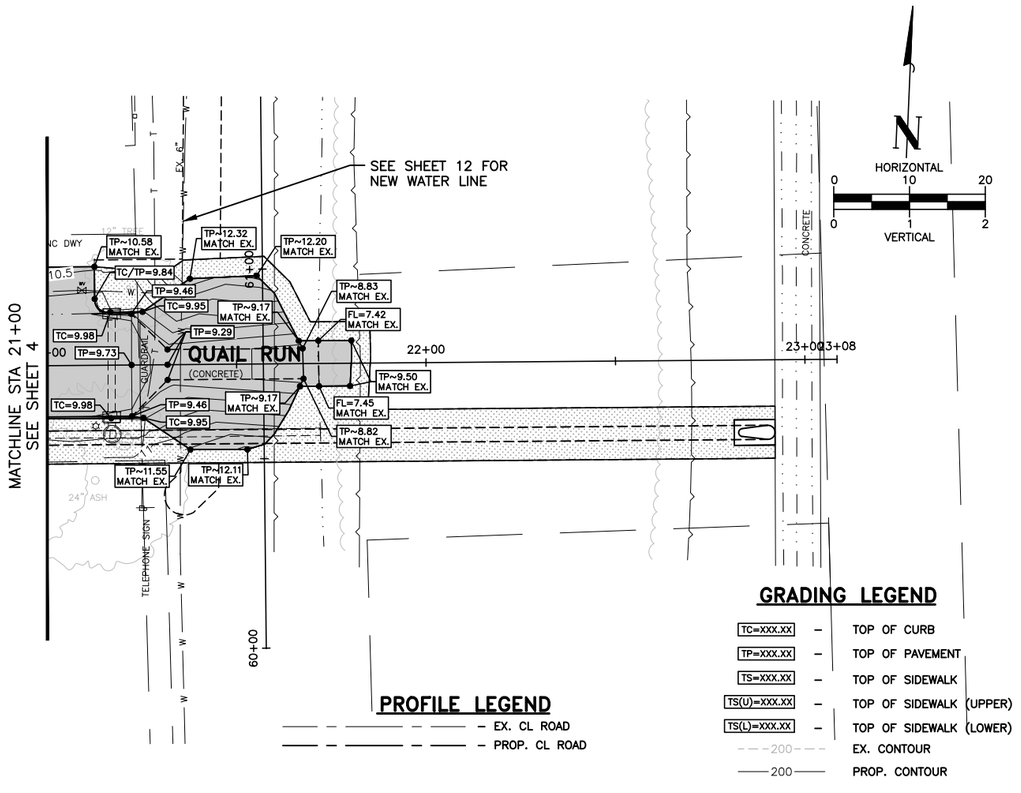
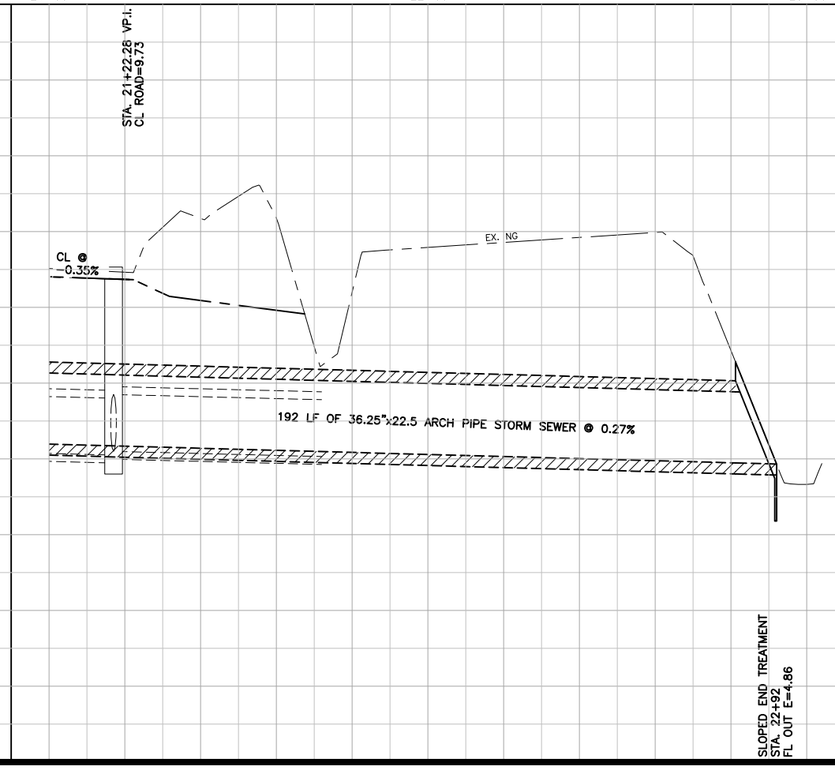


PROFILE LEGEND

- EX. CL ROAD
- PROP. CL ROAD

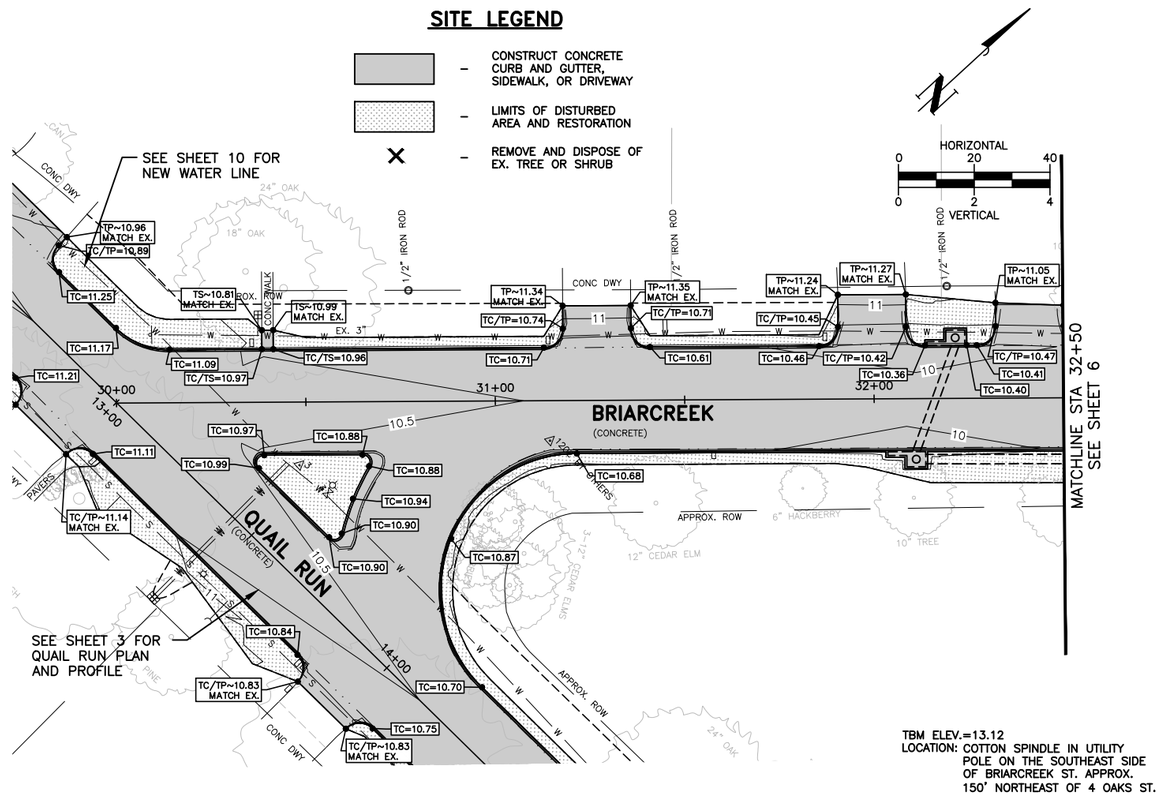
GRADING LEGEND

TC=XXX.XX	–	TOP OF CURB
TP=XXX.XX	–	TOP OF PAVEMENT
TS=XXX.XX	–	TOP OF SIDEWALK
TS(U)=XXX.XX	–	TOP OF SIDEWALK (UPPER)
TS(L)=XXX.XX	–	TOP OF SIDEWALK (LOWER)
200	–	EX. CONTOUR
200	–	PROP. CONTOUR



SITE LEGEND

- CONSTRUCT CONCRETE CURB AND GUTTER, SIDEWALK, OR DRIVEWAY
- LIMITS OF DISTURBED AREA AND RESTORATION
- REMOVE AND DISPOSE OF EX. TREE OR SHRUB



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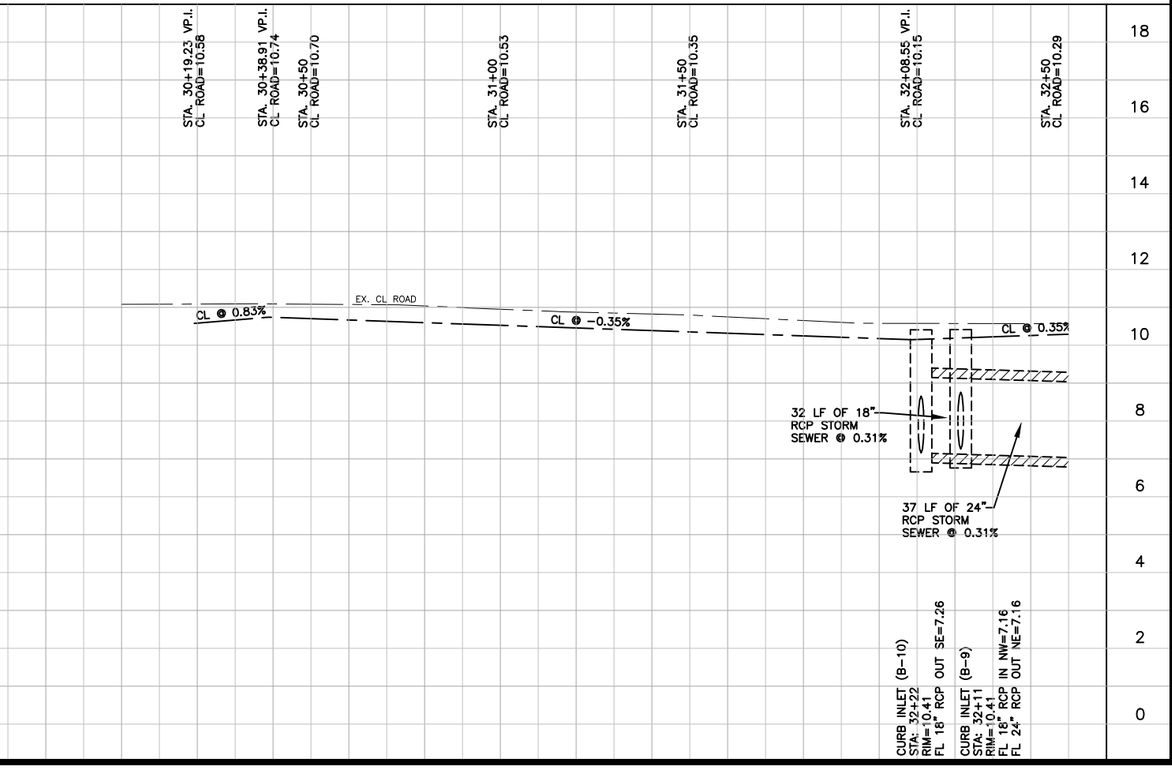
LOCATION: COTTON SPINDLE IN UTILITY POLE ON THE SOUTHEAST SIDE OF BRIARCREEK ST. APPROX. 150' NORTHEAST OF 4 OAKS ST.



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NO.	REVISIONS	DATE:

QUAIL RUN P&P 21+00 - 23+08 & BRIAR CREEK P&P 30+00 - 32+50AGE I

CITY OF RICHWOOD

CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020

PROJECT MGR. JE

TBPE No. F-8405

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SHEET 5

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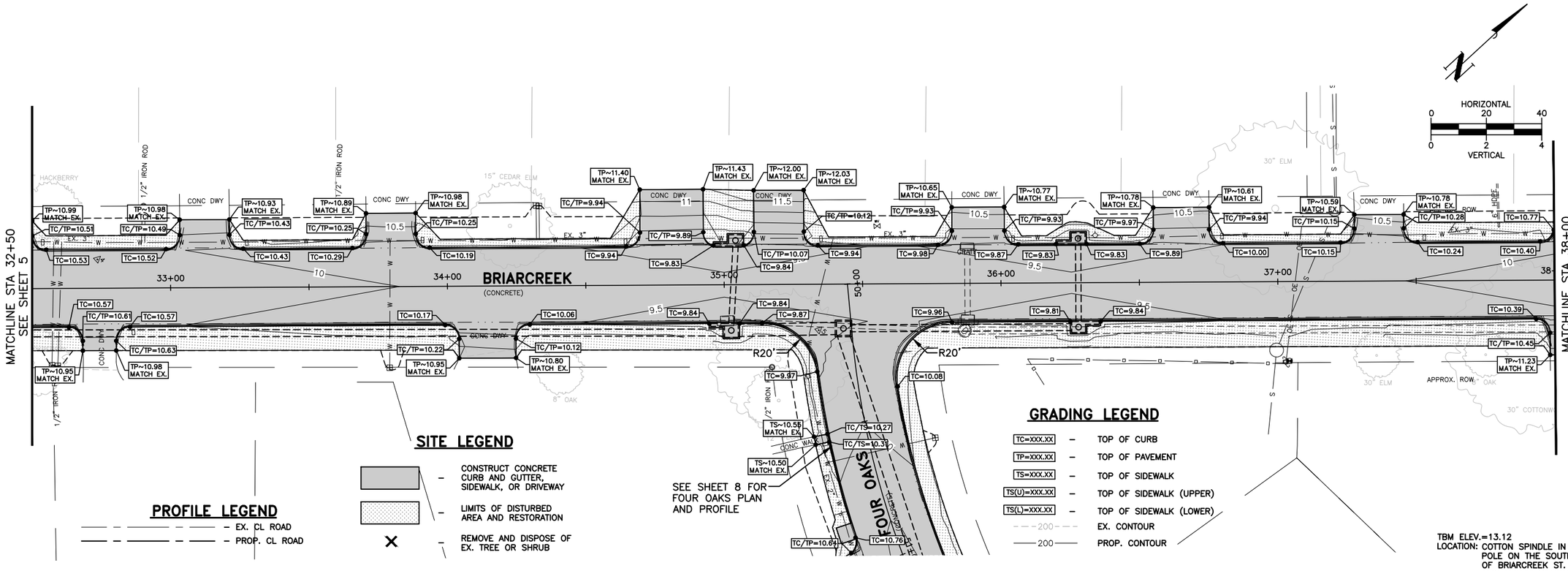

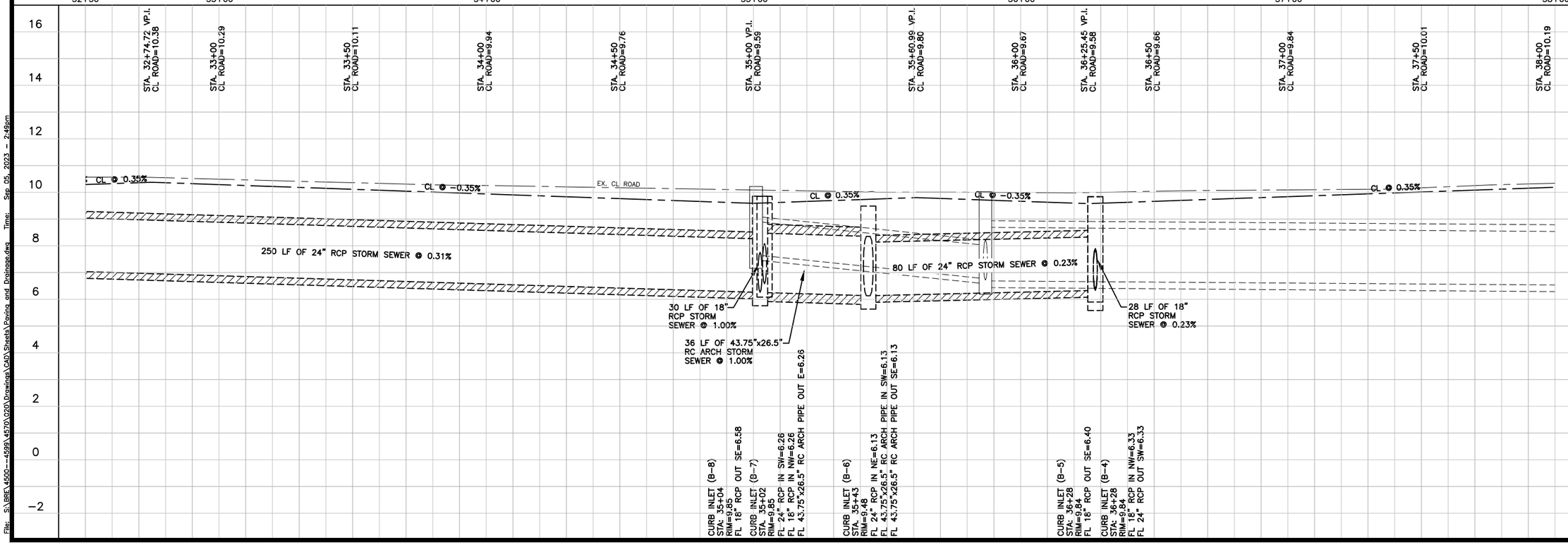

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NO.	REVISIONS	DATE:

BRIAR CREEK P&P 32+50 - 38+00

CITY OF RICHWOOD
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JOB NO.
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PROJECT MGR.
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TBPE No. F-8405

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SHEET
6

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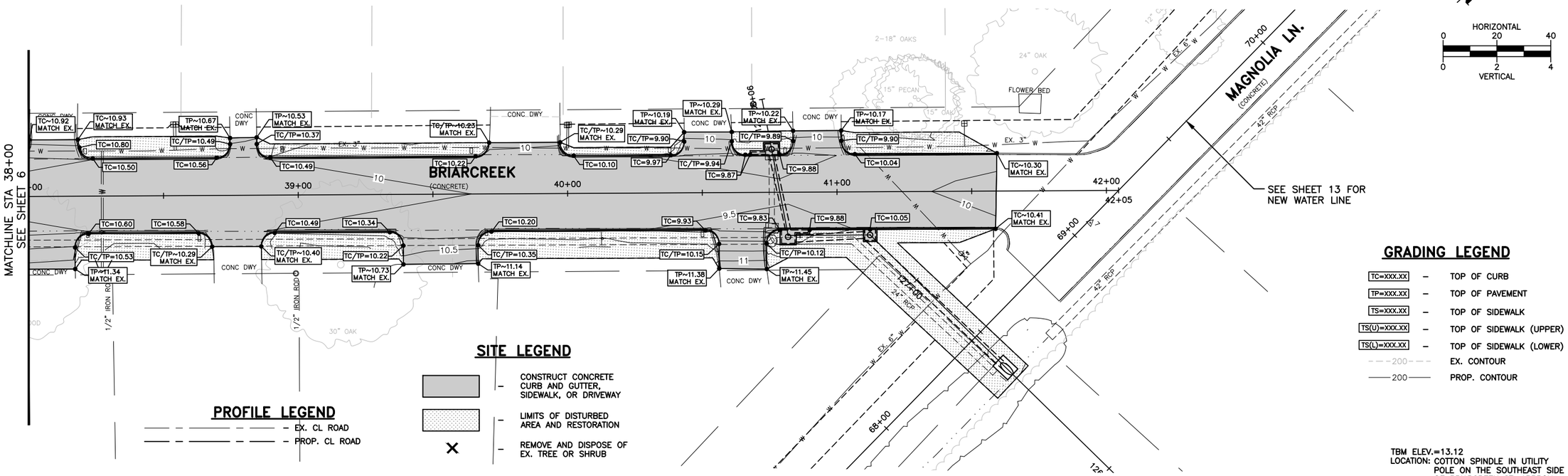
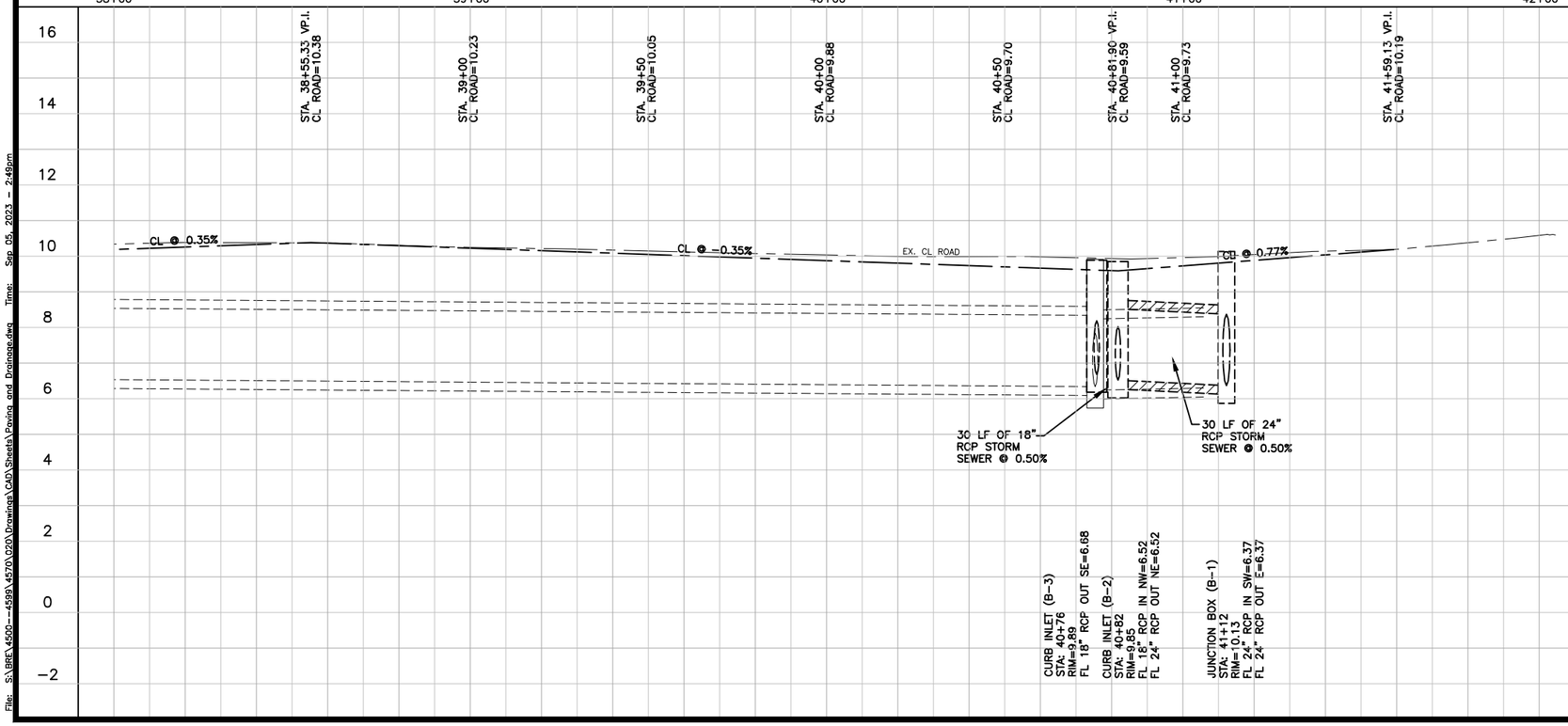


TBM ELEV.=13.12
LOCATION: COTTON SPINDLE IN UTILITY POLE ON THE SOUTHEAST SIDE OF BRIARCREEK ST. APPROX. 150' NORTHEAST OF 4 OAKS ST.



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NO.	REVISIONS	DATE

BRIAR CREEK P&P 38+00 - 42+05

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405
STRAND ASSOCIATES®
SHEET 7

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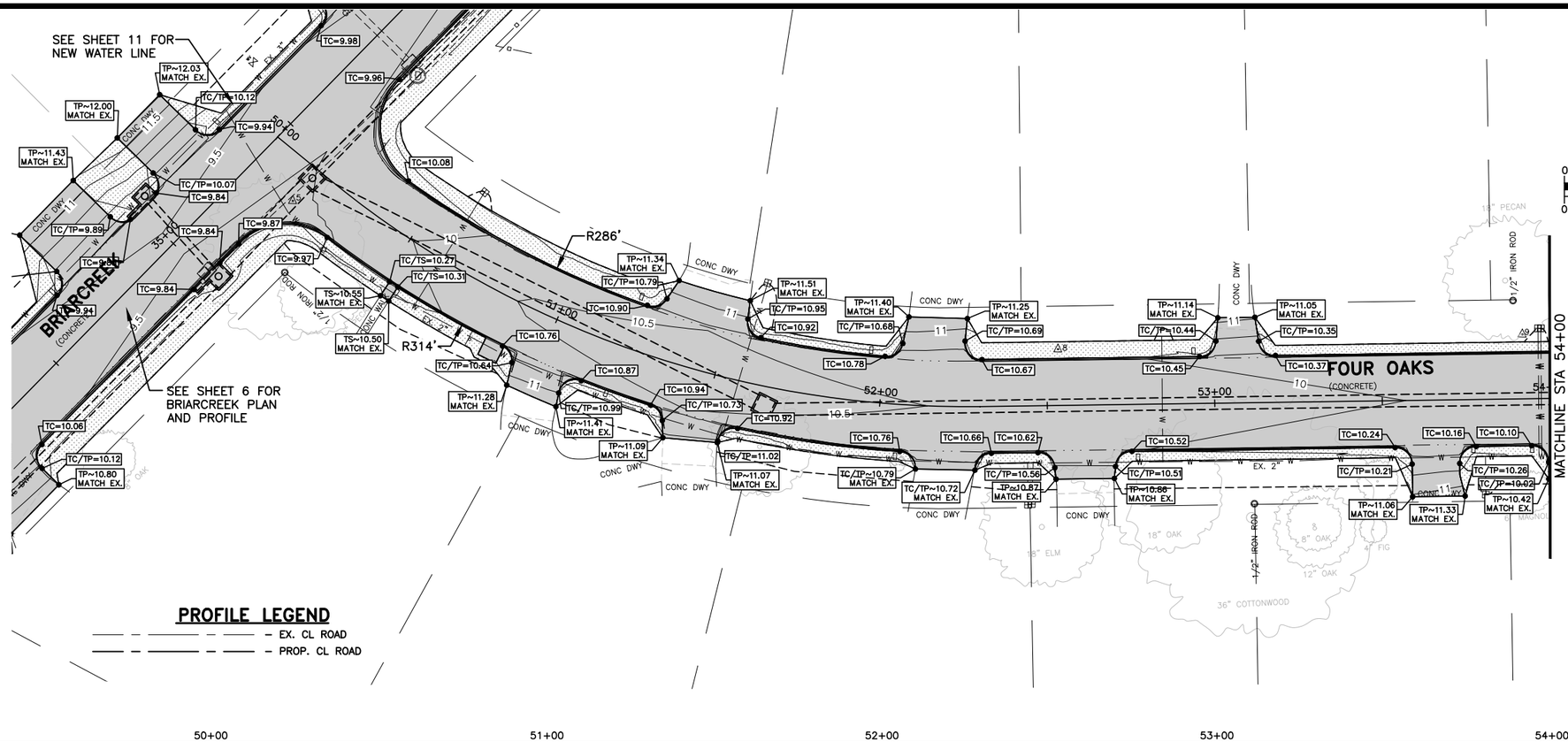

PROFILE LEGEND

- EX. CL ROAD
- PROP. CL ROAD

SITE LEGEND

- CONSTRUCT CONCRETE CURB AND GUTTER, SIDEWALK, OR DRIVEWAY
- LIMITS OF DISTURBED AREA AND RESTORATION
- REMOVE AND DISPOSE OF EX. TREE OR SHRUB

GRADING LEGEND

TC=XXX.XX	–	TOP OF CURB
TP=XXX.XX	–	TOP OF PAVEMENT
TS=XXX.XX	–	TOP OF SIDEWALK
TS(U)=XXX.XX	–	TOP OF SIDEWALK (UPPER)
TS(L)=XXX.XX	–	TOP OF SIDEWALK (LOWER)
200	–	EX. CONTOUR
200	–	PROP. CONTOUR

HORIZONTAL 0 20 40
VERTICAL 0 2 4

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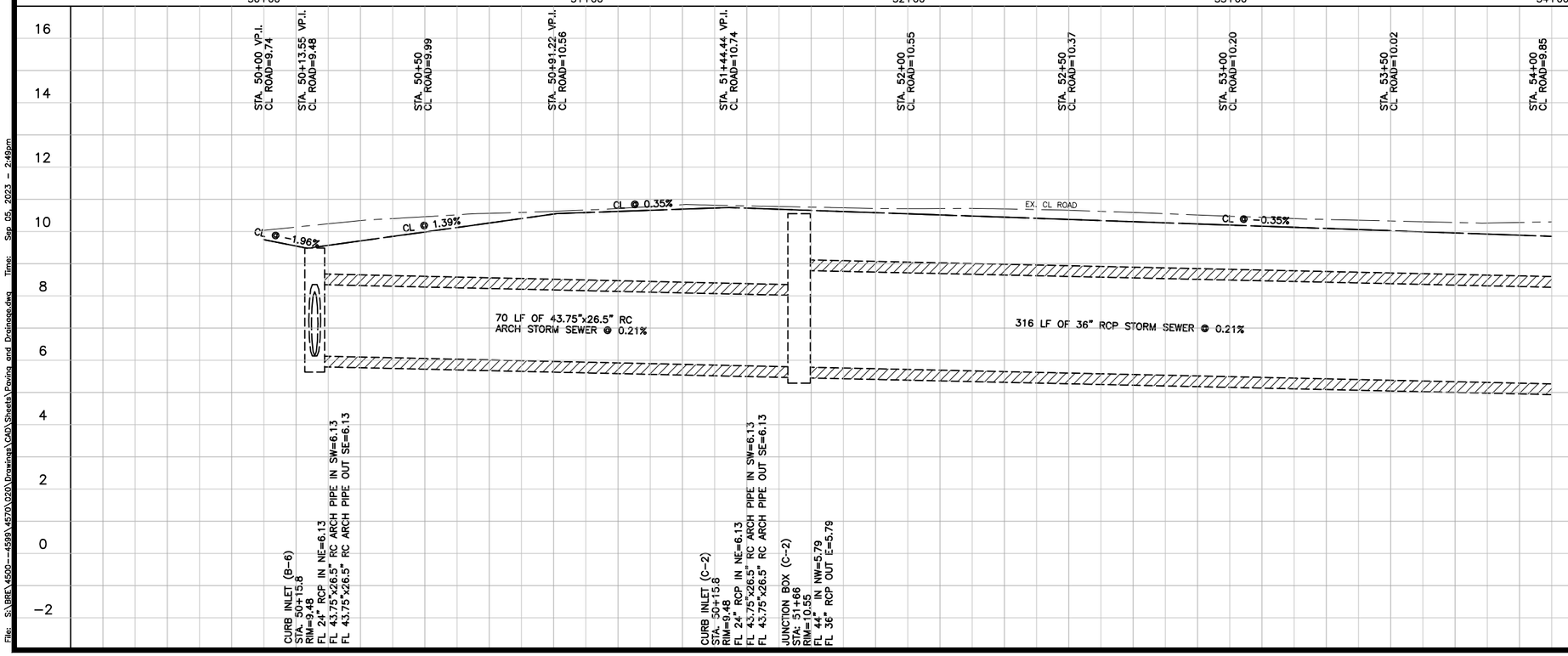

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NO.	REVISIONS	DATE:

FOUR OAKS P&P 50+00 - 54+00

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 8

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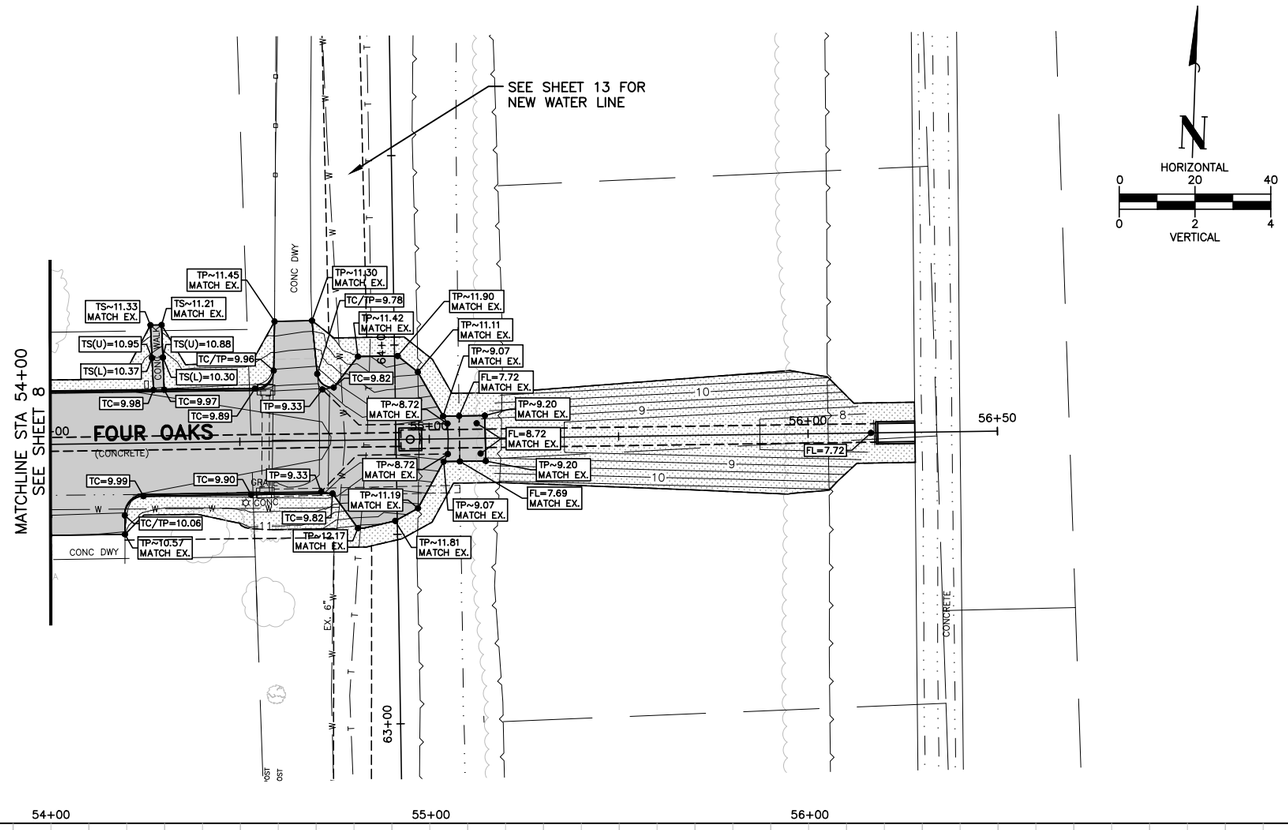

SITE LEGEND

- CONSTRUCT CONCRETE CURB AND GUTTER, SIDEWALK, OR DRIVEWAY
- LIMITS OF DISTURBED AREA AND RESTORATION
- REMOVE AND DISPOSE OF EX. TREE OR SHRUB

GRADING LEGEND

- TC=XXX.XX – TOP OF CURB
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- TS=XXX.XX – TOP OF SIDEWALK
- TS(U)=XXX.XX – TOP OF SIDEWALK (UPPER)
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PROFILE LEGEND

- EX. CL ROAD
- PROP. CL ROAD

TBM ELEV.=13.12
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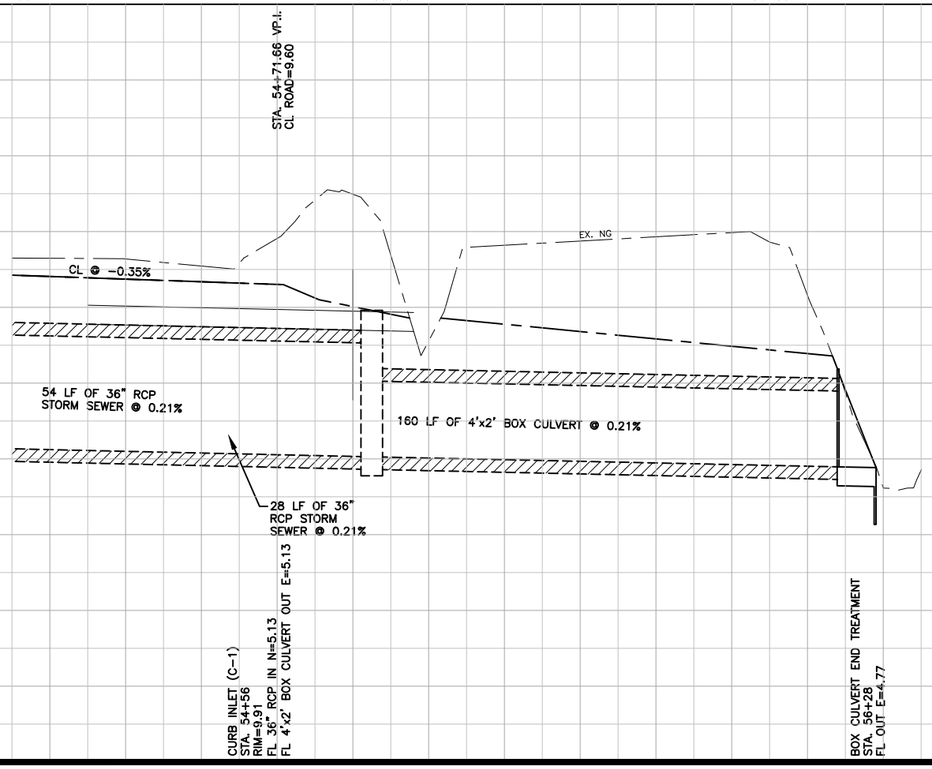


NO.	REVISIONS	DATE:

FOUR OAKS P&P 54+00 - 56+50

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

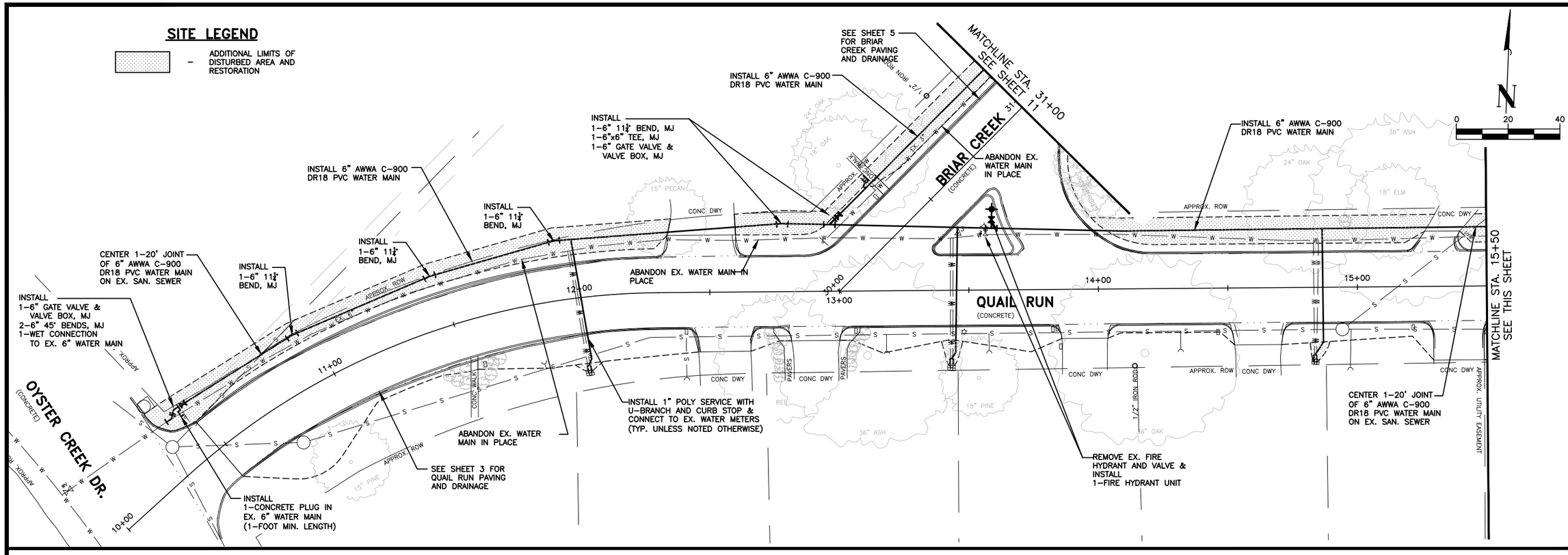
JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

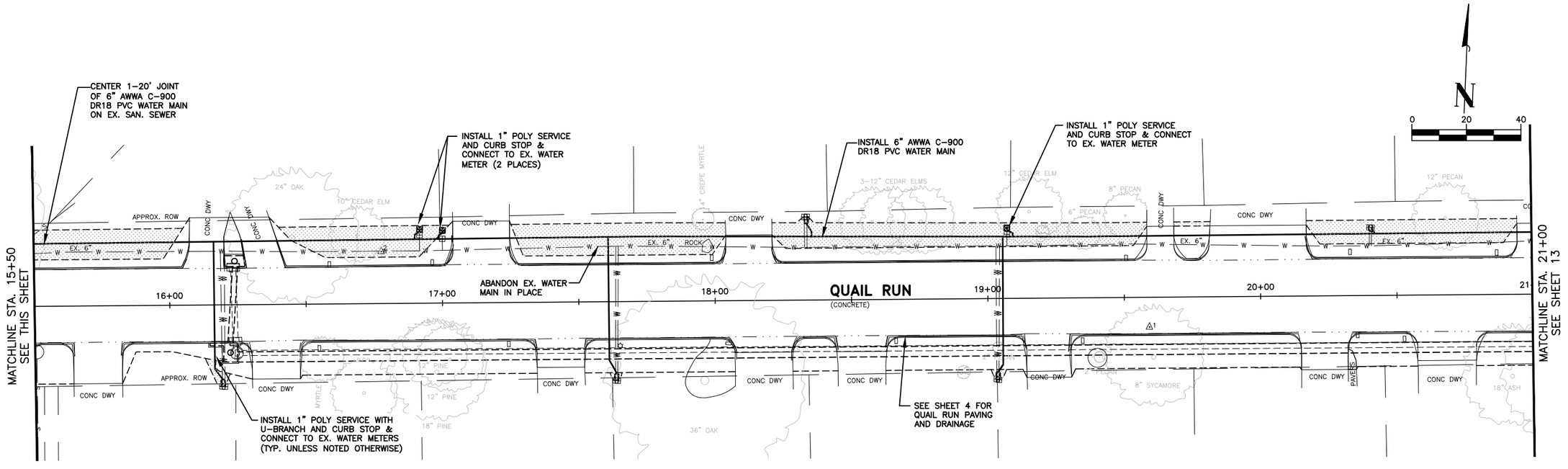
STRAND ASSOCIATES®

SHEET 9

SITE LEGEND

ADDITIONAL LIMITS OF DISTURBED AREA AND RESTORATION





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NO.	REVISIONS	DATE:

QUAIL RUN WATER LINES

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 10

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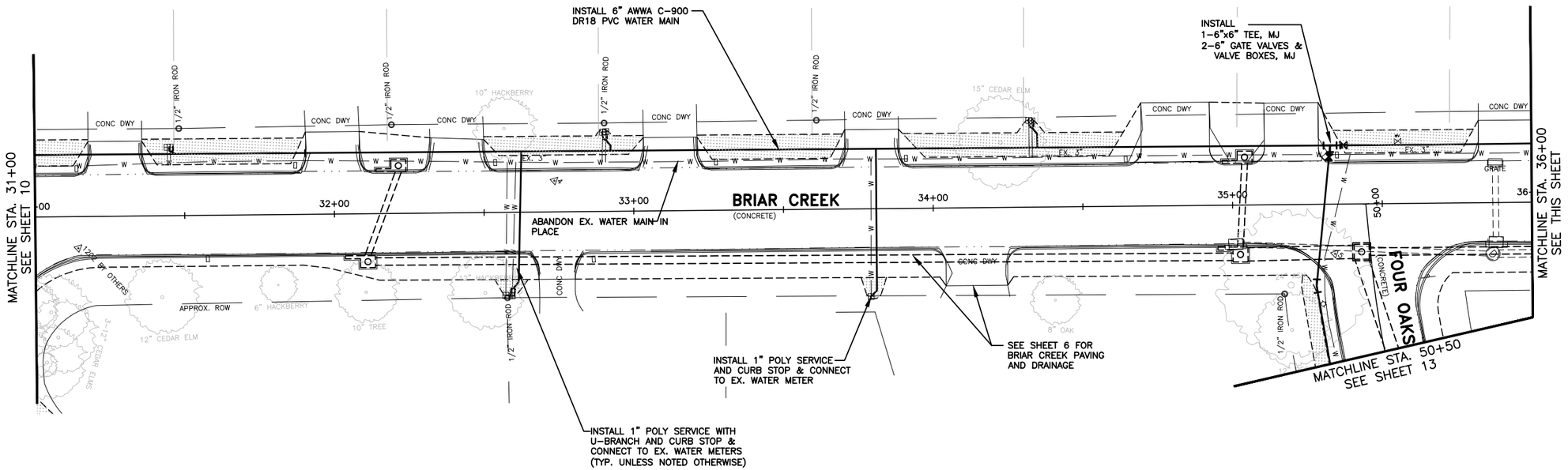
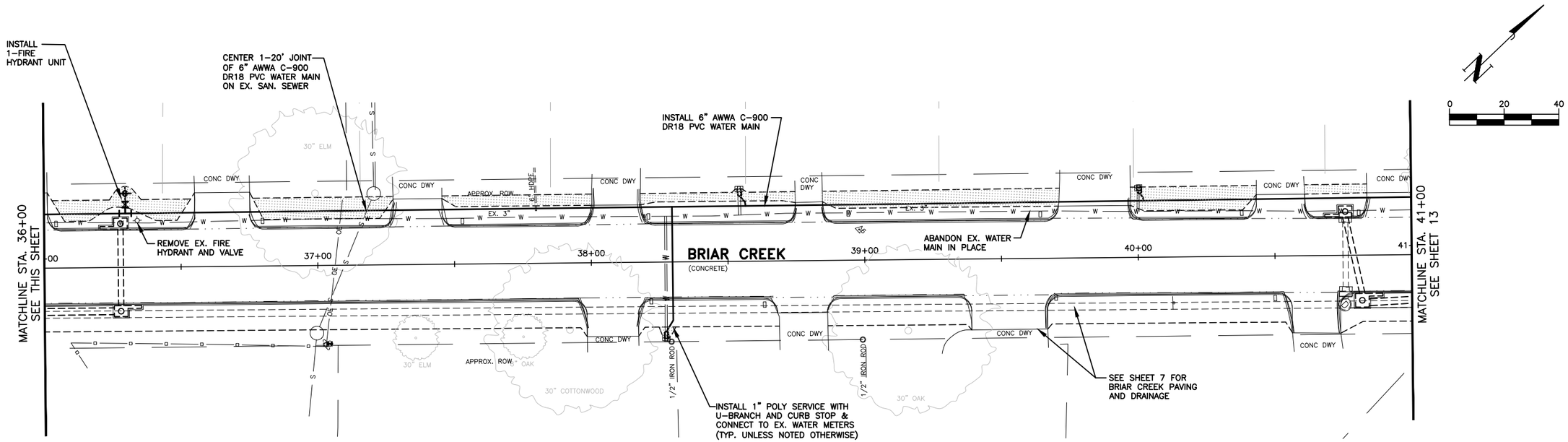
SITE LEGEND

ADDITIONAL LIMITS OF DISTURBED AREA AND RESTORATION





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DATE:

REVISIONS

NO.

BRIAR CREEK WATER LINES

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO.
4570.020

PROJECT MGR.
JE

TBPE No. F-8405

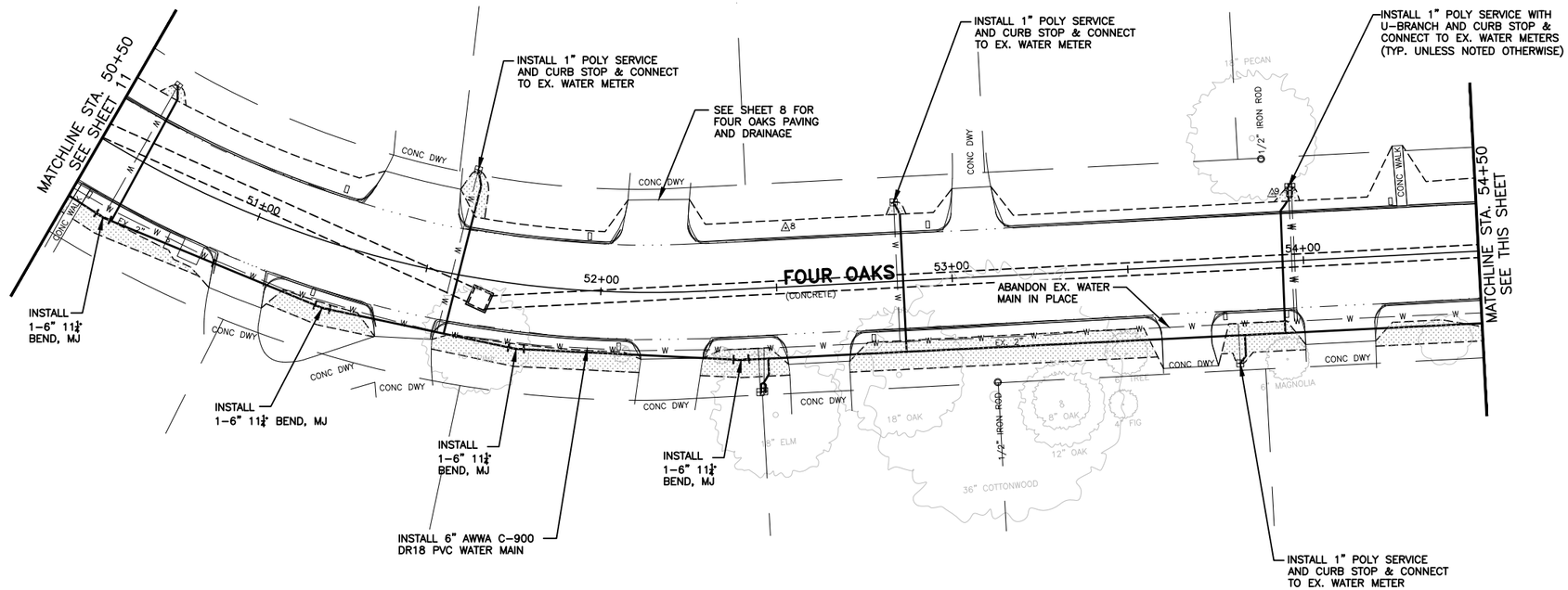
STRAND ASSOCIATES®

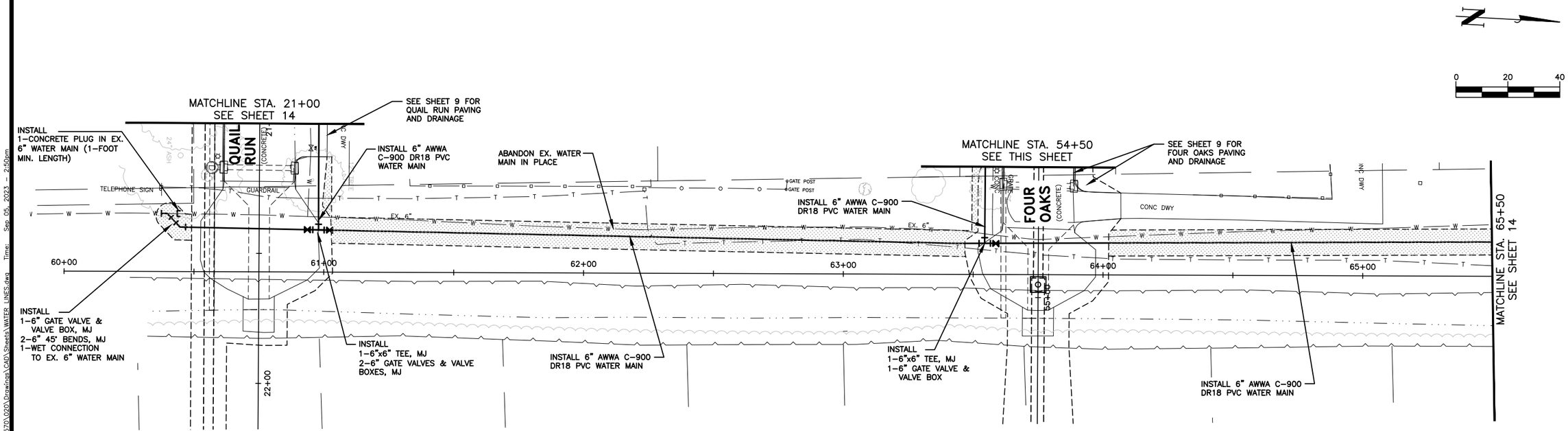
SHEET
11

File: S:\BRE\4500—4599\4570\020\Drawings\CAD\Sheets\WATER_LINES.dwg Time: Sep. 05, 2023 - 2:50pm

SITE LEGEND

ADDITIONAL LIMITS OF DISTURBED AREA AND RESTORATION





DATE:

REVISIONS

NO.

FOUR OAKS WATER LINES

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO.
4570.020

PROJECT MGR.
JE

TBPE No. F-8405

STRAND ASSOCIATES®

SHEET
12

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SITE LEGEND

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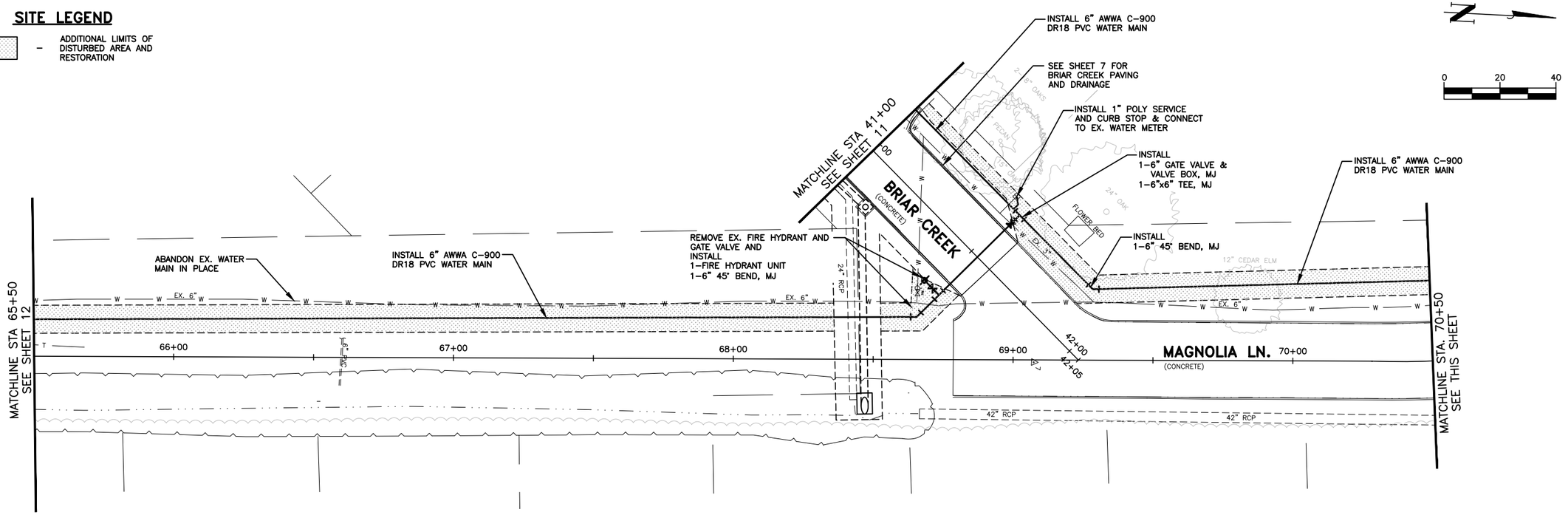
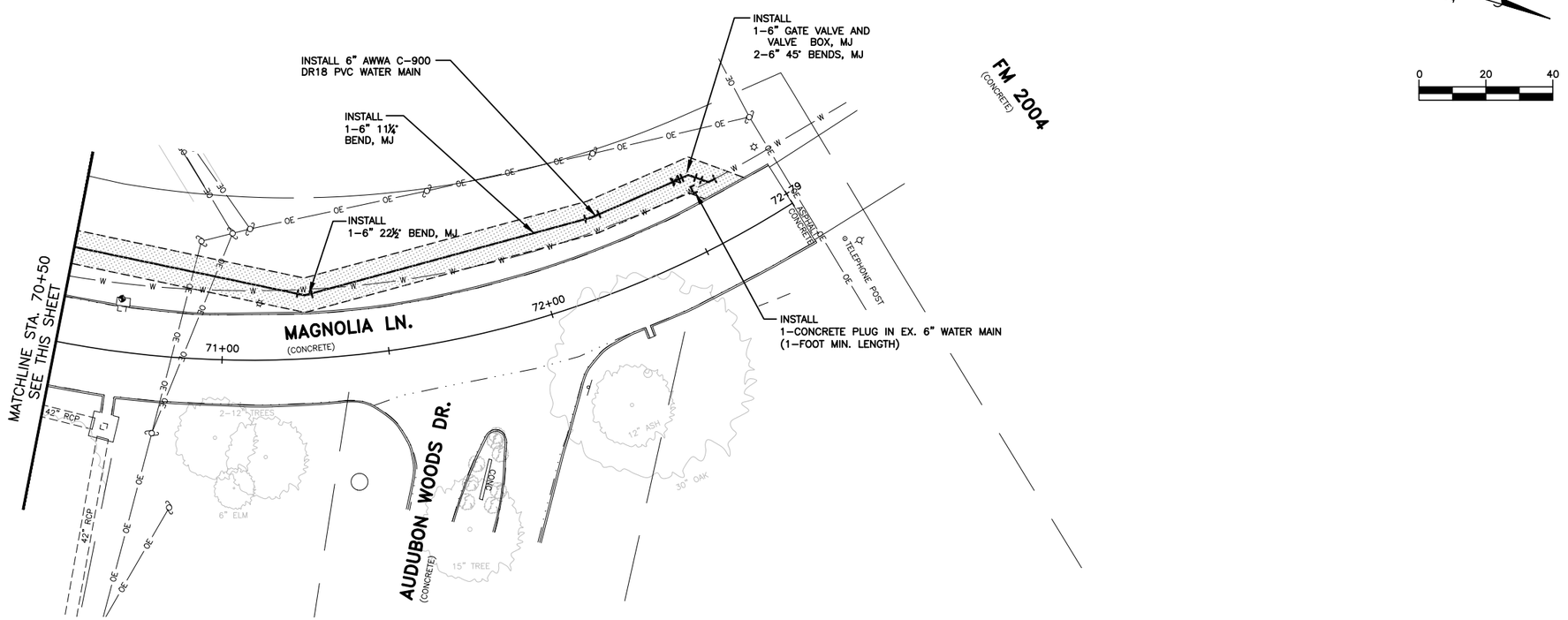




DATE:

REVISIONS

NO.

MAGNOLIA LN. WATER LINES

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

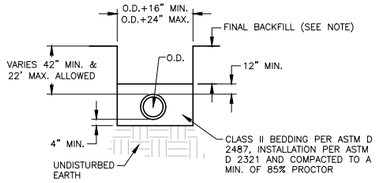
JOB NO. 4570.020

PROJECT MGR. JE

TBPE No. F-8405

STRAND ASSOCIATES®

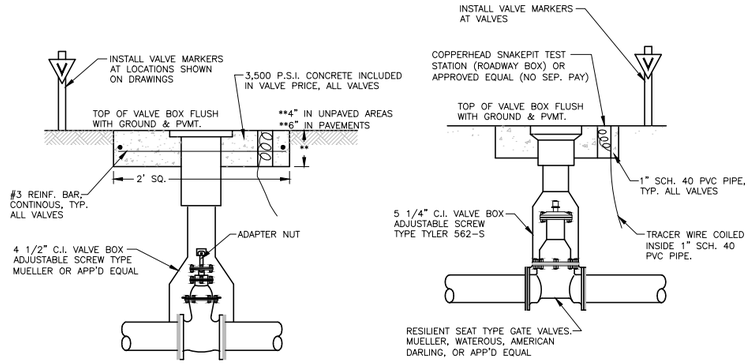
SHEET 13



EMBEDMENT CROSS SECTION FOR PVC PIPE
NTS

NOTES:
1. FINAL BACKFILL IN UNPAVED/OPEN AREAS SHALL BE "COMMON BACKFILL" IN CONFORMANCE WITH SPEC. 31 23 33.

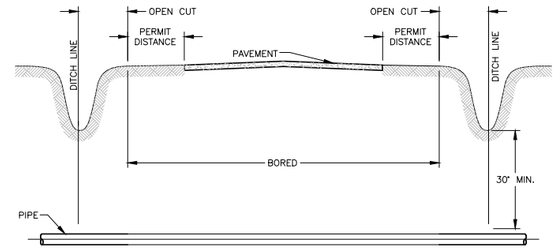
2. FINAL BACKFILL IN PAVED STREETS, DRIVEWAYS AND ALLEYS SHALL CONFORM TO THE APPLICABLE "BACKFILL & PAVEMENT REPAIR DETAIL FOR OPEN CUT TRENCH" ON THIS SHEET.



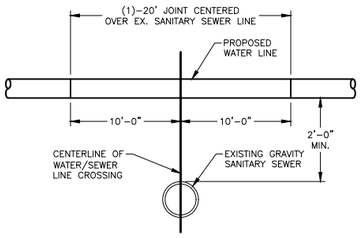
BRASS BALL VALVES 2" & SMALLER W/BRASS 2"x2" ADAPTER NUT

3" & LARGER

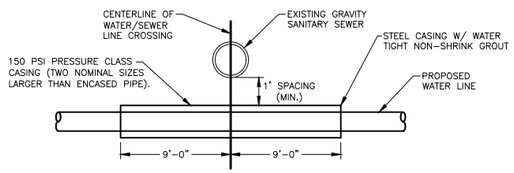
GATE VALVES
NTS



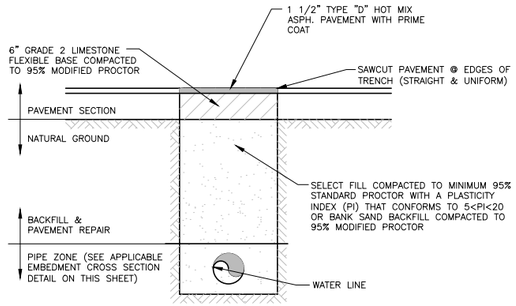
TYPICAL BORED ROAD CROSSING SECTION
NTS



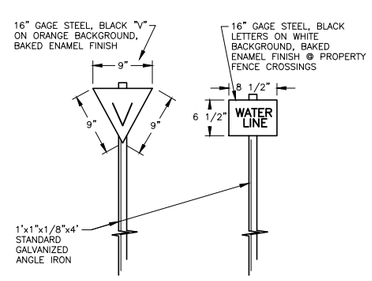
NEW WATER MAIN CROSSING OVER EXISTING SANITARY SEWER WHERE 9' SEPARATION CANNOT BE ACHEIVED
NTS



NEW WATER MAIN CROSSING UNDER EXISTING SANITARY SEWER
NTS



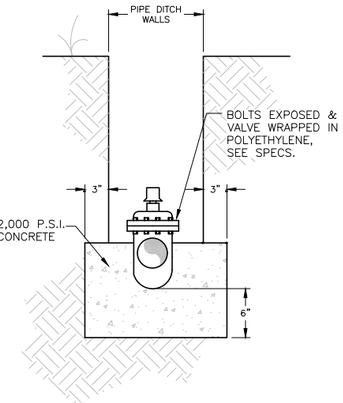
BACKFILL & PAVEMENT REPAIR DETAIL FOR OPEN CUT TRENCH, PAVED STREET, DRIVEWAY, OR ALLEY (CITY ROW)
NTS



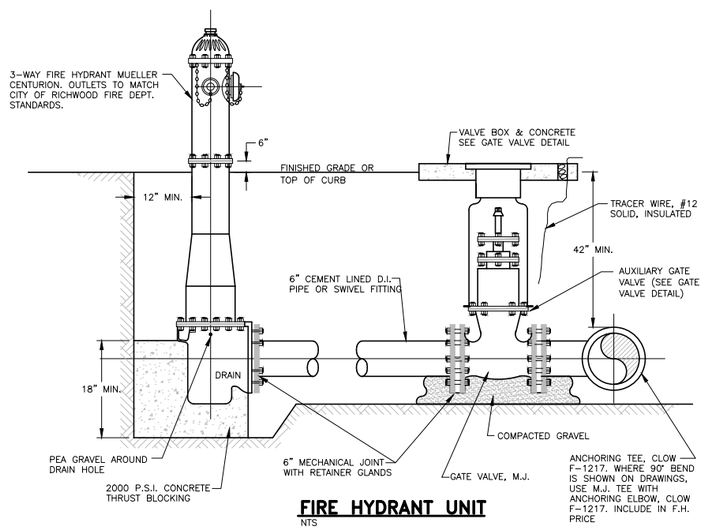
VALVE MARKER
NTS

WATER LINE MARKER
NTS

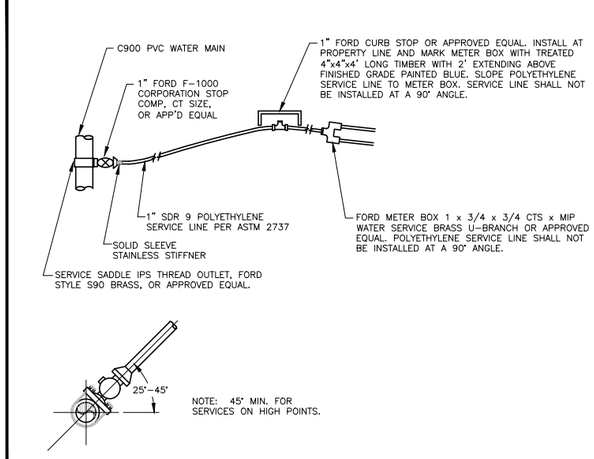
NOTE: VALVE AND WATER LINE MARKERS ARE TO BE INSTALLED AT LOCATIONS AS SHOWN ON DRAWINGS. WATER LINE MARKER IS TO BE INSTALLED NEAR THE R.O.W. LINE AT ROAD CROSSINGS.



BLOCKING DETAIL FOR VALVES ON PLASTIC PIPE
NTS



FIRE HYDRANT UNIT
NTS



DUCTILE IRON OR PVC PIPE
SERVICE CONNECTION
NTS

NO.	REVISIONS	DATE:

WATER DETAILS

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

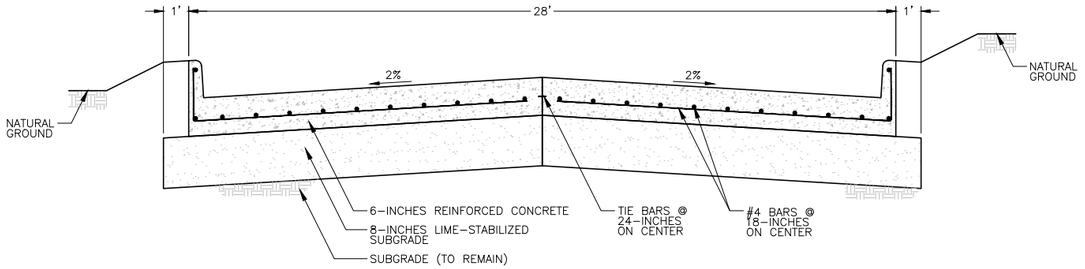
JOB NO. 4570.020

PROJECT MGR. JE

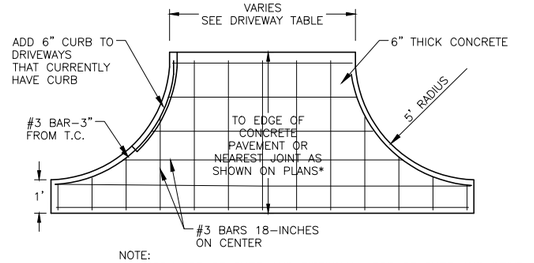
TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 14



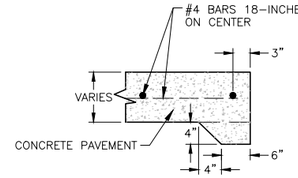
1 REINFORCED CONCRETE WITH CURB AND GUTTER SECTION



NOTE:
MATCH TOP OF CURB AND SIDEWALK. TOP OF CURB AND DRIVE APRON WILL COME TOGETHER AT THE END OF THE CURB RETURN.

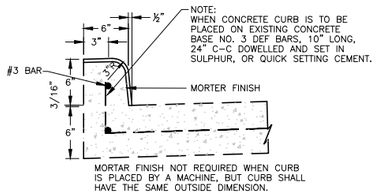
7 STANDARD CONCRETE DRIVE APPROACH

4000 PSI @ 28 DAYS
*UNLESS LENGTH IS OTHERWISE SHOWN ON DRAWINGS

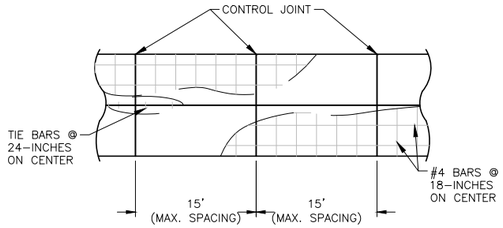


10 STANDARD CONCRETE PAVEMENT HEADER

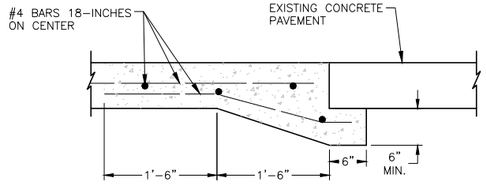
(FOR USE AT END OF ANY CONCRETE PAVEMENT WHICH DOES NOT TIE TO CONCRETE)



2 CONCRETE CURB

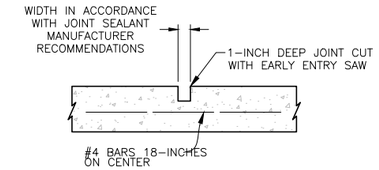


5 CONTROL JOINT LOCATIONS ON CONCRETE PAVEMENTS



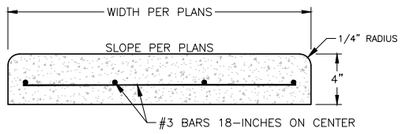
8 UNDERCUT DETAIL

(USE FOR NEW CONCRETE PAVEMENT TIE TO EXISTING CONC. PAVEMENT)

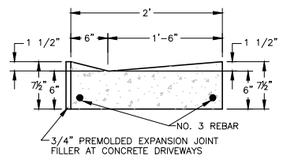


11 CONTROL JOINT DETAIL

DUMMY GROOVE CONTRACTION JOINTS TO BE 1" DEEP @ 5' SPACING. EXPANSION JOINTS TO BE 1/2" BITUMINOUS JOINT FILLER @ 25' SPACING. SEAL EXP. JOINT WITH 1/2" THICK JOINT SEALER. FINISHED GRADE ADJACENT TO SIDEWALK TO BE 0.1" BELOW CONCRETE.

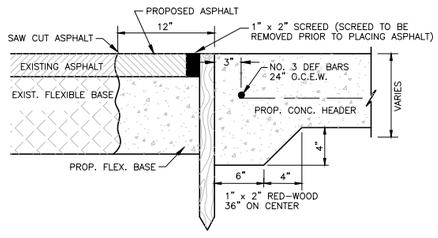


3 CONCRETE SIDEWALK



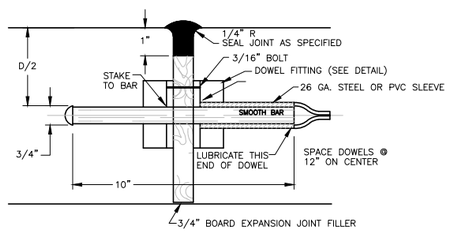
4 GUTTER AT DRIVE

(WHEN DRIVEWAY LOCATIONS ARE KNOWN WHEN CURB AND GUTTER IS INSTALLED)

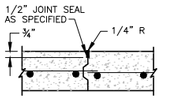


6 PAVING HEADER

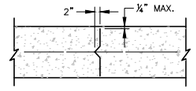
(FOR USE IN CONNECTING CONC. PAVEMENT TO ASPHALT PAVEMENT)



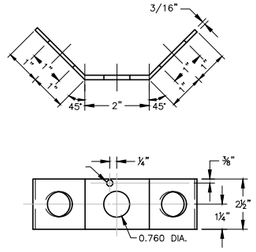
9 DOWEL TYPE EXPANSION JOINT IN CONCRETE PAVEMENT



12 CONSTRUCTION JOINT – KEYED



13 DEFORMED METAL STRIP CONTRACTION JOINT



14 DOWEL FITTING

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NO.	REVISIONS	DATE:

PAVING DETAILS

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 15

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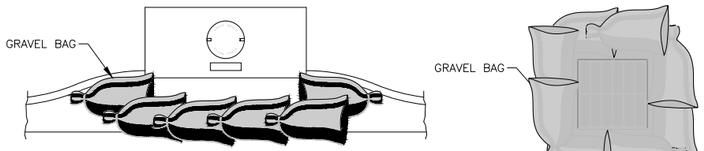
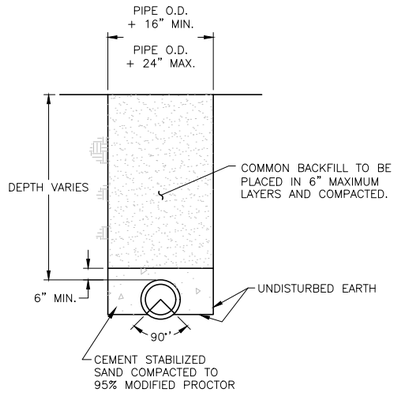


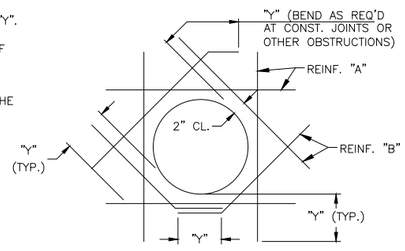
NOTE:
TEMPORARY DEVICES AROUND STORM DRAINS ARE USED TO DETAIN AND/OR FILTER SEDIMENT-LADEN RUNOFF. THE PROTECTION ALLOWS SEDIMENT TO SETTLE PRIOR TO DISCHARGE INTO A STORM DRAIN INLET OR CATCH BASIN. GRAVEL BAGS SHALL BE UV RESISTANT AND MUST NOT DEGRADE DUE TO ATMOSPHERIC CONDITIONS. GRAVEL BAGS SHALL BE REPLACED UPON FIRST SIGN OF DETERIORATION.

1 STORM DRAIN INLET PROTECTION
NTS



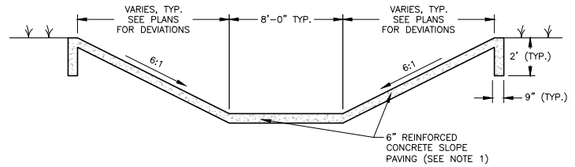
2 CONCRETE, CORRUGATED STEEL OR PVC PIPE BEDDING DETAIL

NOTES:
1. MOVE REINF. MAX. OF 2" TO CLEAR OPENING, CUT REMAINING BAR THROUGH OPENING. WHERE REINF. MUST BE CUT, ADD REINF. "A" AT LEAST EQUAL IN AREA TO THAT WHICH WAS CUT AND EXTEND BEYOND OPENING DISTANCE "Y".
2. DIAGONAL BARS "B" TO BE PLACED:
   A. AT ℄ OF WALL WHERE ONE LAYER OF REINF. IS PROVIDED.
   B. AT TOP & BOTTOM OF ALL SLABS.
3. UNLESS OTHERWISE NOTED, SIZE OF REINF. "B" SHALL BE THE SIZE OF THE LARGEST REINF. BAR CUT.
4. Y = 1'-1" FOR #4.

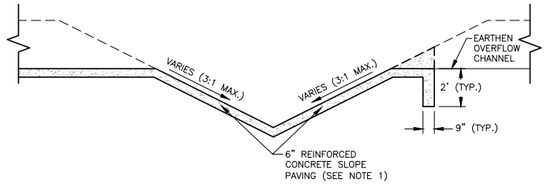


3 REINFORCEMENT AT CONCRETE OPENINGS

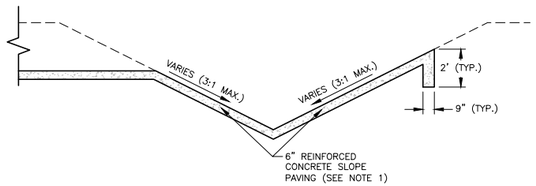
NOTES:
1. MIN. 3500 PSI CONCRETE WITH #5 BARS @ 12" O.C.E.W. TRANSVERSE BARS SHALL BE BENT TO EXTEND DOWN INTO TOE WALLS. 3-LONGITUDINAL BARS IN TOE WALLS TO BE PLACED @ 12" MAX. SPACING.)
2. CONSTRUCTION JOINTS OR GROOVED JOINTS SHALL EXTEND ACROSS THE ENTIRE BOTTOM WIDTH AND EXTEND THE FULL SLANT SLOPE HEIGHT TO THE TOP OF BANK. JOINTS SHALL BE AT INTERVALS OF APPROXIMATELY 15 FEET UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. THE OUTSIDE EDGE OF THE CONCRETE SLOPE PAVING SHALL CONFORM TO THE EXISTING NATURAL GROUND OR PROPOSED CONTOURS.



SECTION VIEW – NORTH/SOUTH



SECTION VIEW – EAST/WEST (4 OAKS ST.)



SECTION VIEW – EAST/WEST (QUAIL RUN ST.)

4 REINFORCED CONCRETE SLOPE PAVING

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NO.	REVISIONS	DATE:

DRAINAGE DETAILS

CITY OF RICHWOOD
CDBG-MIT MOD PAVING, DRAINAGE, AND WATER IMPROVEMENTS

JOB NO. 4570.020
PROJECT MGR. JE
TBPE No. F-8405

STRAND ASSOCIATES®

SHEET 16

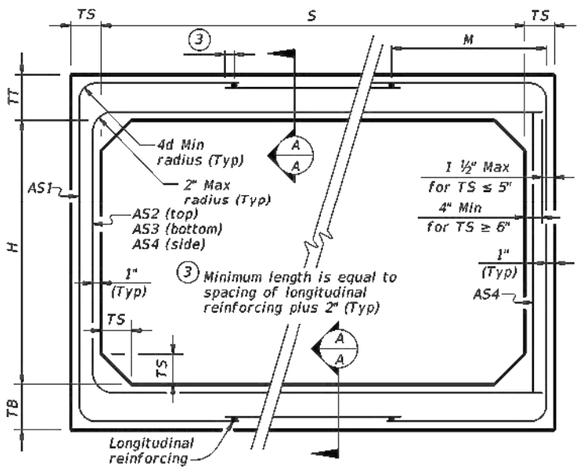
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) (2)							(1) Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
4	2	7.5	6	5	< 2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.14	4.5
4	2	5	5	5	2 < 3	38	0.18	0.19	0.17	0.12	-	-	-	3.6
4	2	5	5	5	3 - 5	38	0.13	0.13	0.13	0.12	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	3.6
4	3	7.5	6	5	< 2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.14	5.0
4	3	5	5	5	2 < 3	38	0.15	0.23	0.20	0.12	-	-	-	4.1
4	3	5	5	5	3 - 5	38	0.12	0.16	0.16	0.12	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	4.1
4	4	7.5	6	5	< 2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.14	5.5
4	4	5	5	5	2 < 3	38	0.12	0.26	0.23	0.12	-	-	-	4.6
4	4	5	5	5	3 - 5	38	0.12	0.18	0.18	0.12	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	4.6

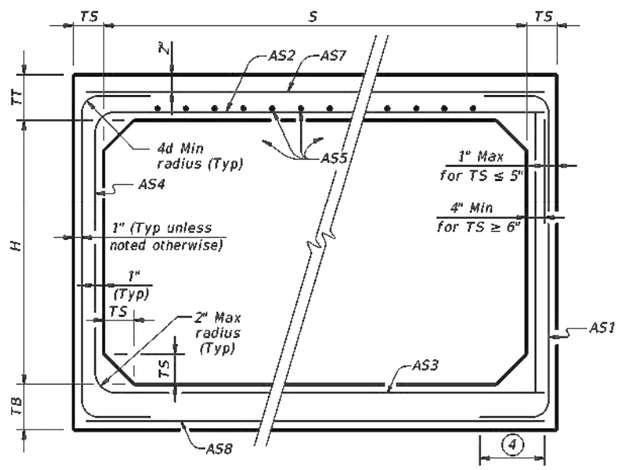
(1) For box length = 8'-0"

(2) AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

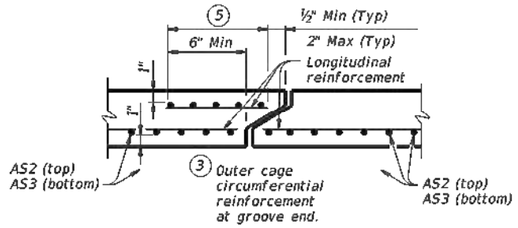
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

(4) Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.

Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.

See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS PRECAST

4'-0" SPAN

SCP-4

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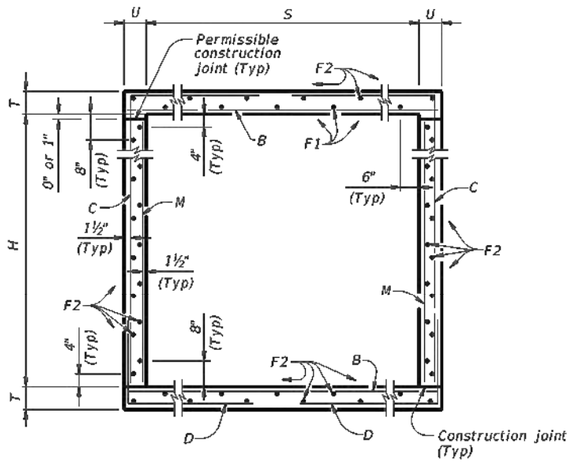
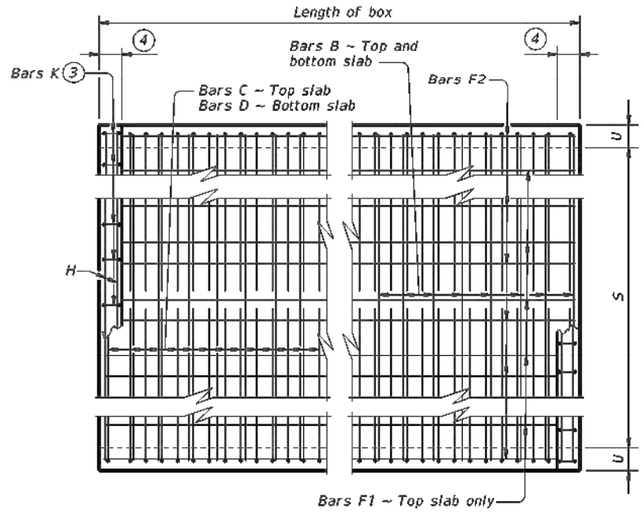
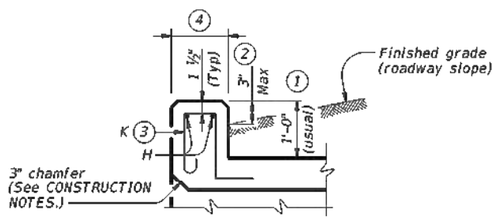


TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB

(1) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

(2) For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(3) For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

(4) 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

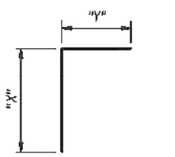
CONSTRUCTION NOTES:
Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

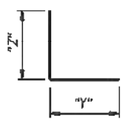
Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

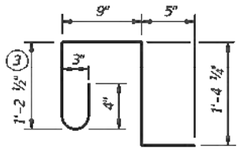
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE
0' TO 30' FILL

SCC-3 & 4

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SECTION DIMENSIONS				FILL HEIGHT (5)	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																												QUANTITIES					
					Bars B					Bars C							Bars D							Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
S	H	T	U		No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
3' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	5' - 4"	385	2' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	19	39' - 9"	505	3' - 11"	10	10	28	0.292	48.1	0.3	38	12.0	1,960
3' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	3' - 11"	441	108	#4	9"	6' - 4"	457	3' - 6"	2' - 10"	108	#4	9"	5' - 1"	367	2' - 10"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	23	39' - 9"	611	3' - 11"	10	10	28	0.335	54.3	0.3	38	13.7	2,210
4' - 0"	2' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	5' - 8"	613	2' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	2' - 0"	144	3	39' - 9"	80	21	39' - 9"	550	4' - 11"	13	12	33	0.342	63.4	0.4	46	14.1	2,581
4' - 0"	3' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	6' - 8"	721	3' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	3' - 0"	216	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.385	70.5	0.4	46	15.8	2,867
4' - 0"	4' - 0"	8"	7"	30'	108	#5	9"	4' - 11"	554	162	#4	6"	7' - 8"	830	4' - 6"	3' - 2"	162	#4	6"	5' - 5"	586	3' - 2"	2' - 3"	108	9"	4' - 0"	289	3	39' - 9"	80	25	39' - 9"	664	4' - 11"	13	12	33	0.428	75.1	0.4	46	17.5	3,049

(5) For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL

SCC-3 & 4

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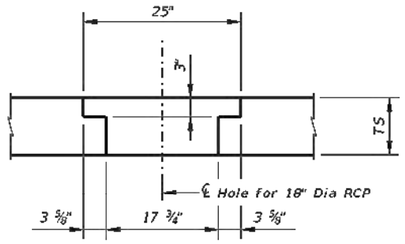
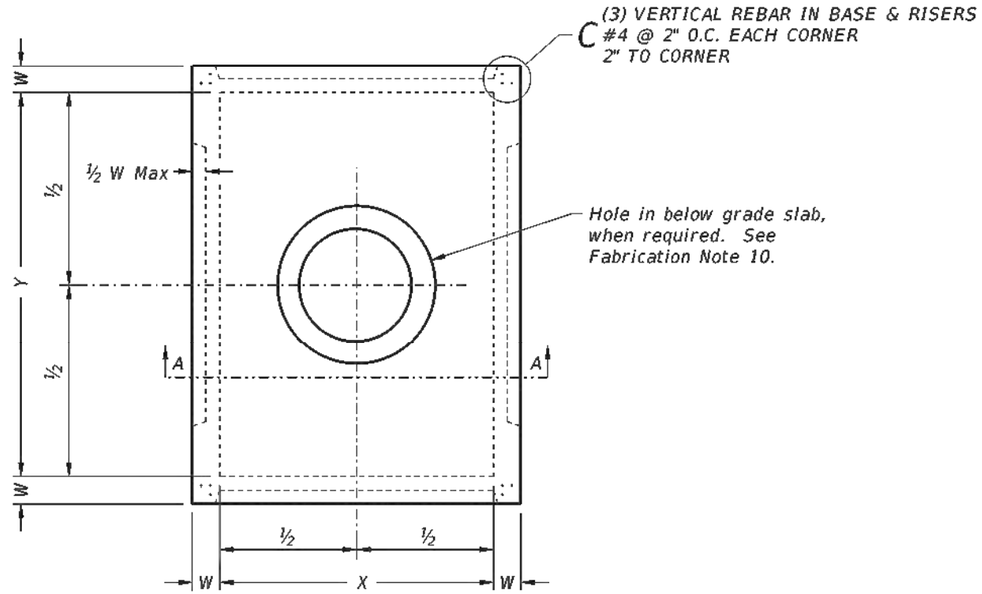
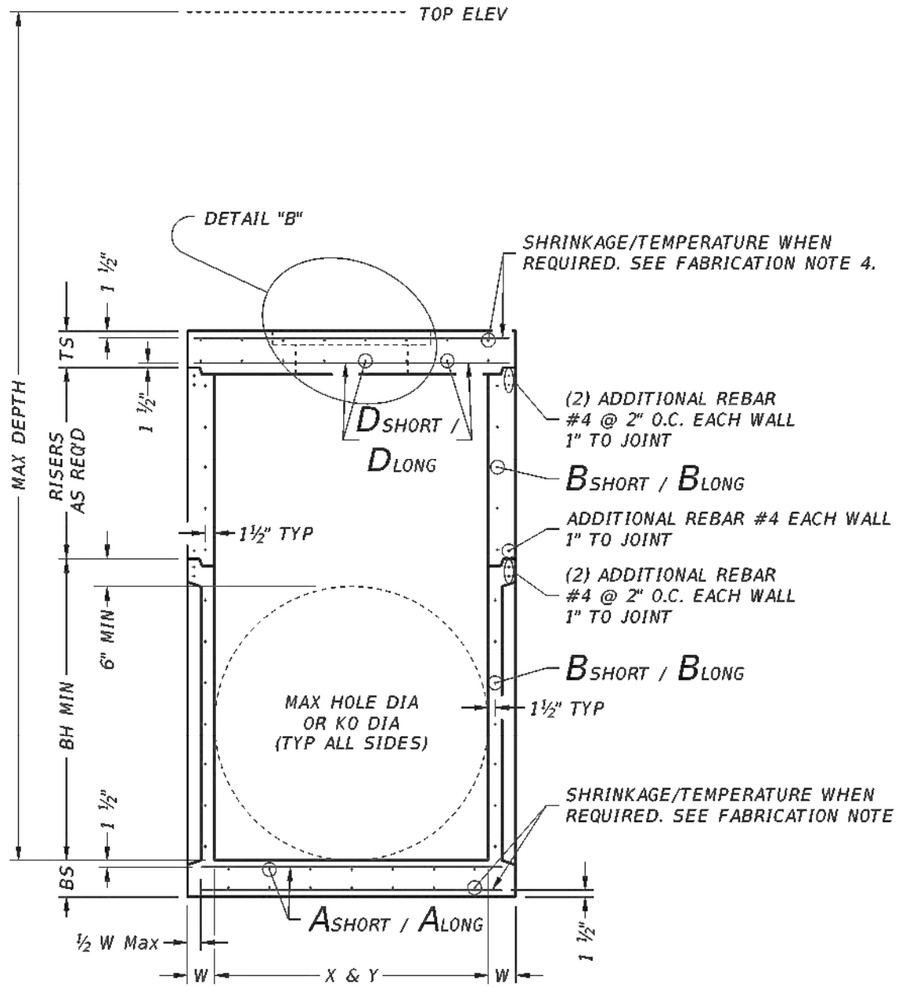


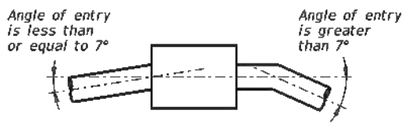
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall.
If necessary, use pipe elbow or curved approach alignment to stay within this limit.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide typical clear cover of 1 ½" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST JUNCTION BOX

PJB

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	Size	MAX DEPTH = 15 ft. to top of BASE SLAB										MAX DEPTH = 25 ft. to top of BASE SLAB										Min Height (See Gen Note 3)	Max HOLE DIA (See Fab Note 2)	Max KO DIA (See Fab Note 2)
		Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)				Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						
		Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness	Reduced Riser Size	Short Span Reinf Steel Area	Long Span Reinf Steel Area	Thickness			
	X x Y	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	Ashort	Along	BS	Bshort	Blong	W	RWSxRWL or ID	Dshort	Dlong	TS	BH MIN	HOLE DIA	KO DIA
	ft.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	in^2/ft	in^2/ft	in.	ft. **	in^2/ft	in^2/ft	in.	ft.	in.	in.
Precast Junction Box (PJB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	0.37	0.37	9	0.29	0.29	6	0.24	0.24	6	N/A	0.37	0.37	9	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60
	5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72
	6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72
	8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72
Precast Base (PB)	3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36
	4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48
	3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60
	4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60
	5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60
	5x5	0.38	0.38	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60
	5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60
	5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72
	5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72
	5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72
	6x6	0.29	0.29	9	0.45	0.45	6	3x3	0.41	0.41	9	0.52	0.52	9	0.54	0.54	8	3x3	0.74	0.74	9	6.5	72	72
	6x6	0.27	0.27	9	0.45	0.45	6	4x4	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72
	6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72
	8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72

** Unless otherwise indicated.

FABRICATION NOTES:
1. Maximum spacing of reinforcement is 8".
2. At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.

GENERAL NOTES:
1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
2. Precast Base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
3. Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-6".

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DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

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Size (Y)	N	MH Dia (2)
3'	9"	18"
4'	16"	32"
5'	16"	32"
6'	16"	32"

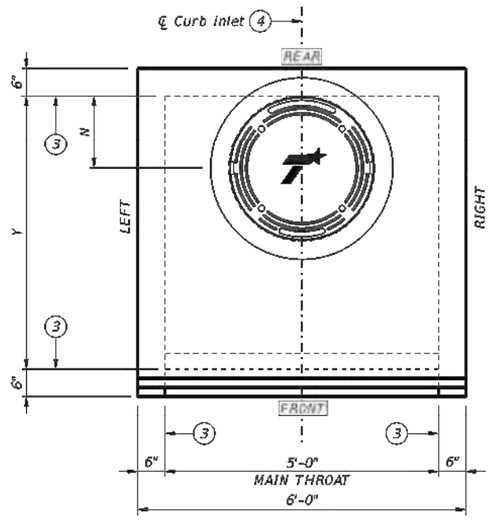
BAR TABLE	
BAR	SIZE
A1	#3
A2	#3
A3 (1)	#3
A4 (1)	#3
B1	#4
B2	#4
B3 (1)	#4
C (1)	#4
G	#4
L (1)	#5
Ra	#5
U1 (1)	#5
U2 (1)	#5

(1) Reinforcing bar used only with extension(s).

(2) Nominal ring and cover size.

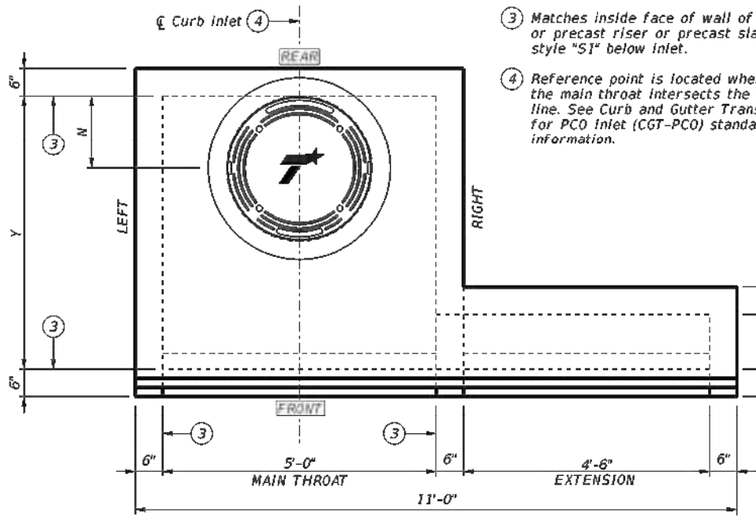
(3) Matches inside face of wall of precast base or precast riser or precast slab lid (PSL) style "S1" below inlet.

(4) Reference point is located where the ℄ of the main throat intersects the normal gutter line. See Curb and Gutter Transition Details for PCO Inlet (CGT-PCO) standard for more information.



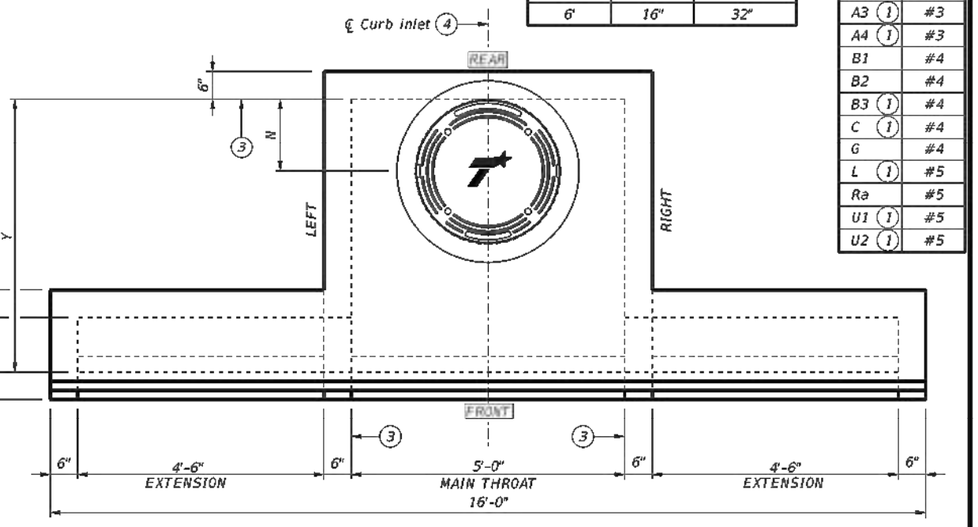
PLAN VIEW

(Shown without extensions.)
See SHEET 2 OF 4 for details.



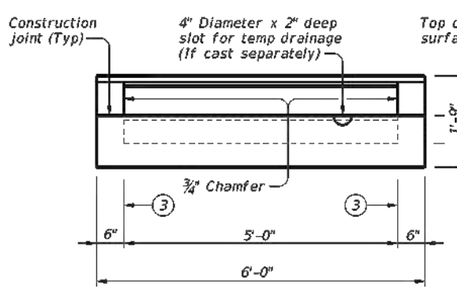
PLAN VIEW

(Showing one extension.)
See SHEET 3 OF 4 for details.



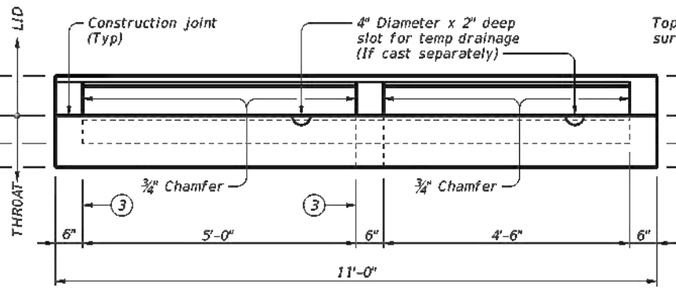
PLAN VIEW

(Showing extension on each side)
See SHEET 4 OF 4 for details.



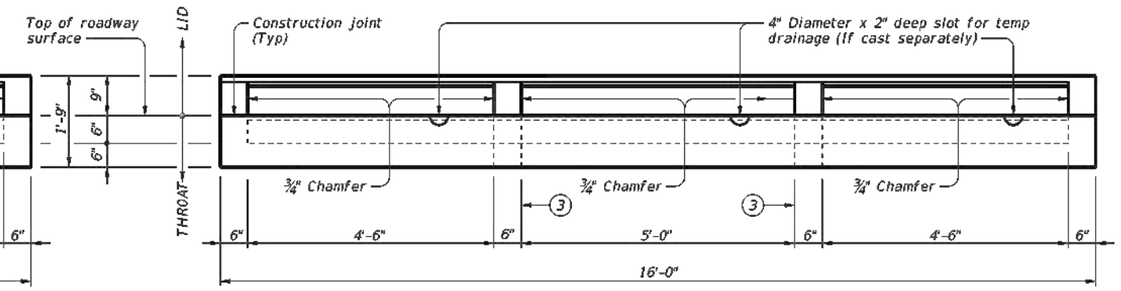
FRONT VIEW

(Shown without extensions.)
See SHEET 2 OF 4 for details.



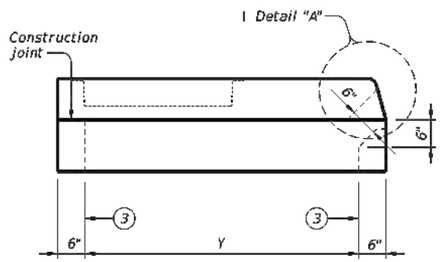
FRONT VIEW

(Showing one extension.)
See SHEET 3 OF 4 for details.



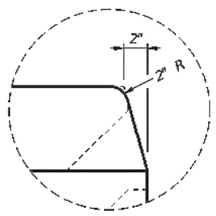
FRONT VIEW

(Showing extension on each side.)
See SHEET 4 OF 4 for details.



LEFT SIDE VIEW

(Extensions not shown for clarity.)



DETAIL "A"

CONSTRUCTION NOTES:

Chamfer all vertical edges of inlet lid ¾" as shown in Front View, Sheet 1 of 4.
Maintain 1 ½" clear cover to ends of all vertical reinforcing bars, unless otherwise noted.

MATERIAL NOTES:

Provide Class "S" concrete (f'c = 4,000 psi).
Provide Grade 60 reinforcing steel or equivalent area of WWR.
Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
The intent of this standard is to provide a cast-in-place lid to be used with precast base, precast riser or precast slab lid style "S1".
Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
Lid and throat may be cast monolithically or separately.
See Precast Base (PB) standard for details and notes not shown.
See Precast Slab Lid (PSL) standard for details and notes not shown.
See Curb & Gutter Transitions Details (CGT-PCO) standard for transition examples.
Extensions may be right, left, both, or none. Provide extensions as specified elsewhere in the plans.
Shop drawings for approval are not required.
Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.
Open area of main throat = 360 sq in.
Open area of one extension throat = 324 sq in.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

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CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

CCO

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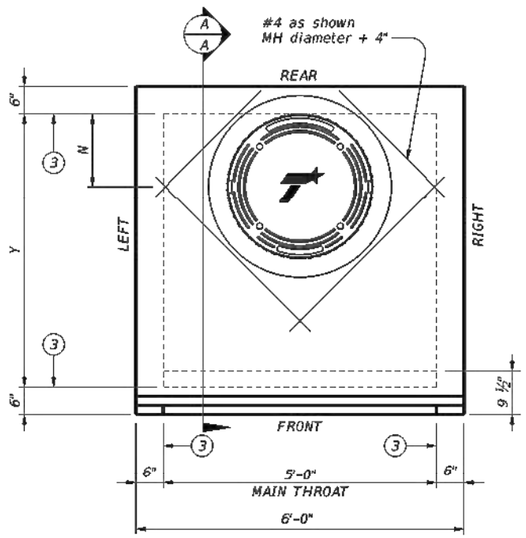
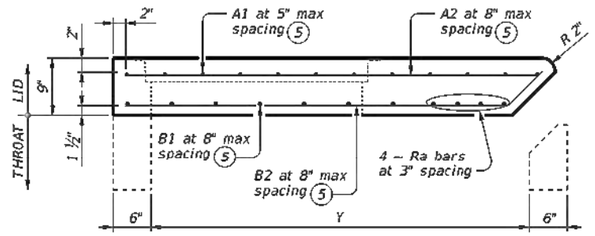
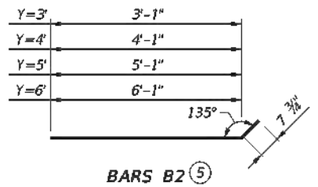


LID PLAN VIEW

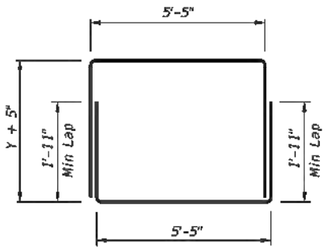
(Shown without extensions)



LID SECTION A-A

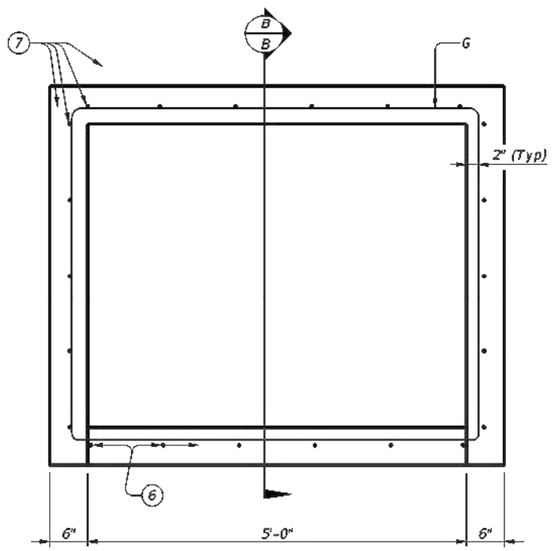


BARS B2 (5)



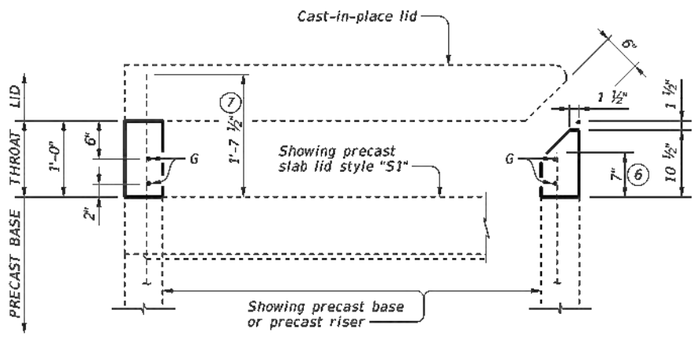
BARS G

Showing one complete bar.



THROAT PLAN VIEW

(Shown without extensions)



THROAT SECTION B-B

(Showing reinforcing bar extended from precast base or precast riser or precast slab lid style "S1".)

(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(5) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(7) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 ½".

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Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

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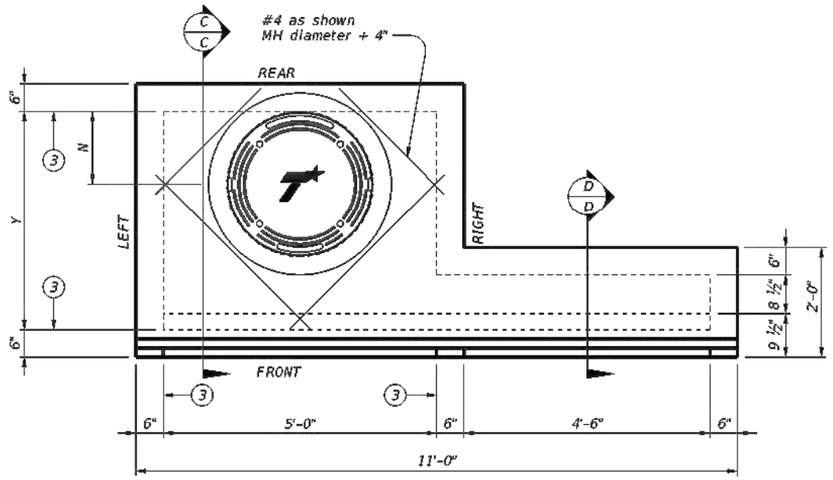
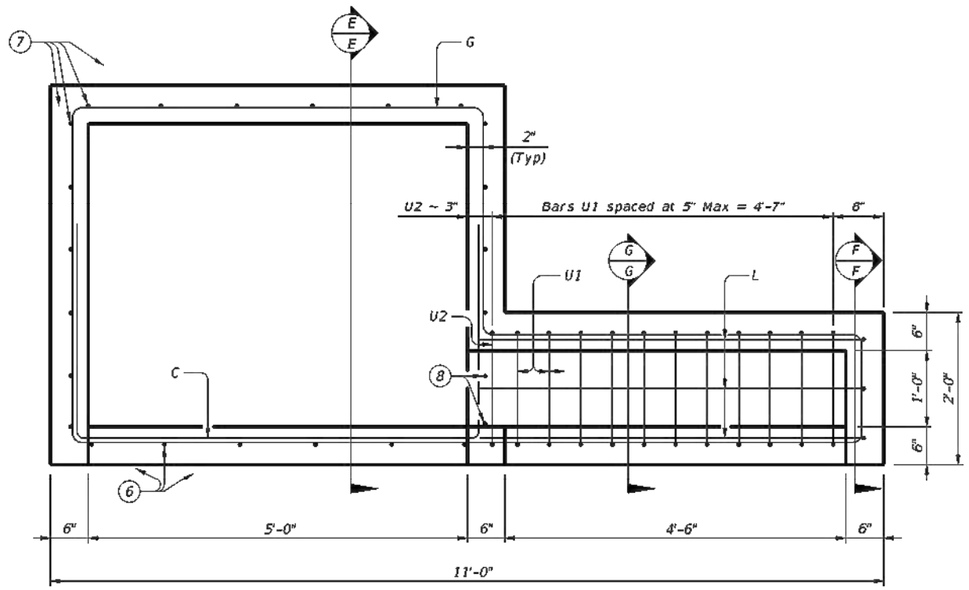


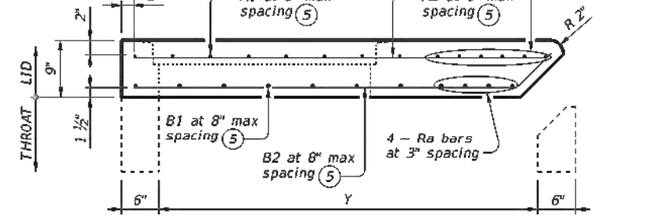
LID PLAN VIEW

(Showing one extension.)

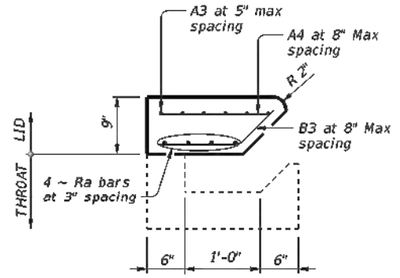


THROAT PLAN VIEW

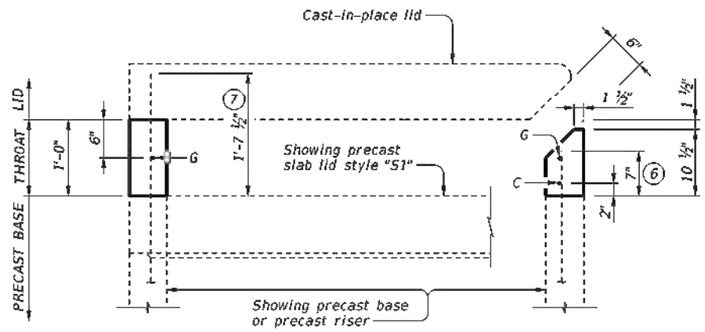
(Showing one extension.)



LID SECTION C-C

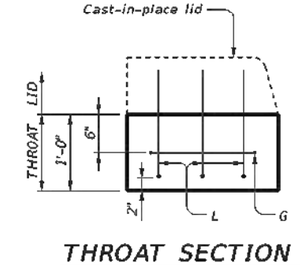


LID SECTION D-D

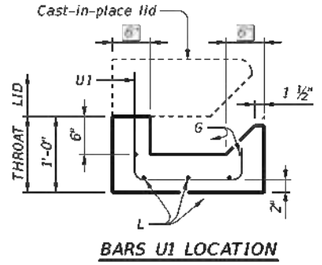


THROAT SECTION E-E

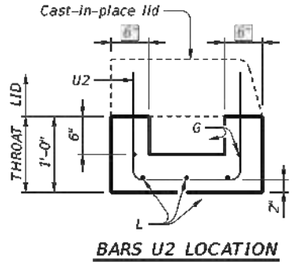
(Showing reinforcing bar extended from precast base or precast riser or precast slab lid style "S1".)



THROAT SECTION F-F

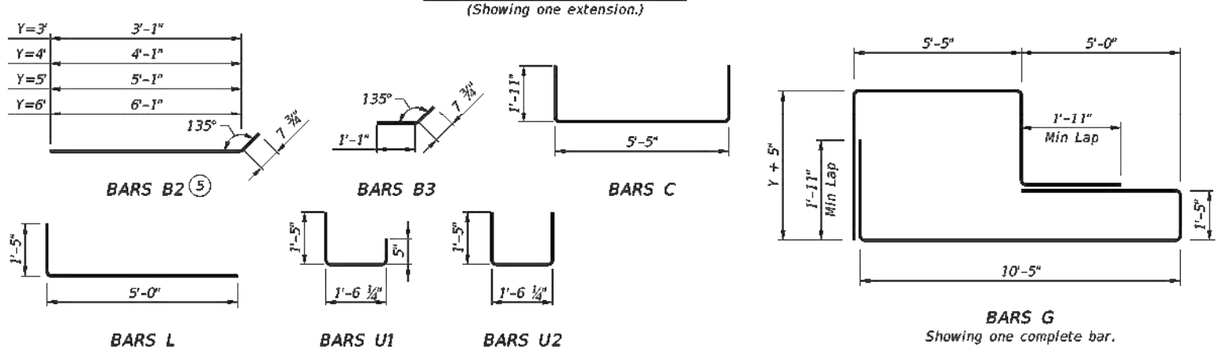


BARS U1 LOCATION



BARS U2 LOCATION

THROAT SECTION G-G



(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(5) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(7) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 ½".

(8) Do not extend reinforcing bars from precast base.

HL93 LOADING

SHEET 3 OF 4

Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

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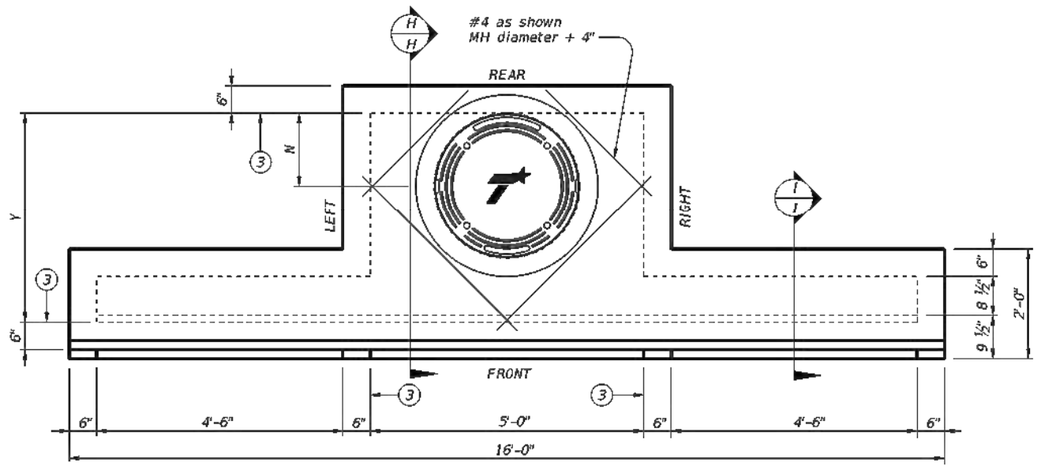
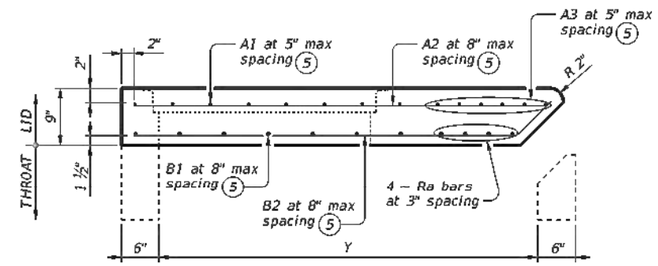
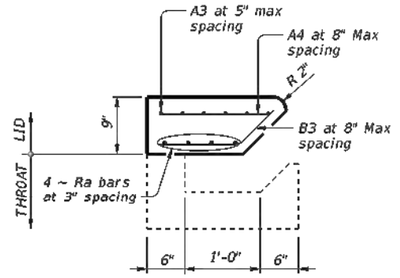


LID PLAN VIEW

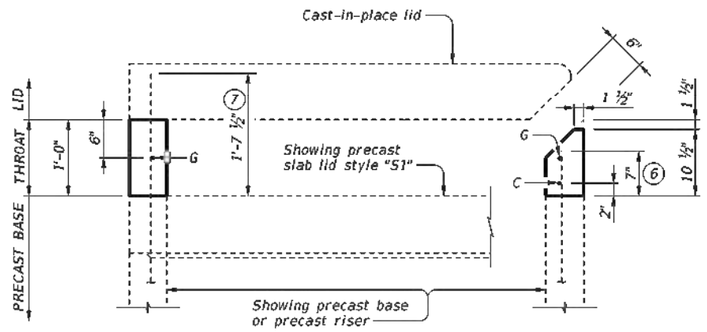
(Showing extension on each side.)



LID SECTION H-H

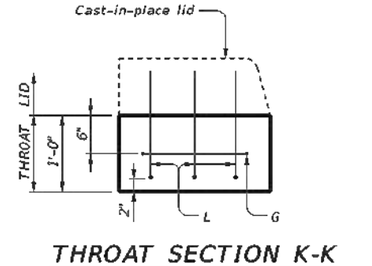


LID SECTION I-I

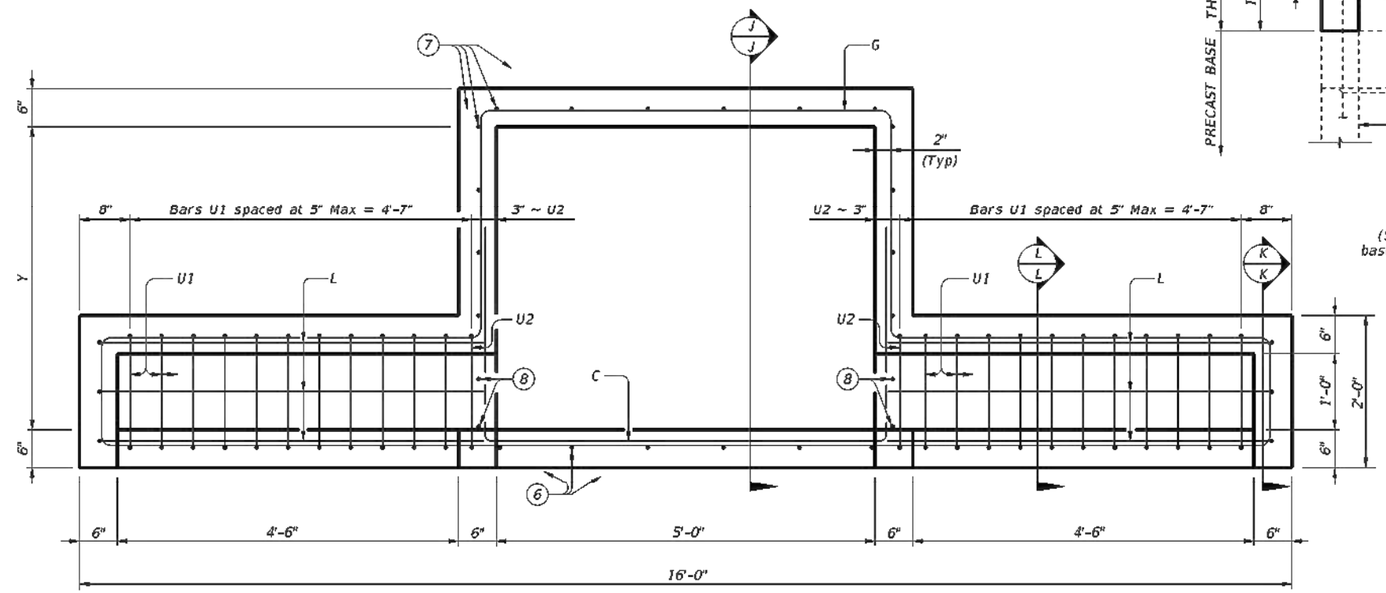


THROAT SECTION J-J

(Showing reinforcing bar extended from precast base or precast riser or precast slab lid style "S1".)

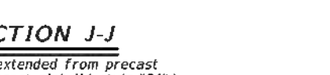


THROAT SECTION K-K

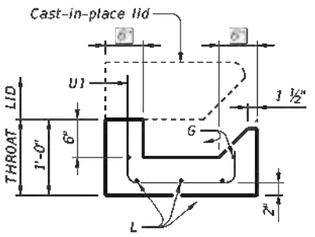


THROAT PLAN VIEW

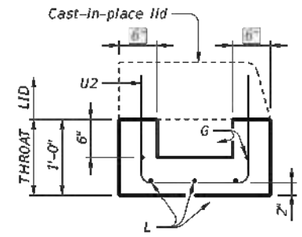
(Showing extension on each side.)



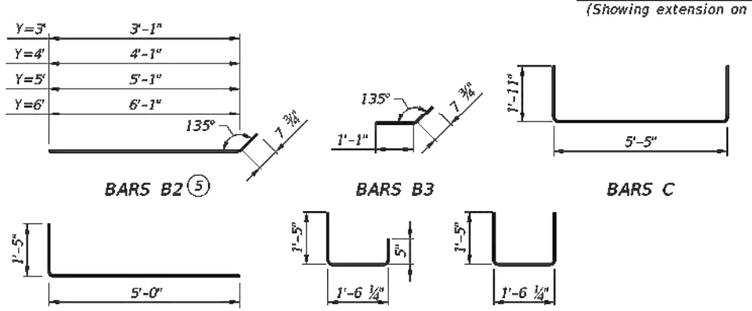
THROAT SECTION L-L



BARS U1 LOCATION



BARS U2 LOCATION



BARS B2 (5)

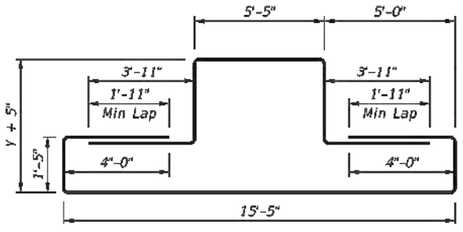
BARS B3

BARS C

BARS L

BARS U1

BARS U2



BARS G

Showing one complete bar.

(3) Matches inside face of wall of precast base or precast riser or precast slab lid style "S1" below inlet.

(5) Cut reinforcing bars as needed to provide 1 ½" clear to manhole.

(6) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 7".

(7) Extend reinforcing bars from precast base or precast riser or precast slab lid style "S1" 1'-7 ½".

(8) Do not extend reinforcing bars from precast base.

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Texas Department of Transportation

Bridge Division Standard

CAST-IN-PLACE CURB INLET OUTSIDE ROADWAY

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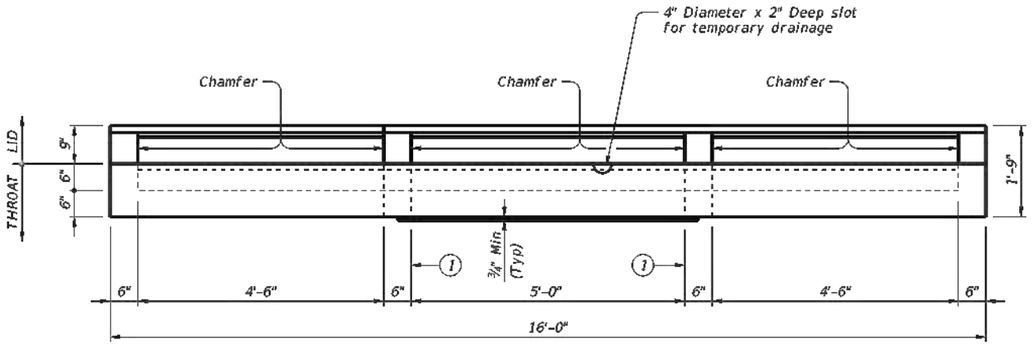
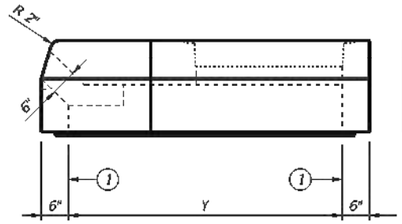
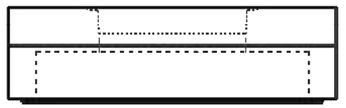


FRONT VIEW

(Showning left and right extensions)

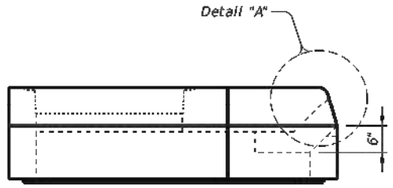


RIGHT VIEW

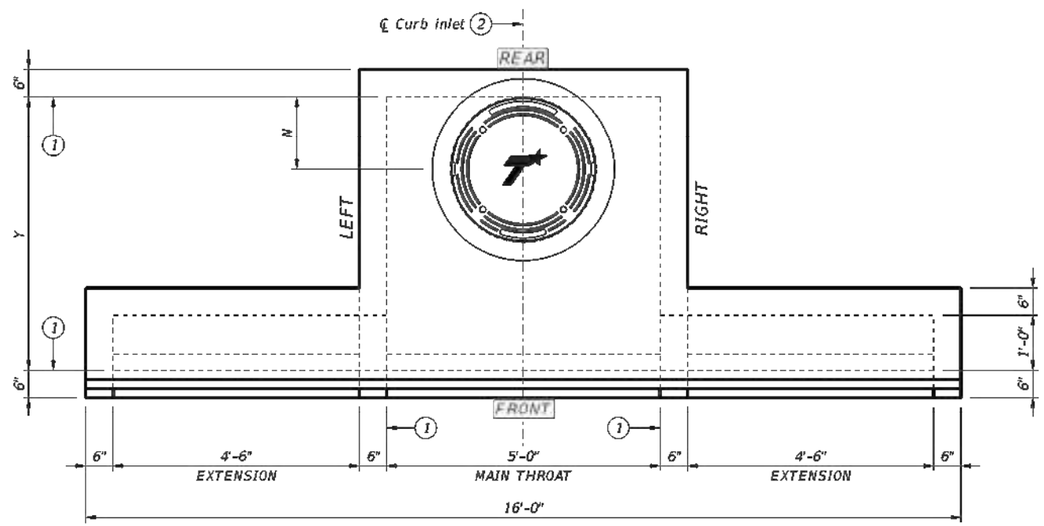


REAR VIEW

(Extensions not shown)



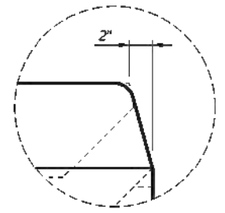
LEFT VIEW



PLAN VIEW

(Showning left and right extensions)

1. Matches inside face of wall of precast base or riser below inlet.
2. Reference point is located where the ℄ of the main throat intersects the normal gutter line. See Curb and Gutter Transition Details for PCO Inlet (CGT-PCO) standard for more information.



DETAIL "A"

HS20 LOADING

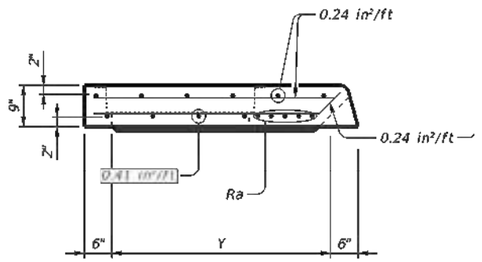
Texas Department of Transportation

Bridge Division Standard

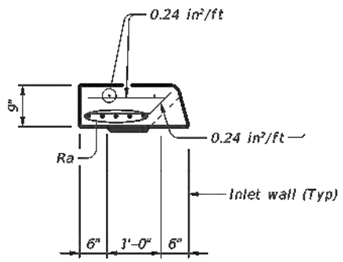
PRECAST CURB INLET OUTSIDE ROADWAY

PCO

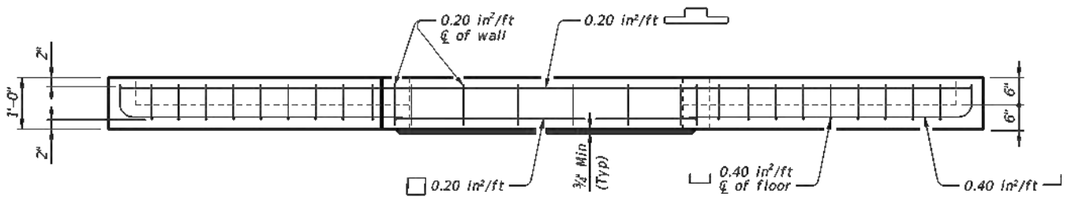
FILE: CD-PCO-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
06-2023: Added reference point.	DIST	COUNTY		SHEET NO.	
				26	



LID SECTION A-A

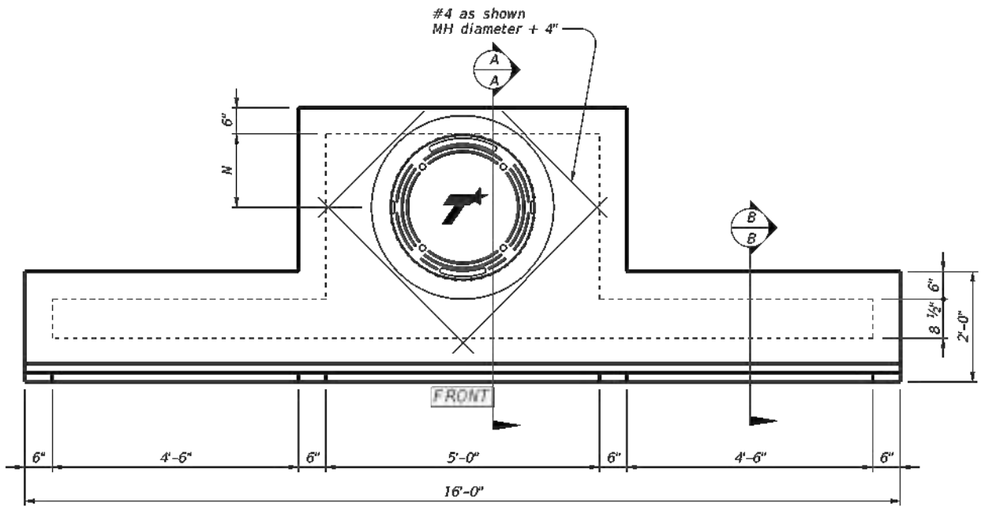


LID SECTION B-B



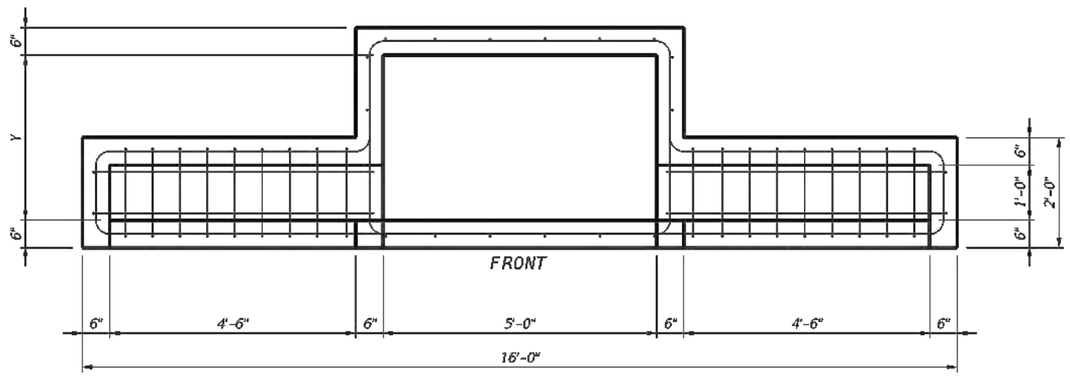
THROAT ELEVATION VIEW

(Showning left and right extensions)



LID PLAN VIEW

(Showning left and right extensions)



THROAT PLAN VIEW

(Showning left and right extensions)

Size (Y)	N	MH Dia*	Ra
3'	9"	18"	(4) #5 Additional
4'	16"	32"	(4) #5 Additional
5'	16"	32"	(4) #5 Additional
6'	16"	32"	(4) #5 Additional

*Nominal ring and cover size.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Extensions may be right, left, both or none. Provide extensions as specified elsewhere in the plans.
4. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾". Lid may employ a butt joint with dowels at the Contractor's option.
5. Provide lifting devices in conformance with Manufacturer's recommendations.
6. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.
7. Chamfer vertical edges of inlet lid ¾" as shown in Front View, sheet 1.

INSTALLATION NOTES:

1. Inlet throat and lid are not intended for direct traffic. Do not place in roadway.
2. Seal tongue and groove joints and butt joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Open area of main throat = 360 sq in. Open area of one extension throat = 324 sq in.
3. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, size, and extension placement. Extensions are subsidiary to inlet.

Cover dimensions are clear dimensions, unless noted otherwise.

HS20 LOADING

Texas Department of Transportation

Bridge Division Standard

PRECAST CURB INLET OUTSIDE ROADWAY

PCO

FILE: CD-PCO-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
06-2023: Added reference point.	DIST	COUNTY		SHEET NO.
				27

DATE:
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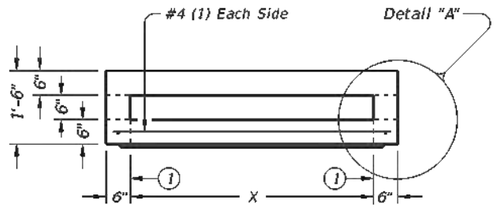
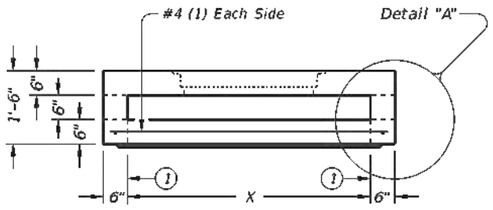
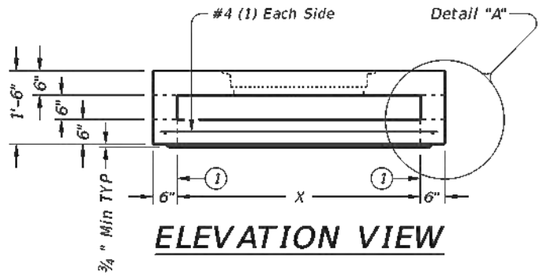


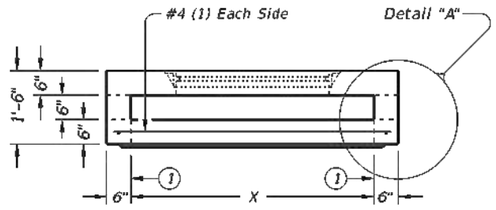
ELEVATION VIEW



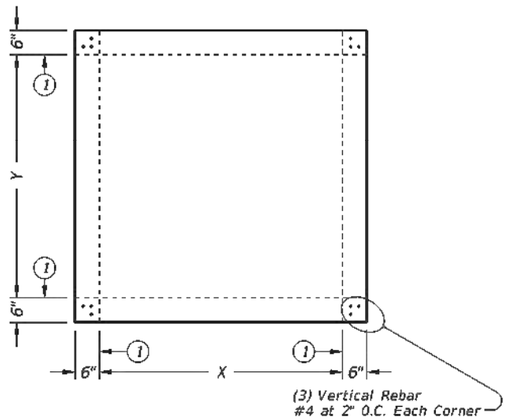
ELEVATION VIEW



ELEVATION VIEW



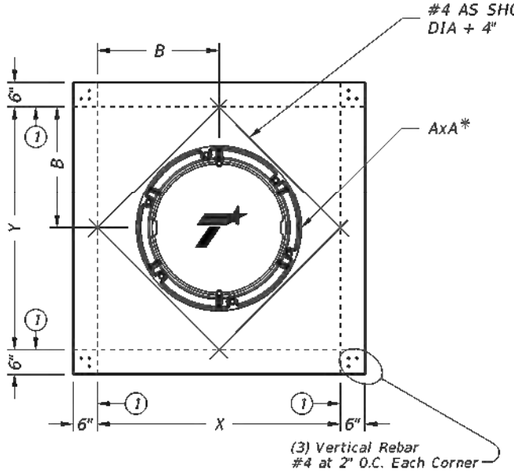
ELEVATION VIEW



PLAN VIEW

NO OPENINGS

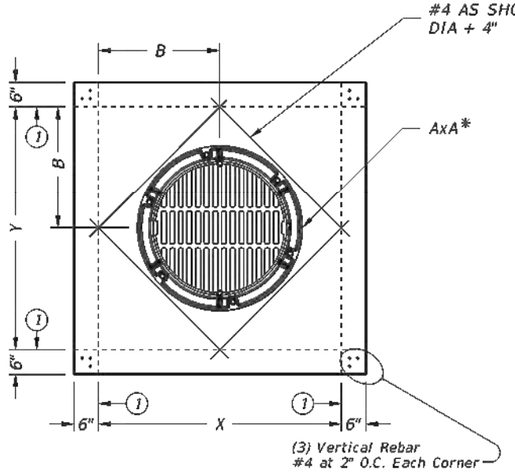
STYLE 'SL'



PLAN VIEW

32" DIA CAST-IN RING & COVER

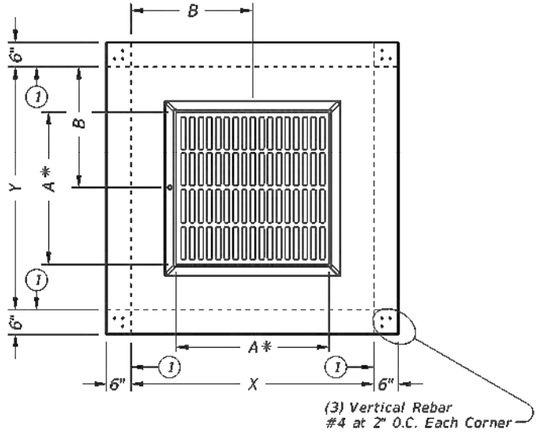
STYLE 'RC'



PLAN VIEW

32" DIA CAST-IN RING & GRATE

STYLE 'RG'



PLAN VIEW

CAST-IN FRAME & GRATE

STYLE 'FG'

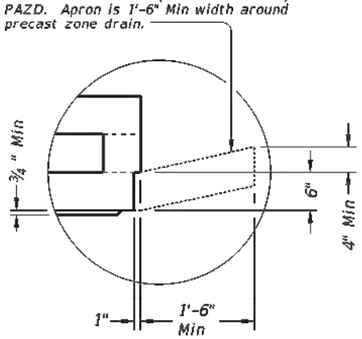
(1) Matches inside face of wall of precast base or riser below inlet.

FABRICATION NOTES:
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of WWR.
3. Provide clear cover of ¾" to reinforcing from bottom of slab for structural reinforcement. Place short span reinforcing closest to surface.
4. No substitution is allowed for diagonal #4 bars around openings.
5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
6. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:
1. PAZD is for use in ditches and medians outside of the horizontal clearance (clear zone). Precast Area Zone Drain is not intended for direct traffic and may not be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.

GENERAL NOTES:
1. Designed according to ASTM C913.
2. Payment for inlet is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Construct cast-in-place reinforced concrete apron when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PAZD. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PAZD, use detail above to create an apron ledge on all 4 sides.

Style	Size (X x Y)	A x A*	B x B	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	n/a	n/a	0.37 in²/ft	0.37 in²/ft
RC,RG	3'x3'	32" Dia	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
FG	3'x3'	3'x3'	1.5'x1.5'	0.37 in²/ft	0.37 in²/ft
SL	4'x4'	n/a	n/a	0.34 in²/ft	0.34 in²/ft
RC,RG	4'x4'	32" Dia	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	3'x3'	2'x2'	0.34 in²/ft	0.34 in²/ft
FG	4'x4'	4'x4'	2'x2'	0.34 in²/ft	0.34 in²/ft
SL	5'x5'	n/a	n/a	0.43 in²/ft	0.43 in²/ft
RC,RG	5'x5'	32" Dia	2.5'x2.5'	0.68 in²/ft	0.68 in²/ft
FG	5'x5'	3'x3'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft
FG	5'x5'	4'x4'	2.5'x2.5'	0.43 in²/ft	0.43 in²/ft

* Nominal frame/grate or ring/cover size.

Texas Department of Transportation

Bridge Division Standard

PRECAST AREA ZONE DRAIN

PAZD

FILE: CD-PAZD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
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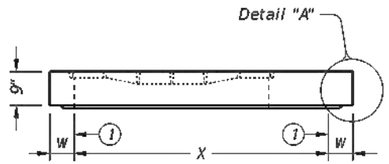
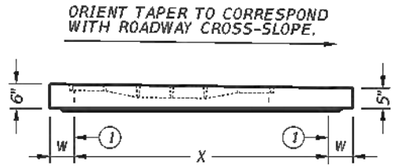
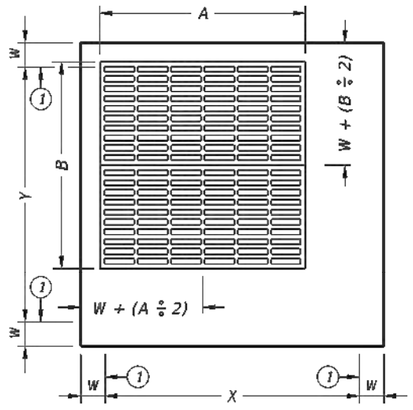


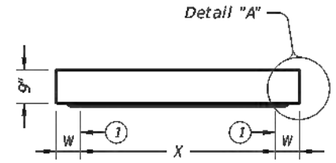
STYLE 'FG'



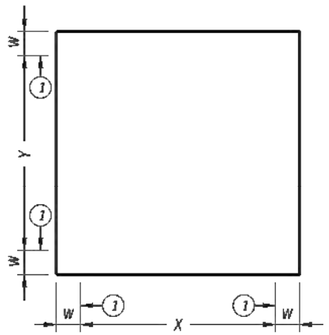
STYLE 'SFG'
ELEVATION VIEW



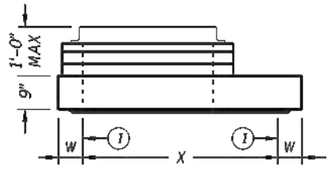
PLAN VIEW
CAST-IN FRAME & GRATE
STYLES 'FG' & 'SFG'



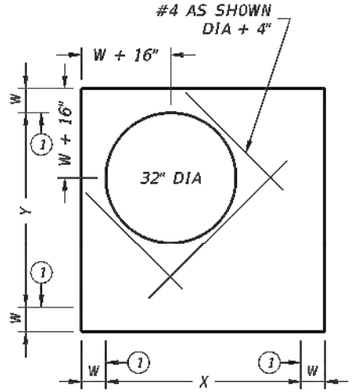
ELEVATION VIEW



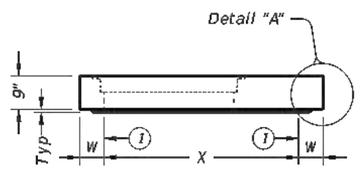
PLAN VIEW
NO OPENINGS
STYLE 'SL'



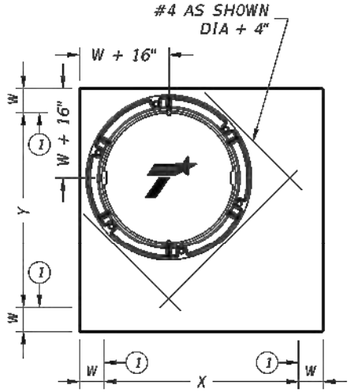
ELEVATION VIEW



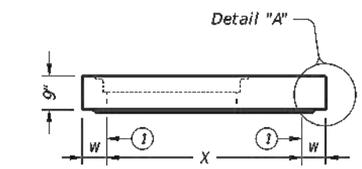
PLAN VIEW
SHIP LOOSE RING & COVER
STYLE 'RH'



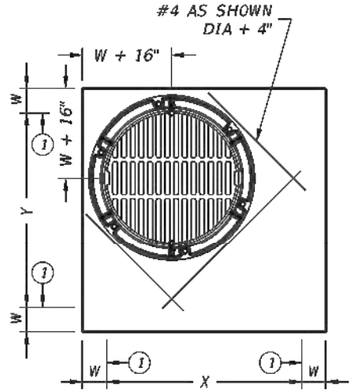
ELEVATION VIEW



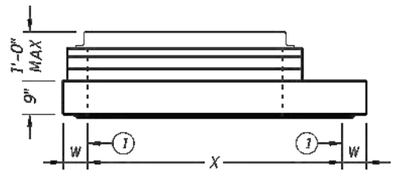
PLAN VIEW
32" DIA CAST-IN RING & COVER
STYLE 'RC'



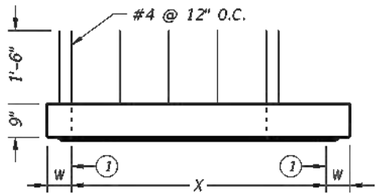
ELEVATION VIEW



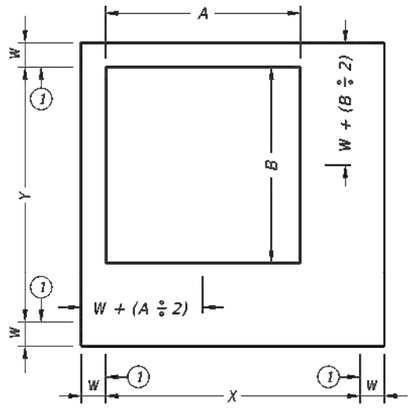
PLAN VIEW
32" DIA CAST-IN RING & GRATE
STYLE 'RG'



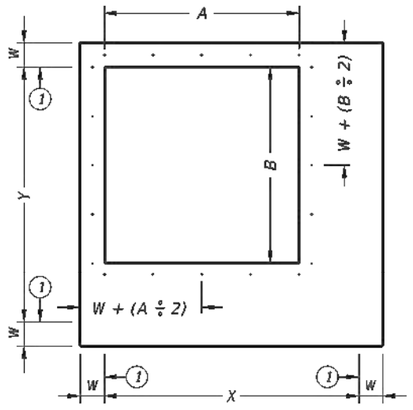
ELEVATION VIEW



ELEVATION VIEW



PLAN VIEW
SHIP LOOSE FRAME & GRATE
STYLE 'SH'



PLAN VIEW
EXPOSED REBAR
STYLE 'S1'

(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation | Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: CD-PSL-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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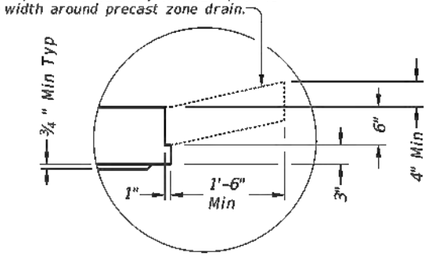
REVISIONS				
	DIST	COUNTY		SHEET NO.
				29

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

PRECAST SLAB LID

PSL

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REVISIONS				
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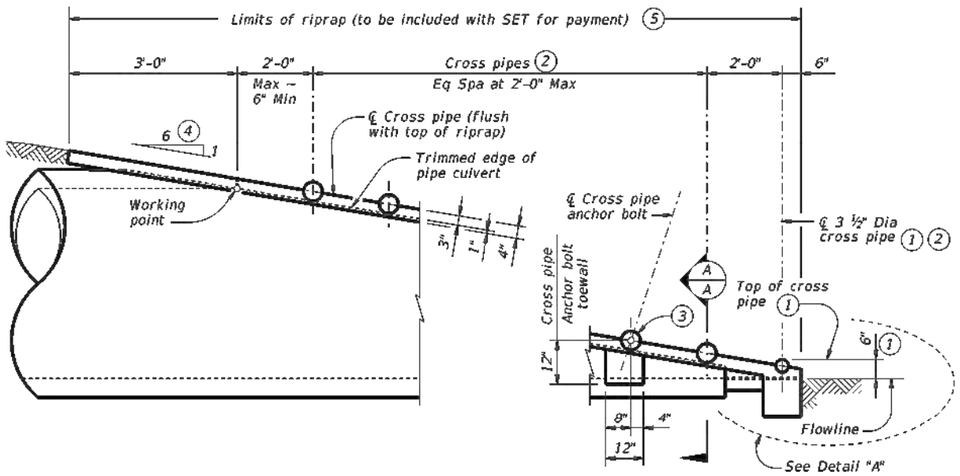


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details of corrugated metal pipe (CMP) culvert are similar. pipe runners not shown for clarity.)

CROSS PIPE LENGTHS AND REQUIRED PIPE SIZES (2)

Corrugated Metal Pipe (CMP) Culverts

Design	Conc Riprap (CY) (6)	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	17"	13"	1' - 0"	N/A	2' - 8"	2' - 5"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	21"	15"	1' - 2"	N/A	3' - 1"	2' - 11"		
3	0.9	28"	20"	1' - 5"	N/A	3' - 9"	3' - 9"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	35"	24"	1' - 8"	4' - 4"	4' - 6"	4' - 7"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	42"	29"	1' - 11"	4' - 11"	5' - 2"	5' - 5"		
6	1.4	49"	33"	2' - 2"	5' - 6"	5' - 11"	6' - 3"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	57"	38"	2' - 5"	6' - 2"	6' - 8"	7' - 2"		
8	1.8	64"	43"	2' - 10"	6' - 9"	7' - 6"	8' - 2"		
9	1.9	71"	47"	3' - 2"	7' - 4"	8' - 3"	9' - 1"		

Reinforced Concrete Pipe (RCP) Culverts

Design	Conc Riprap (CY) (6)	Pipe Culvert Span	Pipe Culvert Rise	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
1	0.6	22"	13 ½"	1' - 0"	N/A	3' - 1"	2' - 10"	3 or more pipe culverts	3" Std (3.500" O.D.)
2	0.7	26"	15 ½"	1' - 2"	N/A	3' - 6"	3' - 4"		
3	0.9	28 ½"	18"	1' - 5"	N/A	3' - 10"	3' - 9 ½"	3 or more pipe culverts	3 ½" Std (4.000" O.D.)
4	1.0	36 ¼"	22 ½"	1' - 8"	4' - 5"	4' - 7"	4' - 8 ¼"	All pipe culverts	4" Std (4.500" O.D.)
5	1.2	43 ¾"	26 ⅝"	1' - 11"	5' - 1"	5' - 4"	5' - 6 ¾"		
6	1.4	51 ⅛"	31 ⅝"	2' - 2"	5' - 8"	6' - 1"	6' - 5 ¼"	All pipe culverts	5" Std (5.563" O.D.)
7	1.6	58 ½"	36"	2' - 5"	6' - 4"	6' - 10"	7' - 3 ½"		
8	1.8	65"	40"	2' - 10"	6' - 10"	7' - 7"	8' - 3"		
9	1.9	73"	45"	3' - 2"	7' - 6"	8' - 5"	9' - 3"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third Cross Pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid as concrete riprap in accordance with Item 432, "Riprap."

(6) Quantities shown are for one end of one pipe culvert. For multiple Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

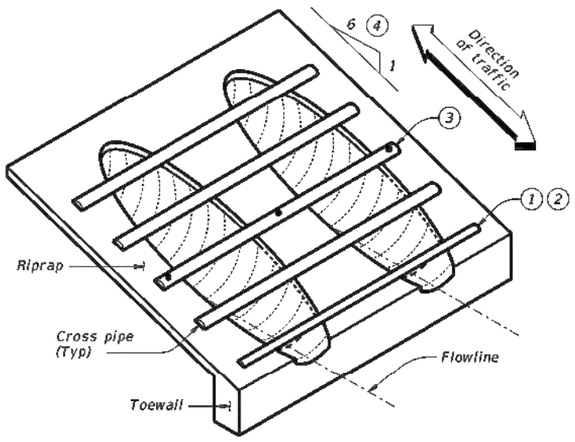
GENERAL NOTES:

Pipe runners are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

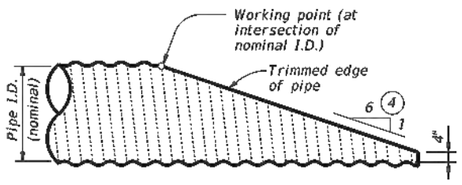
Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

Payment for riprap and toewall is included in the price bid for each safety end treatment.



ISOMETRIC VIEW OF TYPICAL INSTALLATION



NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT FOR DESIGN 1 TO 9 ARCH PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

SETP-PD-A

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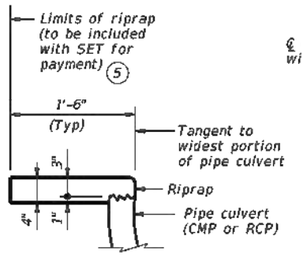
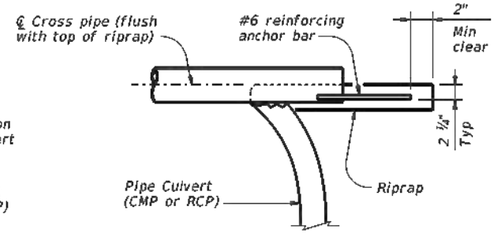
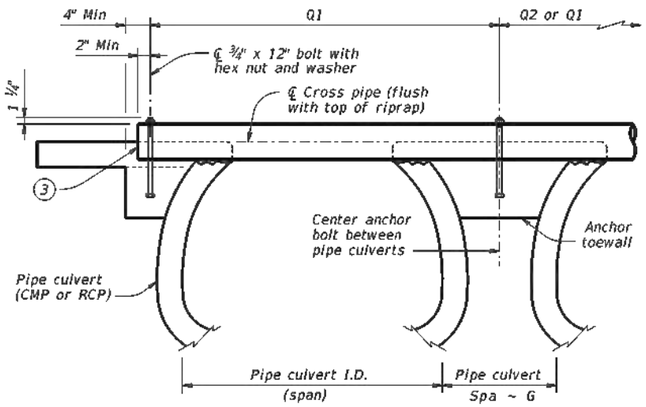


SHOWING TYPICAL PIPE CULVERT AND RIPRAP

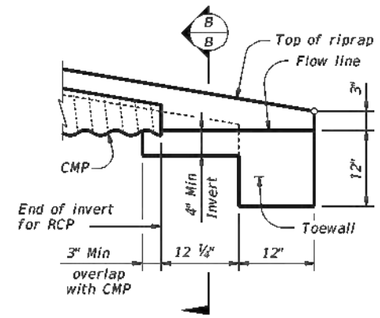


SHOWING CROSS PIPE WITH ANCHOR BAR



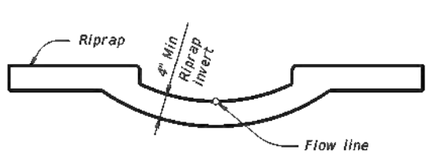
SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



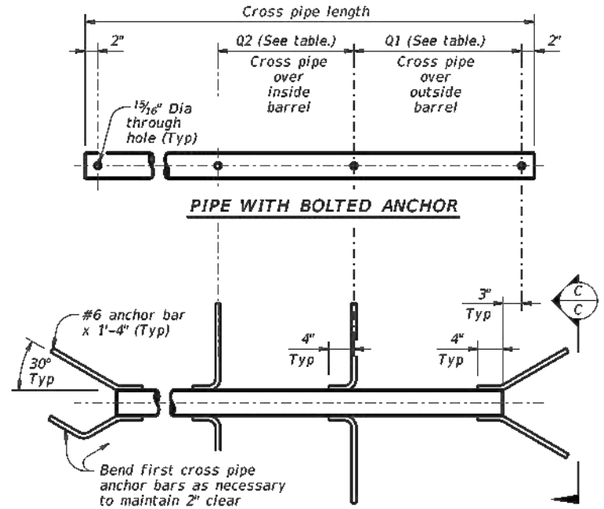
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



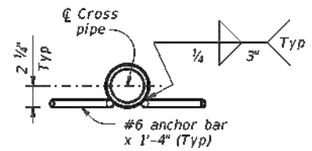
SECTION B-B

(Cross pipes not shown for clarity.)



PIPE WITH BOLTED ANCHOR

PIPE WITH ANCHOR BARS



SECTION C-C

CROSS PIPE DETAILS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT
FOR DESIGN 1 TO 9
ARCH PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD-A

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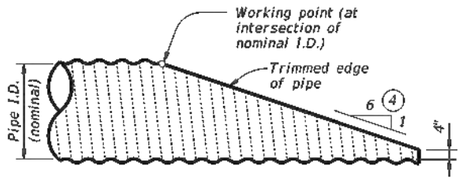
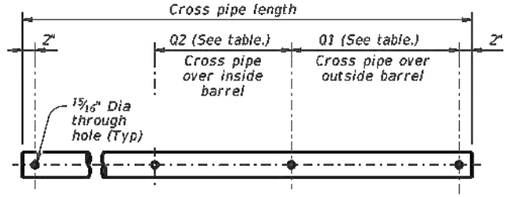


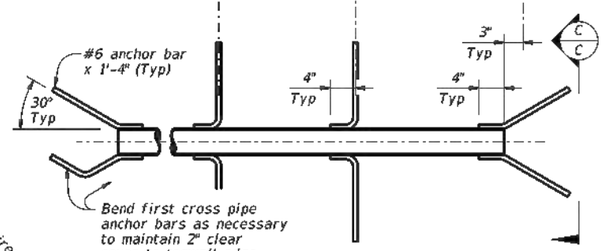
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

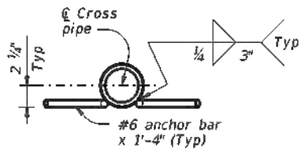
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

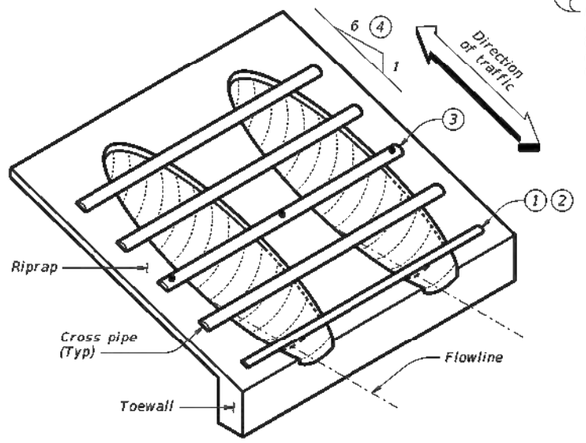


PIPE WITH ANCHOR BARS

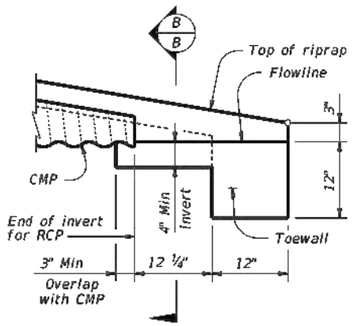


SECTION C-C

CROSS PIPE DETAILS

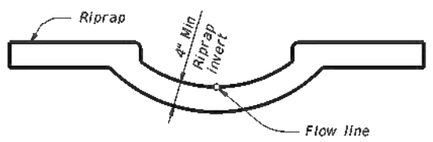


ISOMETRIC VIEW OF TYPICAL INSTALLATION



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap."

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

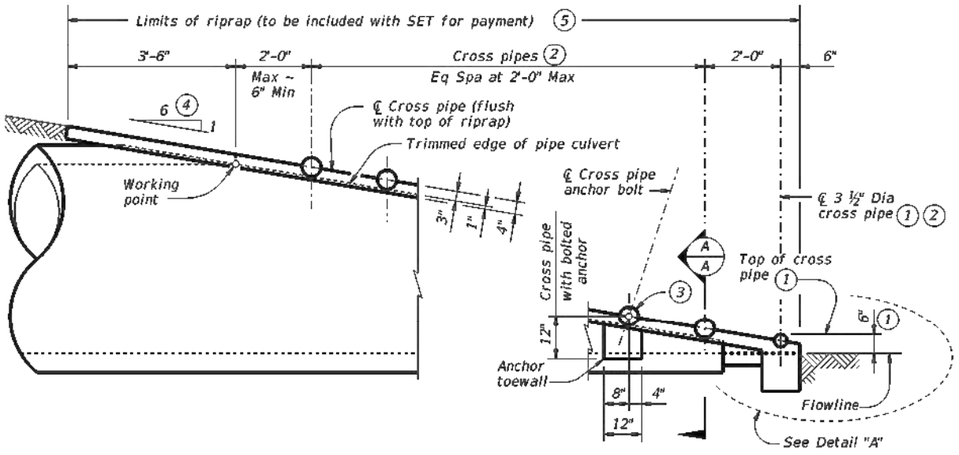
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

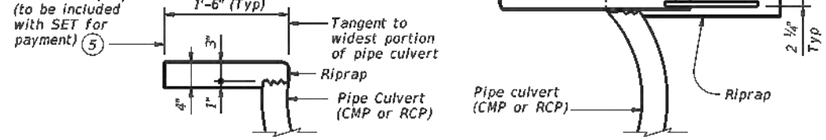
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap."

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



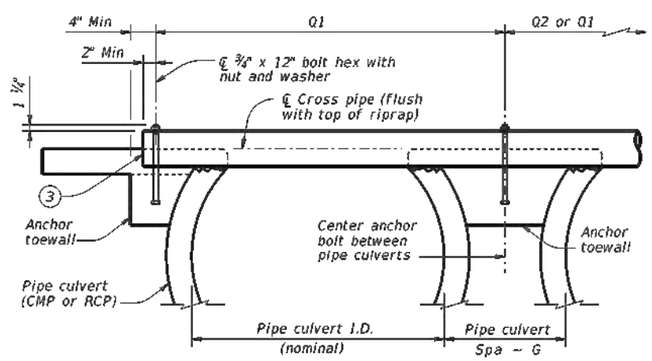
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: CD-SETP-PD-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
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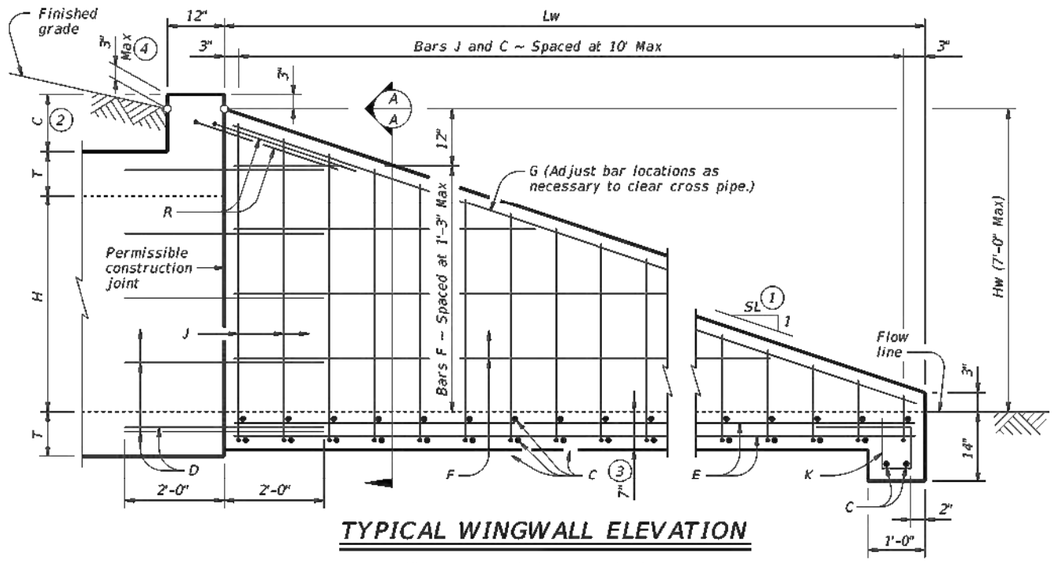
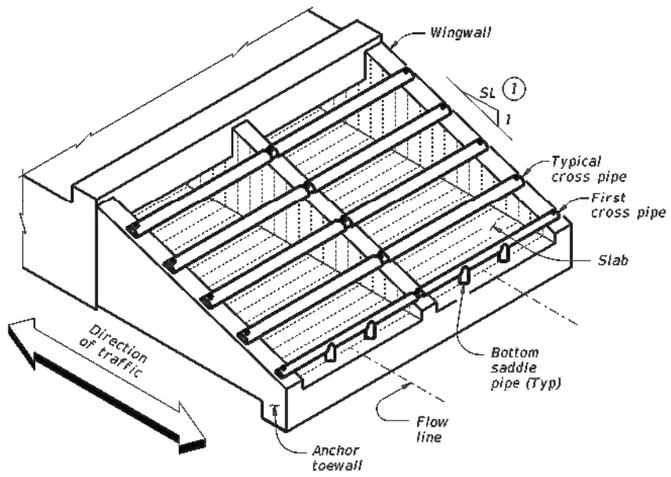


TYPICAL WINGWALL ELEVATION

(Cross pipes not shown for clarity.)



ISOMETRIC VIEW OF TYPICAL INSTALLATION

(Showing bolted anchor option.)

WING DIMENSION CALCULATIONS:

$Hw = H + T + C - 0.250'$

$Lw = (Hw - 0.250')\ (SL)$

For cast-in-place culverts:

$Atw = (N)\ (S) + (N + 1)\ (U)$

For precast culverts:

$Atw = (N)\ (2U + S) + (N - 1)\ (0.500')$

Total Wingwall Area (SF)

$= (0.5)\ (Hw + 0.250')\ (Lw)\ (N - 1)$

Total Concrete Volume (CY)

$= [(\text{Wingwall Area})\ (0.583') + (Lw)\ (Atw)\ (0.583') + (Atw)\ (1.000')\ (1.167' - 0.583')] \div (27)$

Total Reinforcing (Lb)

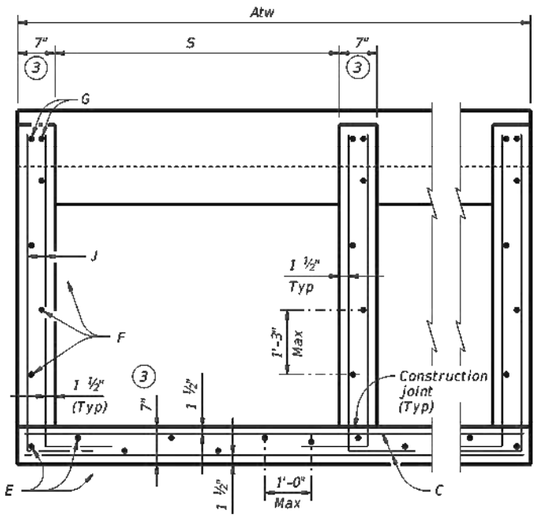
$= (1.55)\ (Lw)\ (Atw) + (4.43)\ (Atw) + (K)\ (Hw)\ (N + 1)\ (\sqrt{Lw})$

C = Height of curb above top of top slab (feet)
Hw = Height of wingwall (feet)
K = Constant value for use in formulas

Slope SL:1	K
6:1	~ 10.41

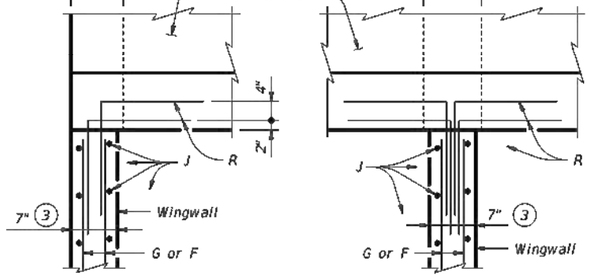
Atw = Anchor toewall length (feet)
Lw = Length of wingwall (feet)
N = Number of culvert barrels
SL:1 = Side slope ratio (horizontal : 1 vertical)

See applicable box culvert standard for H, S, T, and U values.



SECTION A-A

(Showing typical wingwall and wing slab reinforcing. Pipe runners not shown for clarity.)

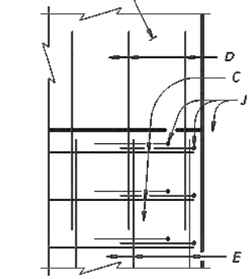


AT TOP OF EXTERIOR WINGWALL

(Cast-in-place culvert)

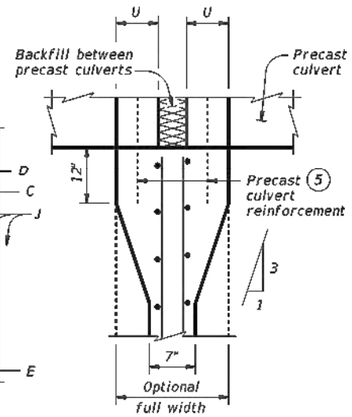
AT TOP OF INTERIOR WINGWALL

(Cast-in-place culvert)



AT OUTSIDE OF BOTTOM SLAB

(Cast-in-place culvert)



AT INTERIOR WINGWALL

(Precast culvert)

PLAN VIEWS OF CORNER DETAILS

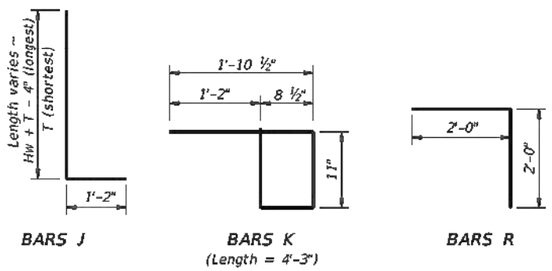


TABLE OF REINFORCING BAR SIZES AND SPACING

Bar	Size	Spacing
C	#4	10" Max
D	#4	Match F and E
E	#4	1'- 0" Max
F	#4	1'- 3" Max
G	#6	As shown
J	#4	10" Max
K	#4	1'- 0" Max
R	#4	As shown

(1) Provide 6:1 or flatter slope.

(2) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to Extended Curb Details the Extended Curb Details (ECD) standard sheet.

(3) Wingwall and slab thicknesses may be the same as the adjacent culvert wall and slab thicknesses (7" Minimum). If thicknesses greater than the minimum (7") are used, no changes will be made in quantities and no additional compensation will be allowed.

(4) For vehicle safety, reduce height, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) For culverts with C = 0", the precast culvert reinforcing may extend 1'-0" minimum into wingwall. Wingwall bars D and R may be omitted. Otherwise, refer to the Wingwall Connection detail on the Box Culvert Precast Miscellaneous Details (SCP-MD) standard sheet.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Adjust reinforcing as necessary to provide a minimum clear cover of 1½".
Provide Class "C" concrete (f'c = 3,600 psi).
Provide pipe runners, cross pipes, and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
Provide ASTM A307 bolts.
Galvanize all steel components, except the concrete reinforcing, unless required elsewhere in the plans, after fabrication.
Repair galvanizing damaged during transport or construction in accordance with Item 445, "Galvanizing."

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.
Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.
The quantities for concrete, reinforcing steel, and cross pipes resulting from the formulas given herein are for Contractor's information only.
See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
Alternate design drawings bearing the seal of a professional engineer will be acceptable for precast construction of the safety end treatments.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

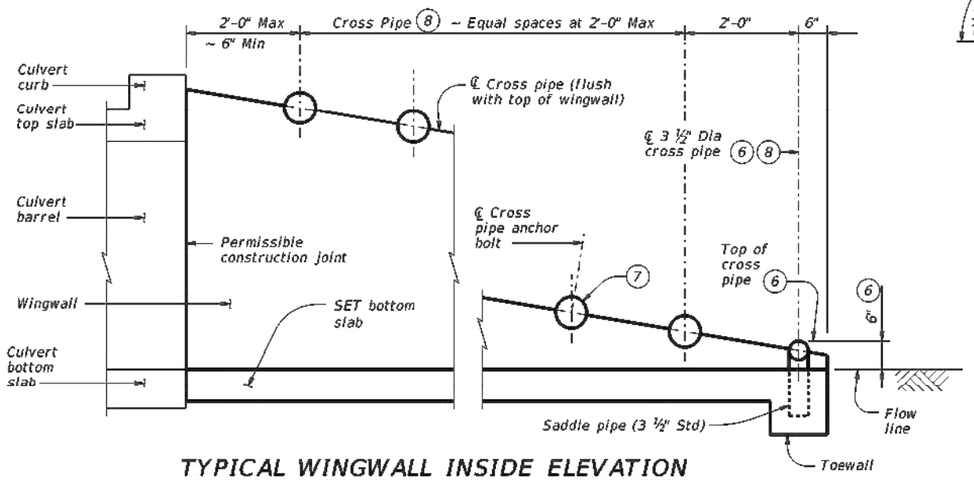
Bridge Division Standard

SAFETY END TREATMENT FOR BOX CULVERTS (MAXIMUM Hw = 7'-0") TYPE I ~ PARALLEL DRAINAGE

SETB-PD

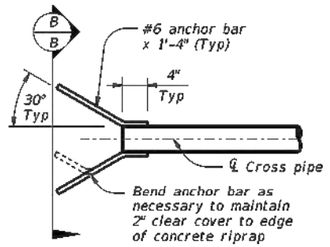
FILE: CD-SETBPD-22.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 06-2022 — Wing dimensions				
	DIST	COUNTY		SHEET NO.
				34

DATE:
FILE:

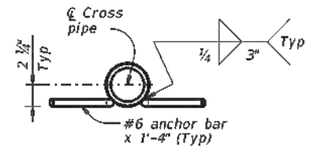


TYPICAL WINGWALL INSIDE ELEVATION

(Showing installation of cross pipes.)

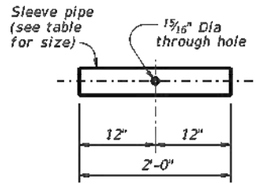


PART PLAN



SECTION B-B

OPTIONAL ANCHOR BAR DETAILS



SLEEVE PIPE DETAILS (9)

REQUIRED PIPE SIZES (8)

Culvert Span Sizes	Cross Pipe Size	Sleeve Pipe Size (9)
First Pipe	3 ½" STD	2 ½" STD
30" to 42"	4" STD	3" STD
48" to 72"	5" STD	4" STD
78" to 120"	6" STD	5" STD

STANDARD PIPE SIZES

Pipe Size	Pipe O.D.	Pipe I.D.
2 ½" STD	2.875"	2.469"
3" STD	3.500"	3.068"
3 ½" STD	4.000"	3.548"
4" STD	4.500"	4.026"
5" STD	5.563"	5.047"
6" STD	6.625"	6.065"

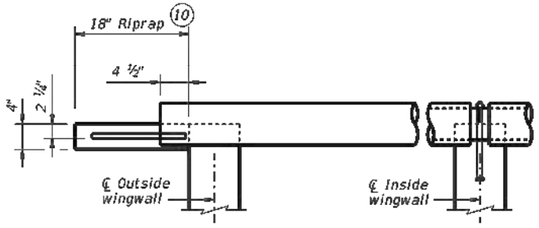
(6) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe at no more than 6" above the flow line.

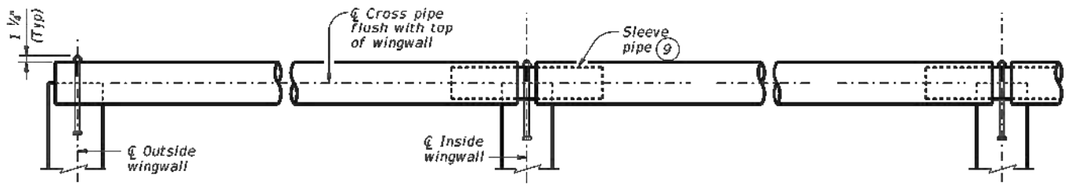
(7) Always install the third cross pipe from the bottom of the culvert using a bolted connection. Take care to ensure that concrete does not flow into this cross pipe so as to permit disassembly of the bolted connection to allow cleanout access.

(8) Provide cross pipes and sleeve pipes (if required) as shown in the Required Pipe Sizes table. Provide 3 1#2" saddle pipes for the 3 1#2" first cross pipe.

(9) At Contractor's option, make the cross pipe continuous across the inside wingwalls. If this option is selected, omit the sleeve pipe and make a 15#16" diameter throughhole in the cross pipe to accept the anchor bolt at the centerline of each interior wingwall.

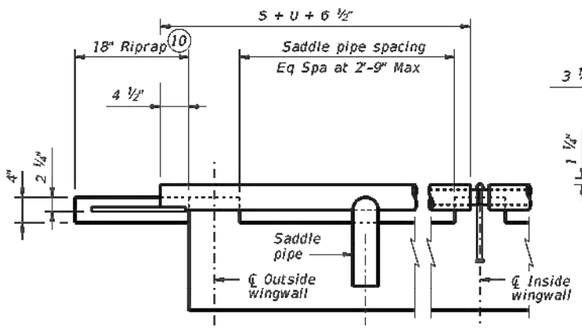
(10) Provide riprap when using the Optional Anchor Bar details. Riprap is included in the bid price for Safety End Treatment. Provide riprap in accordance with Item 432, "Riprap."

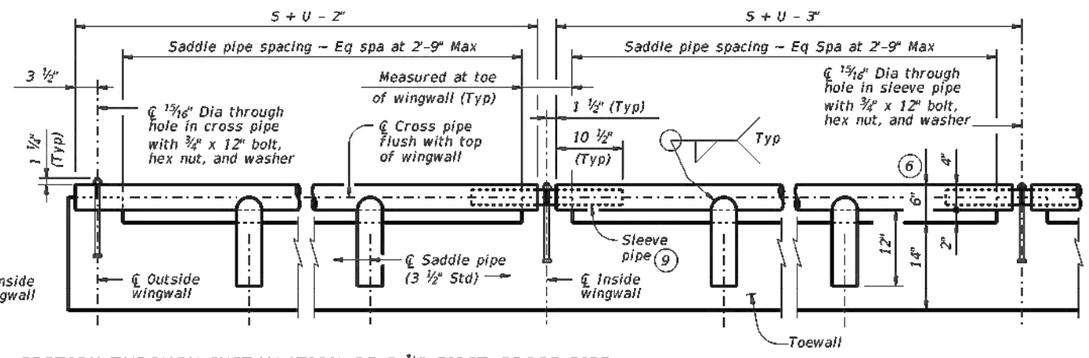




SECTION THROUGH INSTALLATION OF TYPICAL FULL CROSS PIPE

(Anchor details and dimensions are similar to those shown below in Section Through Installation of 3 ½" First Cross Pipe detail.)





SECTION THROUGH INSTALLATION OF 3 ½" FIRST CROSS PIPE

OUTSIDE CULVERT BARREL WITH OPTIONAL ANCHOR BARS & RIPRAP

OUTSIDE CULVERT BARREL WITH BOLTED ANCHOR

INSIDE CULVERT BARREL

CROSS PIPE INSTALLATION DETAILS

SHEET 2 OF 2

Texas Department of Transportation

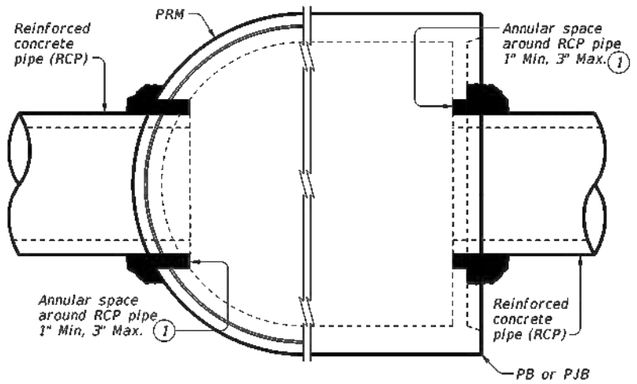
Bridge Division Standard

SAFETY END TREATMENT
FOR BOX CULVERTS
(MAXIMUM Hw = 7'-0")
TYPE I ~ PARALLEL DRAINAGE

SETB-PD

FILE: CD-SETBPD-22.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 06-2022 — Wing dimensions				
	DIST	COUNTY		SHEET NO. 35

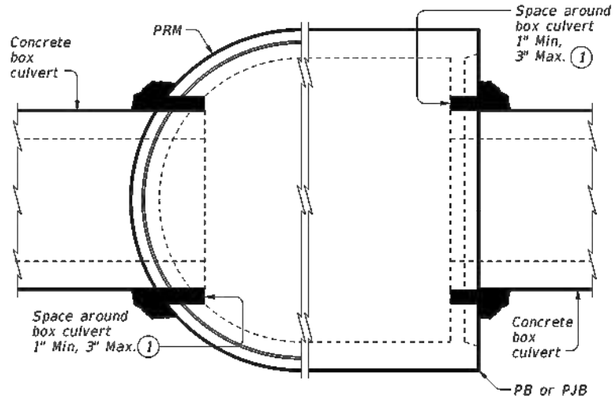
DATE:
FILE:



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

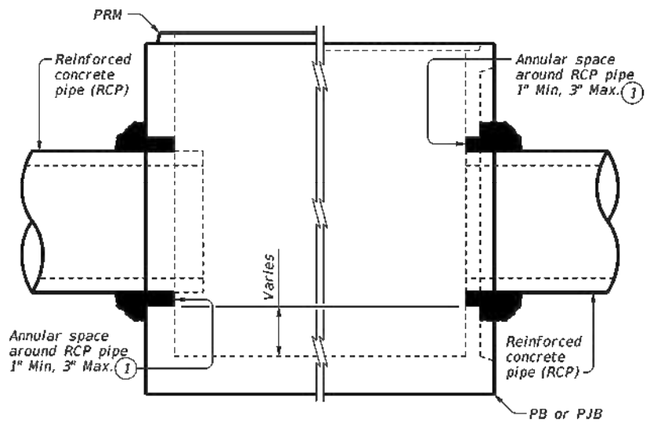
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

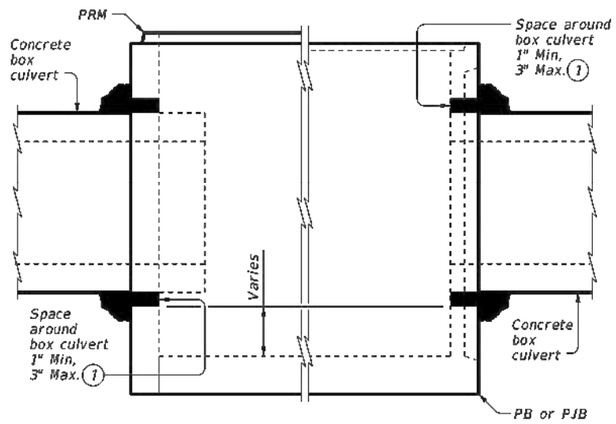
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

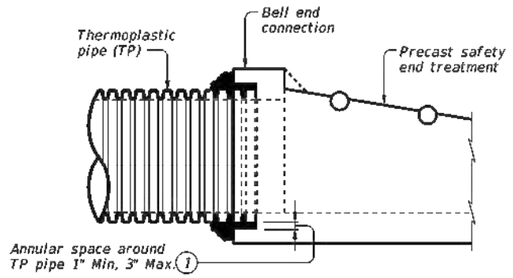
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) *Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application."*

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application."

GENERAL NOTES:

See applicable standards for notes and details not shown:
- *Precast Base (PB)*
- *Precast Junction Box (PJB)*
- *Precast Round Manhole (PRM)*
- *Precast Safety End Treatments C/D Square (PSET-SC)*
- *Precast Safety End Treatments P/D Square (PSET-SP)*

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains."

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe."

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid items.

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

FILE: CD-PBGC-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.
				36

Pictures


QUAIL RUN
BRIAR CREEK


DOLLAR GENERAL


DOWN

On-Site Checklist

Field Observation Report

Project Name: Central Richwood Flood and Drainage Project
Contract #: 2022-100107-RMP
Date of Field Visit: 2023-07-24

General Information

County:	Brazoria
City:	Richwood
Location:	4 Oaks St, Briarcreek St, and Quail Run Drive, Richwood, TX

Ecological Site Information
General site description (residential,commercial, forested, grassland, etc.):
Currently, the existing concrete streets are in poor condition and are inundated up to 3 feet during intense rain events. Adjacent to the existing concrete streets are aged water mains. The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.
Water bodies present? If yes, describe (pond, lake, creek, river, wetland, etc.):
There is a drainage channel, pictures attached
Special or unique vegetation features?
The area is residential, the vegetation is standard for suburban neighborhoods
Special wildlife habitat?
Unknown
Observed wildlife:
No wildlife observed
National,state, or locally designated park or natural reserve at, or adjacent to, project site?
N/A

Hazardous Material Issues	
Yes/No	Does the project include any of the following activities (indicate all that apply)?
No	Structure demolition operations or structure modifications.
	If yes, is there potential for the building to contain asbestos or lead-based paint?
Not likely, but will confirm as design progresses.	Pipeline and underground utility installation or adjustments.
N/A	De-watering.
None required	Purchase of new ROW or easement.

There will be improvements to the underground storm sewer structures, perhaps a little. For the environmental clearance, please widen the construction limits by 25 feet throughout the project area and deepen the indicated excavation limits by 3 feet. Please note that standard water main depth is a minimum of 4 feet for the invert of the 6-inch water main, so to be on the safe side, assume a depth of 5 feet for the water main (plus the additional 3 feet mentioned above).	Trenching, drilled shafts, cuts or other excavations.
Project Site Survey	
(Yes/No)	Specific concerns identified on, or adjacent to, project area:
N/A	aboveground storage tanks
N/A	underground storage tanks
N/A	vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground
No	electrical and transformer equipment
N/A	If yes, are there signs of leaking transformers oil (PCBs) on the ground?
N/A	injection wells, cisterns, sumps, dry wells flooring, drains, or walls stained by substances other than water or emitting foul odors
N/A	vats, 55-gallon drums (labeled/unlabeled), canisters, barrels, bottles, etc.
N/A	surface dumping of trash, garbage, refuse, rubbish, debris half exposed/buried, landfill, stockpiling, storage, etc.
N/A	damaged or discarded automotive or industrial batteries
N/A	stained, discolored, barren, exposed or foreign (fill) soil
N/A	dead, damaged or stressed vegetation
N/A	oil sheen or films on surface water, seeps, lagoons, ponds, or drainage basins

N/A	pits, ponds, or lagoons associated with waste treatment or waste disposal
N/A	changes in drainage patterns from possible fill areas
N/A	security fencing, protected areas, placards, warning signs
N/A	dead animals possibly due to contamination
Miscellaneous Observations	
(Yes/No)	**Other compliance factors identified on, or adjacent to, project area:**
	Historic age buildings
N/A	Refineries
N/A	Airports, runway strips
N/A	Educational facilities
There is a Dollar Genereal at Qual and Oystercreek Dr but should not be affected by the project.	Commercial facilities
N/A	Healthcare facilities
N/A	Social services facilities

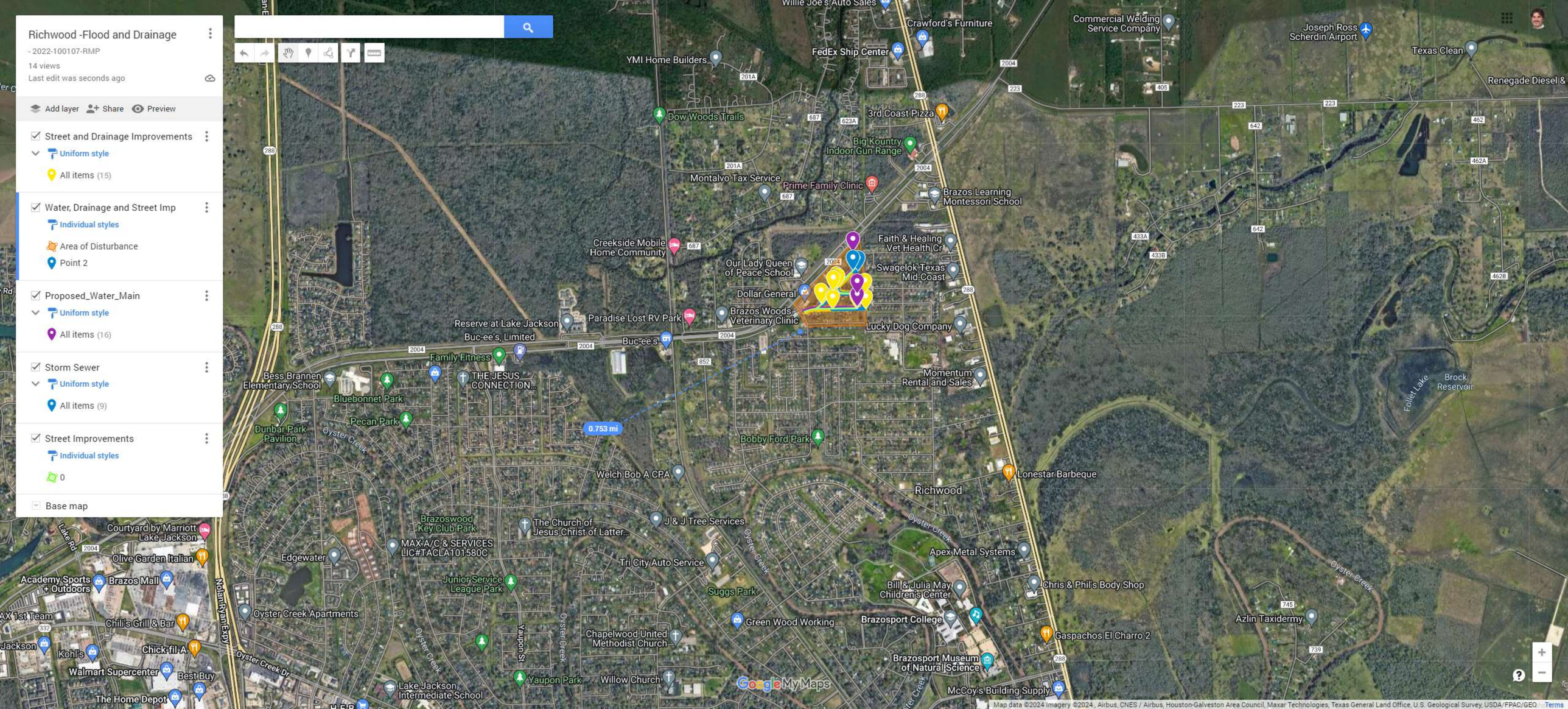
Describe any "Yes" answers indicated above:
none

Any additional information:
none.

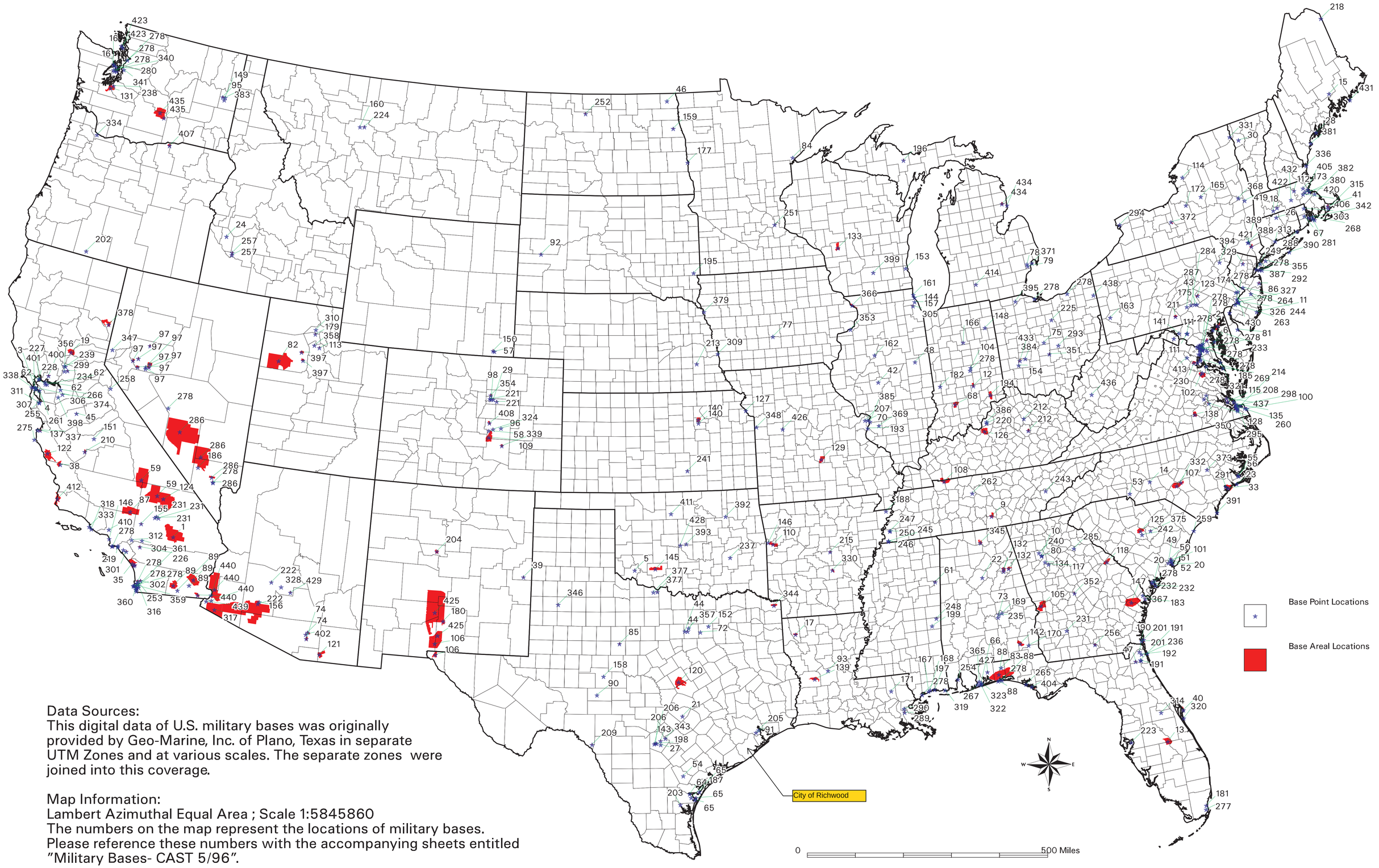
Name of Site Investigator: Miriam Moran
Title: PMI Project Manager
Company: Public Management, Inc.
Interviewer's Digital Certification that all information provided is accurate: Yes
Date: 2023-07-24

COMPLIANCE CHECKLIST BACKUP

Airport Hazards


Richwood -Flood and Drainage
- 2022-100107-RMP
14 views
Last edit was seconds ago
Add layer
Share
Preview
Street and Drainage Improvements
Uniform style
All items (15)
Water, Drainage and Street Imp
Individual styles
Area of Disturbance
Point 2
Proposed_Water_Main
Uniform style
All items (16)
Storm Sewer
Uniform style
All items (9)
Street Improvements
Individual styles
0
Base map
0.753 mi
Willie Joe's Auto Sales
Crawford's Furniture
Commercial Welding Service Company
Joseph Ross Scherdin Airport
Texas Clean
Renegade Diesel &
YMI Home Builders
FedEx Ship Center
Dow Woods Trails
3rd Coast Pizza
Big Kountry Indoor Gun Range
Montalvo Tax Service
Prime Family Clinic
Brazos Learning Montessori School
Creekside Mobile Home Community
Faith & Healing Vet Health Cr
Our Lady Queen of Peace School
Swagelok Texas Mid-Coast
Dollar General
Brazos Woods Veterinary Clinic
Paradise Lost RV Park
Reserve at Lake Jackson
Buc-ee's, Limited
Buc-ee's
Lucky Dog Company
Family Fitness
THE JESUS CONNECTION...
Bess Brannen Elementary School
Bluebonnet Park
Momentum Rental and Sales
Dunbar Park Pavilion
Pecan Park
Oyster Creek
Follett Lake
Brock Reservoir
Bobby Ford Park
Welch Bob A CPA
Lonestar Barbeque
Richwood
Brazoswood Key Club Park
The Church of Jesus Christ of Latter...
J & J Tree Services
Courtyard by Marriott Lake Jackson
Olive Garden Italian
MAX-A/C & SERVICES LIC#TACLA101580C
Edgewater
Tri City Auto Service
Apex Metal Systems
Academy Sports + Outdoors
Brazos Mall
Junior Service League Park
Suggs Park
Bill & Julia May Children's Center
Chris & Phil's Body Shop
Oyster Creek Apartments
Chili's Grill & Bar
Green Wood Working
Brazosport College
Azlin Taxidermy
Chick-fil-A
Kohl's
Chapelwood United Methodist Church
Gaspachos El Charro 2
Walmart Supercenter
Best Buy
Yaupon Park
Willow Church
Brazosport Museum of Natural Science
Lake Jackson Intermediate School
McCoy's Building Supply
The Home Depot
Google My Maps
Map data ©2024 Imagery ©2024 , Airbus, CNES / Airbus, Houston-Galveston Area Council, Maxar Technologies, Texas General Land Office, U.S. Geological Survey, USDA/FPAC/GEO
Terms

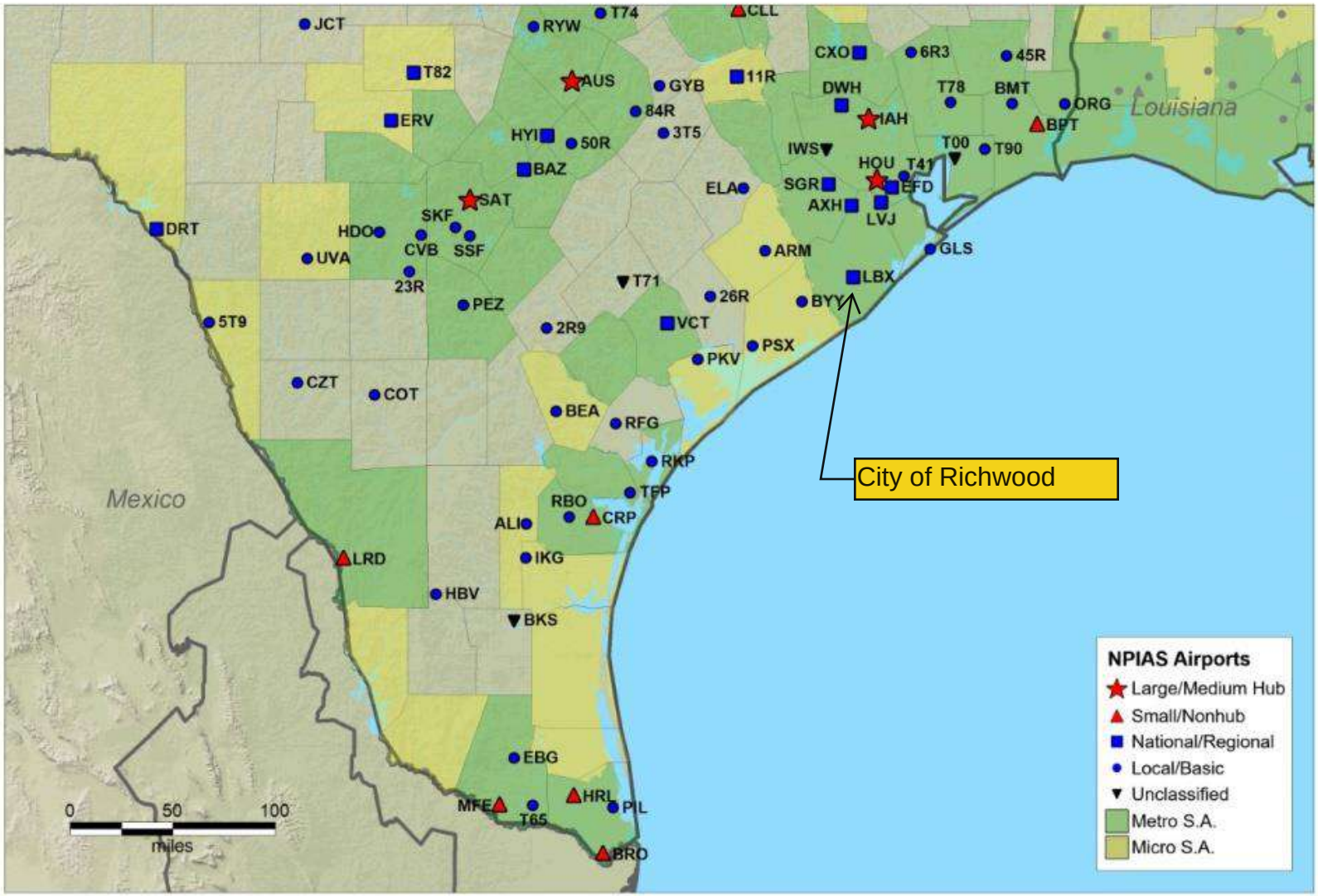
Military Bases in the Continental United States



Data Sources:
This digital data of U.S. military bases was originally provided by Geo-Marine, Inc. of Plano, Texas in separate UTM Zones and at various scales. The separate zones were joined into this coverage.

Map Information:
Lambert Azimuthal Equal Area ; Scale 1:5845860
The numbers on the map represent the locations of military bases.
Please reference these numbers with the accompanying sheets entitled "Military Bases- CAST 5/96".

Texas (Southeast)



Coastal Barriers

BASEMAPS

- STREETS
- HYBRID
- GRAY
- USGS TOPO
- USDA NAIP IMAGERY

MAP LAYERS

- CBRS Units

Click here to learn more about CBRS Units.

Measure

LEGEND

CBRS Units

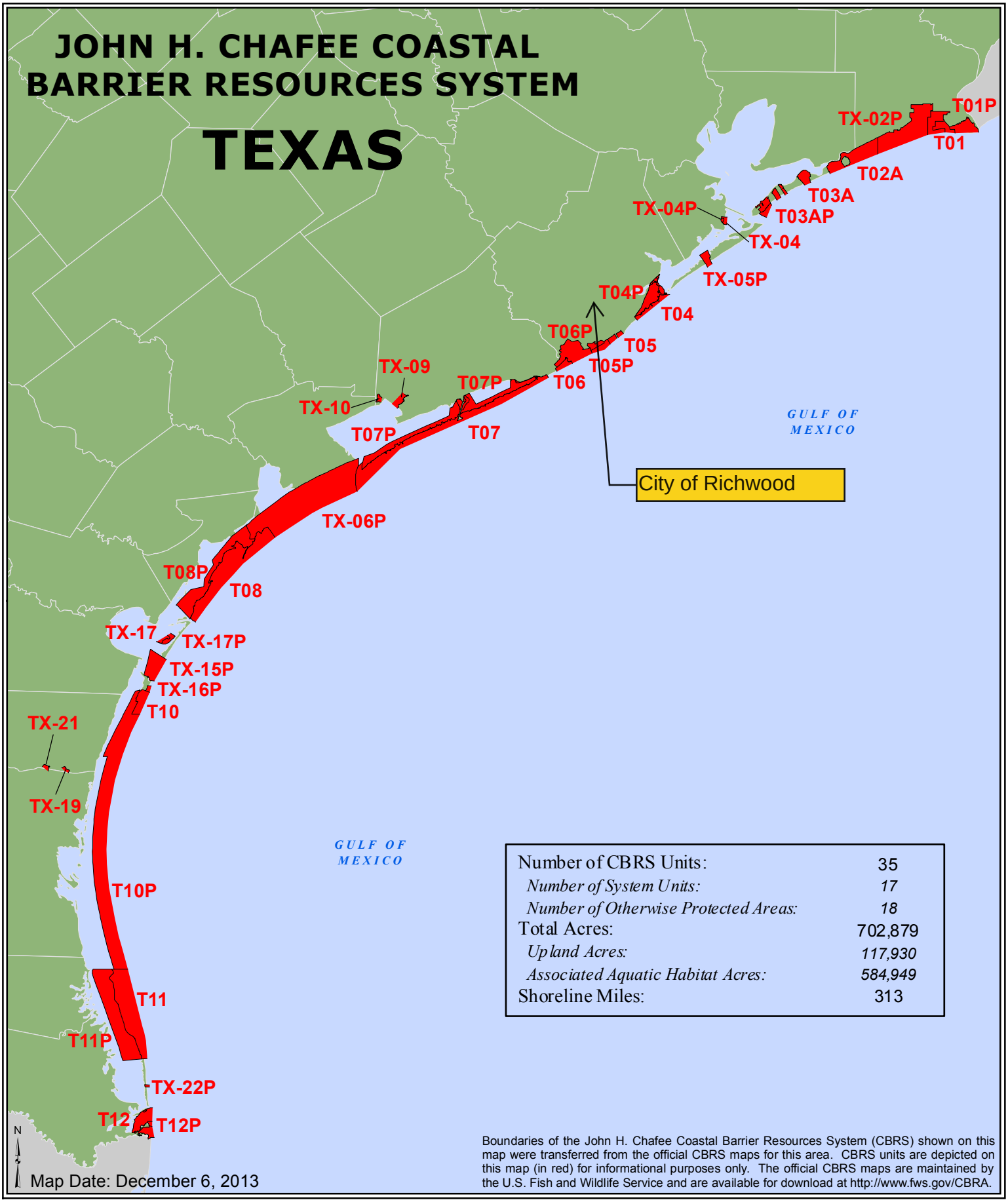
- Otherwise Protected Area
- System Unit

City fo Richwood

1: 144,448
29.221 | -95.163

JOHN H. CHAFEE COASTAL BARRIER RESOURCES SYSTEM

TEXAS



Number of CBRS Units:	35
Number of System Units:	*17*
Number of Otherwise Protected Areas:	*18*
Total Acres:	702,879
Upland Acres:	*117,930*
Associated Aquatic Habitat Acres:	*584,949*
Shoreline Miles:	313

Map Date: December 6, 2013

Boundaries of the John H. Chafee Coastal Barrier Resources System (CBRS) shown on this map were transferred from the official CBRS maps for this area. CBRS units are depicted on this map (in red) for informational purposes only. The official CBRS maps are maintained by the U.S. Fish and Wildlife Service and are available for download at http://www.fws.gov/CBRA.

Flood Insurance

Federal Emergency Management Agency
Community Status Book Report
TEXAS
Communities Participating in the National Flood Program

CID	Community Name	County	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date	Tribal
	The City of Presidio will be converted to the regular phonse of the NFIP using the County map. The county map number is 480530 panel 700. PDS						
481198A	PRIMERA, TOWN OF	CAMERON COUNTY	08/13/76	02/16/18	02/16/18	10/29/82	No
480757#	PRINCETON, CITY OF	COLLIN COUNTY	07/25/75	03/16/88	06/02/09(M)	03/16/88	No
481677	PROGRESO, CITY OF	HIDALGO COUNTY		11/16/82		04/03/97	No
	THE CITY OF PROGRESO HAS ADOTPED THE HIDALGO COUNTY [480334] FIRM PANEL 0525.						
480141#	PROSPER, TOWN OF	DENTON COUNTY/COLLIN COUNTY	06/21/74	05/04/82	04/18/11	05/04/82	No
480283	QUANAH, CITY OF	HARDEMAN COUNTY	08/09/74	08/24/82	08/24/82(M)	08/24/82	No
481117#	QUEEN CITY, CITY OF	CASS COUNTY	04/23/76	04/03/12	04/03/12(M)	04/03/12	No
480370#	QUINLAN, CITY OF	HUNT COUNTY	04/16/76	09/04/91	01/06/12	05/10/10	No
481301#	QUINTANA, TOWN OF	BRAZORIA COUNTY		05/08/71	09/22/99	05/08/71	No
481057#	QUITMAN, CITY OF	WOOD COUNTY	09/12/75	09/03/10	09/03/10(M)	09/03/10	No
480975#	RAINS COUNTY*	RAINS COUNTY	10/18/77	04/17/12	04/17/12(M)	04/17/12	No
480161	RALLS, CITY OF	CROSBY COUNTY	06/14/74		(NSFHA)	04/15/82	No
481646A	RANCHO VIEJO, TOWN OF	CAMERON COUNTY		02/16/18	02/16/18	07/10/92	No
	USE CAMERON COUNTY [480101] FIRM						
480532#	RANDALL COUNTY *	RANDALL COUNTY	01/10/78	06/04/10	06/04/10	09/30/82	No
480205A	RANGER, CITY OF	EASTLAND COUNTY	05/17/74	07/01/99	04/05/19(M)	07/01/99	No
480110A	RANGERVILLE, CITY OF	CAMERON COUNTY		02/16/18	02/16/18	06/11/19	No
481577#	RANSOM CANYON, TOWN OF	LUBBOCK COUNTY	11/29/77	11/01/85	09/28/07	11/01/85	No
480666A	RAYMONDVILLE, CITY OF	WILLACY COUNTY	06/14/74	05/05/81	04/05/17	05/05/81	No
481242	REAGAN COUNTY *	REAGAN COUNTY				06/14/02(E)	No
480978#	REAL COUNTY *	REAL COUNTY	02/19/82	06/05/85	06/05/85(M)	06/05/85	No
481650#	RED OAK, CITY OF	ELLIS COUNTY		01/20/99	06/03/13	01/20/99	No
480309#	REDWATER, CITY OF	BOWIE COUNTY		10/19/10	10/19/10(M)	10/19/10	No
485501#	REFUGIO COUNTY *	REFUGIO COUNTY	10/22/71	10/22/71	09/26/14	10/22/71	No
480540#	REFUGIO, TOWN OF	REFUGIO COUNTY	02/07/75	10/06/76	09/26/14	10/06/76	No
480618#	REKLAW, CITY OF	CHEROKEE COUNTY/RUSK COUNTY		09/29/10	01/06/11(M)	12/23/10	No
481254#	RENO, CITY OF	LAMAR COUNTY	08/13/76	09/28/82	08/16/11(M)	09/28/82	No
480969#	RENO, CITY OF	TARRANT COUNTY/PARKER COUNTY	11/05/76	09/26/08	09/25/09(M)	11/23/09	No
481054#	RHOME, CITY OF	WISE COUNTY		03/19/90	12/16/11(M)	03/31/10	No
480957#	RICE, CITY OF	NAVARRO COUNTY	09/26/75	08/01/09	06/05/12(M)	04/09/09	No
480184E	RICHARDSON, CITY OF	DALLAS COUNTY/COLLIN COUNTY	05/24/74	12/04/79	06/07/17	12/04/79	No
480608B	RICHLAND HILLS, CITY OF	TARRANT COUNTY	03/15/74	02/16/77	03/21/19	02/16/77	No
480958#	RICHLAND, CITY OF	NAVARRO COUNTY	07/25/75	06/05/12	06/05/12(M)	02/08/18	No
480231#	RICHMOND, CITY OF	FORT BEND COUNTY	06/28/74	03/01/82	04/02/14	01/09/87	No
485502#	RICHWOOD, CITY OF	BRAZORIA COUNTY		07/28/72	09/22/99	07/28/72	No
481684#	RIO BRAVO, CITY OF	WEBB COUNTY		05/17/82	04/02/08(M)	09/15/98	No
	THE CITY OF RIO BRAVO HAS ADOPTED THE WEBB COUNTY (481059)FIRM PANEL 850.						
481678#	RIO GRANDE CITY, CITY OF	STARR COUNTY	01/24/78	07/01/87	04/19/10(M)	10/22/97	No
	USE THE STARR COUNTY (480575) FIRM.						
480112A	RIO HONDO, CITY OF	CAMERON COUNTY	05/10/74	06/01/81	02/16/18	06/01/81	No
481159#	RIO VISTA, CITY OF	JOHNSON COUNTY		09/27/91	12/04/12(M)	09/27/91	No
480795A	RISING STAR, CITY OF	EASTLAND COUNTY	09/26/75	10/31/78	10/31/78(M)	10/31/78	No

STATUTORY CHECKLIST BACKUP

Clean Air

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 22, 2023

Michael Gamez
Acting Regional Administrator
U.S. Department of Housing and Urban Development
Fort Worth Regional Office
307 W. 7th St., Suite 1000
Fort Worth, TX 76102

VIA EMAIL

Subject: Finding on Certain Projects Subject to Air Quality General Conformity Review

Dear Acting Administrator Gamez:

General conformity requirements in 40 Code of Federal Regulations (CFR) Part 93, Subpart B and United States Environmental Protection Agency (EPA) guidance allow a federal agency to determine that an action is exempt from general conformity requirements if it concludes the action to be *de minimis* based on comparison to a previous project that is similar in size and scope to the proposed action and for which an emissions analysis was completed. General conformity *de minimis* thresholds in 40 CFR §93.153(b)(1) are based on criteria pollutant and classification, with lower thresholds associated with higher nonattainment classifications. Effective November 7, 2022, the Dallas-Fort Worth (DFW) and Houston-Galveston-Brazoria (HGB) ozone nonattainment areas were reclassified to severe for the 2008 eight-hour ozone National Ambient Air Quality Standard (NAAQS) (87 FR 60926). The general conformity *de minimis* threshold for this classification is 25 tons per year (tpy) of nitrogen oxides (NO_x) or volatile organic compounds (VOC) emissions, which is currently the lowest general conformity *de minimis* threshold for any ozone nonattainment area in Texas.

The Texas Commission on Environmental Quality (TCEQ) reviewed a list of historical projects determined by the United States Department of Housing and Urban Development (HUD) Region VI to be categorically similar to HUD-funded projects. Attachment A: Finding on Air Quality General Conformity Review contains a list of the historical projects found by the TCEQ to contain adequate emissions analysis documentation. The historical projects in Attachment A are grouped according to those with estimated NO_x and/or VOC emissions less than 50 tpy but greater than or equal to 25 tpy, and those less than 25 tpy. The TCEQ finds that proposed HUD-funded projects in Texas, including projects that qualify under 24 CFR §58.35 as categorical exclusions, that are categorically similar to the historical projects listed in Attachment A and that are comparable or smaller in scope and size are not expected to exceed the thresholds listed.

The TCEQ provides this finding to assist HUD's review of future potential projects. However, it is a federal agency's responsibility to comply with the National Environmental Policy Act and federal general conformity requirements. This finding applies solely to general conformity determinations regarding ozone and is valid until September 22, 2025 or until a final EPA action invalidates the finding. When expired or invalidated by EPA action, the finding and project categories and historical analyses included in Attachment A may be re-evaluated.

If you have questions concerning this finding, please contact Jamie Zech at jamie.zech@tceq.texas.gov or (512) 239-3935.

Sincerely,

Donna F. Huff, Deputy Director
Air Quality Division
Texas Commission on Environmental Quality

Attachment

cc: Guy Donaldson, U.S. Environmental Protection Agency Region 6

Attachment A:
Finding on Air Quality General Conformity Review

The following is a list of historical projects for use by Region VI of the United States Department of Housing and Urban Development (HUD) to determine whether projects in Texas would be considered by the Texas Commission on Environmental Quality (TCEQ) to be *de minimis* for air quality general conformity purposes. The projects are grouped according to HUD project type and estimated emissions.

It is a federal agency's responsibility to comply with the National Environmental Policy Act and federal general conformity requirements.

WATER/WASTEWATER IMPROVEMENTS

NO_x and VOC < 50 tpy and ≥ 25 tpy

None listed

NO_x and VOC < 25 tpy

Palos Verdes Recycled Water Pipeline Project, 2017, https://www.westbasin.org/wp-content/uploads/2017/09/9-22-17-PV-Pipeline-Project-Notice-and-CEQA-Study-PDF.pdf, accessed August 4, 2023.

Sacramento Regional County Sanitation District's South Sacramento County Agriculture and Habitat Lands Recycled Water Program, 2017, https://www.regionalsan.com/sites/main/files/file-attachments/feir_southcountyag_2-10-2017002_0_0.pdf, accessed August 4, 2023.

Las Vegas Paiute Tribe Snow Mountain Reservation Public Water System Improvement Project, 2017, https://www.epa.gov/sites/production/files/2017-08/documents/environmental_assessment_for_the_las_vegas_paiute_tribe_snow_mountain_reservation_public_water_system_improvement_project.pdf, accessed August 4, 2023.

Bay Bridge Pump Station and Force Mains Replacement Project (Project No. SP-178), 2017, https://www.ocsd.com/Home/ShowDocument?id=19600, accessed August 4, 2023.

FLOOD AND DRAINAGE IMPROVEMENTS

NO_x and VOC < 50 tpy and ≥ 25 tpy

Alamo Creek and Ulatis Creek Detention Basins Project (SCH No. 2010022023), 2011, https://www.ci.vacaville.ca.us/government/public-works/flood-control-storm-information/alamo-creek-and-ulatis-creek-detention-basins-project, accessed August 4, 2023.

NO_x and VOC < 25 tpy

Termino Avenue Drain Project (SCH No. 2000111022), 2008, http://www.ladpw.org/pdd/reports/Termino_EIR08_Final.pdf, accessed August 4, 2023.

Fagatogo Stormwater Modification, American Samoa Disaster Relief Office (FEMA-1506-DR-AS, HMGP #1506-4), 2008, https://www.hsdl.org/?view&did=484703, accessed August 4, 2023.

STREET IMPROVEMENTS

NO_x and VOC < 50 tpy and ≥ 25 tpy

None listed

NO_x and VOC < 25 tpy

Century Boulevard Extension Project Between Grape Street and Alameda Street, City of Los Angeles (CML-5006(810)), 2016, http://eng2.lacity.org/techdocs/emg/docs/CenturyBoulevardExtension/EnvironmentalAssessment.pdf, accessed August 4, 2023.

PUBLIC FACILITIES

NO_x and VOC < 50 tpy and ≥ 25 tpy

None listed

NO_x and VOC < 25 tpy

Los Angeles Department of Water and Power West Los Angeles District Headquarters Administration Building, 2005, https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=LADWP004459&RevisionSelectionMethod=LatestReleased, accessed August 4, 2023.

Hollywood-La Kretz Customer Service and Community Center Project, 2011, https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=LADWP003782&RevisionSelectionMethod=LatestReleased, accessed August 4, 2023.

HOUSING

NO_x and VOC < 50 tpy and ≥ 25 tpy

13-Lot Residential Development (APN 224-142-01) and Annexation, Escondido, California, 2014, https://www.escondido.org/Data/Sites/1/media/PDFs/Planning/Pickering/Initial%20Study-MNDPickering2ResidentialAnnexationProject2014-06-17(Final).pdf, accessed August 4, 2023.

NO_x and VOC < 25 tpy

Reseda Boulevard Mixed-Use Project, City of Los Angeles (Case No. ENV-2015-3703-MND), 2018, http://planning.lacity.org/StaffRpt/InitialRpts/CPC-2015-3702.PDF, accessed August 4, 2023.

The Alexan Project, City of Los Angeles (Case No. ENV-2006-6302-MND-REC 1), 2016, http://planning.lacity.org/StaffRpt/MND/ENV-2006-6302-MND-REC1.pdf, accessed August 4, 2023.

Sepulveda LLC Apartments Project, City of Los Angeles (Case No. ENV-2016-2752-MND), 2016, https://planning.lacity.org/StaffRpt/InitialRpts/CPC-2016-2751.PDF, accessed August 4, 2023.

Morgan Knolls Subdivision, Placer County, California, 2018, https://www.placer.ca.gov/DocumentCenter/View/32554/Morgan-Knolls-Tentative-Subdivision-Map-and-Variance---Extension-of-Time-20130316-PDF, accessed August 4, 2023.

Quail Cove Subdivision Project, Antioch, California, 2018, https://www.antiochca.gov/fc/community-development/planning/QuailCove/QuailCoveISMND.pdf, accessed August 4, 2023.

Texas Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants

Data is current as of December 31, 2019

Listed by County, NAAQS, Area. The 8-hour Ozone (1997) standard was revoked on April 6, 2015 and the 1-hour Ozone (1979) standard was revoked on June 15, 2005.

* The 1997 Primary Annual PM-2.5 NAAQS (level of 15 μg/m^3) is revoked in attainment and maintenance areas for that NAAQS. For additional information see the PM-2.5 NAAQS SIP Requirements Final Rule, effective October 24, 2016. (81 FR 58009)

Change the State: TEXAS GO

Important Notes

Download National Dataset: dbf | xls | Data dictionary (PDF)

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Cl
TEXAS					
Anderson County	Sulfur Dioxide (2010)	Freestone and Anderson Counties, TX	17 18 19	/ /	
Bexar County	8-Hour Ozone (2015)	San Antonio, TX	18 19	/ /	
Brazoria County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Brazoria County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Brazoria County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Brazoria County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Chambers County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Chambers County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Chambers County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Chambers County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Collin County	1-Hour Ozone (1979)-NAAQS revoked	Dallas-Fort Worth, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Collin County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Cl
Collin County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Collin County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Collin County	Lead (1978)	Collin Co, TX	92 93 94 95 96 97 98	12/13/1999	
Collin County	Lead (2008)	Frisco, TX	10 11 12 13 14 15 16	09/27/2017	
Dallas County	1-Hour Ozone (1979)-NAAQS revoked	Dallas-Fort Worth, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Dallas County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Dallas County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Dallas County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Denton County	1-Hour Ozone (1979)-NAAQS revoked	Dallas-Fort Worth, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Denton County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Denton County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Denton County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
El Paso County	1-Hour Ozone (1979)-NAAQS revoked	El Paso, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
El Paso County	Carbon Monoxide (1971)	El Paso, TX	92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07	10/03/2008	M
El Paso County	PM-10 (1987)	El Paso Co, TX	92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19	/ /	
Ellis County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Ellis County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Ellis County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Fort Bend County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Fort Bend County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Fort Bend County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Fort Bend County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Freestone County	Sulfur Dioxide (2010)	Freestone and Anderson Counties, TX	17 18 19	/ /	

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Cl
Galveston County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Galveston County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Galveston County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Galveston County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Hardin County	1-Hour Ozone (1979)-NAAQS revoked	Beaumont-Port Arthur, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Hardin County	8-Hour Ozone (1997)-NAAQS revoked	Beaumont-Port Arthur, TX	04 05 06 07 08 09	11/19/2010	
Harris County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Harris County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Harris County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Harris County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Jefferson County	1-Hour Ozone (1979)-NAAQS revoked	Beaumont-Port Arthur, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Jefferson County	8-Hour Ozone (1997)-NAAQS revoked	Beaumont-Port Arthur, TX	04 05 06 07 08 09	11/19/2010	
Johnson County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Johnson County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Johnson County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Kaufman County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Kaufman County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Kaufman County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Liberty County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Cl
Liberty County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Liberty County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Montgomery County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Montgomery County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Montgomery County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Montgomery County	8-Hour Ozone (2015)	Houston-Galveston-Brazoria, TX	18 19	/ /	
Orange County	1-Hour Ozone (1979)-NAAQS revoked	Beaumont-Port Arthur, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Orange County	8-Hour Ozone (1997)-NAAQS revoked	Beaumont-Port Arthur, TX	04 05 06 07 08 09	11/19/2010	
Panola County	Sulfur Dioxide (2010)	Rusk and Panola Counties, TX	17 18 19	/ /	
Parker County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Parker County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Parker County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Rockwall County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Rockwall County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Rusk County	Sulfur Dioxide (2010)	Rusk and Panola Counties, TX	17 18 19	/ /	
Tarrant County	1-Hour Ozone (1979)-NAAQS revoked	Dallas-Fort Worth, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Tarrant County	8-Hour Ozone (1997)-NAAQS revoked	Dallas-Fort Worth, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Tarrant County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Tarrant County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	
Titus County	Sulfur Dioxide (2010)	Titus County, TX	17 18 19	/ /	

County	NAAQS	Area Name	Nonattainment in Year	Redesignation to Maintenance	Cl
Victoria County	1-Hour Ozone (1979)-NAAQS revoked	Victoria, TX	92 93 94	05/08/1995	I
Waller County	1-Hour Ozone (1979)-NAAQS revoked	Houston-Galveston-Brazoria, TX	92 93 94 95 96 97 98 99 00 01 02 03 04	/ /	
Waller County	8-Hour Ozone (1997)-NAAQS revoked	Houston-Galveston-Brazoria, TX	04 05 06 07 08 09 10 11 12 13 14	/ /	
Waller County	8-Hour Ozone (2008)	Houston-Galveston-Brazoria, TX	12 13 14 15 16 17 18 19	/ /	
Wise County	8-Hour Ozone (2008)	Dallas-Fort Worth, TX	12 13 14 15 16 17 18 19	/ /	
Wise County	8-Hour Ozone (2015)	Dallas-Fort Worth, TX	18 19	/ /	

Important Notes

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2019-12-31

Coastal Zone Management

TEXAS GENERAL LAND OFFICE
COMMISSIONER DAWN BUCKINGHAM, M.D.

March 21, 2024

City of Richwood
P.O. Box 497
Point Comfort, TX 77978
ATTN: Todd Cave

Re: Flood and Drainage
2022-100107-RMP
Richwood, Brazoria County, Texas
CMP#: 24-1189-F5

Dear Mr. Cave:

Based on information provided to the Texas Coastal Management Program on the above project, it has been determined that it will likely not have adverse impacts on coastal natural resource areas (CNRAs) in the coastal zone. However, siting and construction should avoid and minimize impacts to CNRAs. If a U. S. Army Corps of Engineers permit is required, it will be subject to consistency review under the Texas Coastal Management Program.

Please forward this letter to applicable parties. If you have any questions or concerns, please contact me at (512) 463-7497 or at federal.consistency@glo.texas.gov.

Sincerely,

Leslie Koza

Leslie Koza
Federal Consistency Coordinator
Texas General Land Office

Todd Cave <todd@caveconsulting.com>

Richwood -Flood and Drainage - 2022-100107-RMP

1 message

Todd Cave <todd@texasenvironmentals.com> Sat, Feb 10, 2024 at 10:52 AM
To: Federal Consistency Federal Consistency <Federal.Consistency@glo.texas.gov>

Dear sirs,

The City of Richwood is considering a federally funded project (GLO - CDBG-MIT) to perform street, water and drainage improvements (see Map and Description).

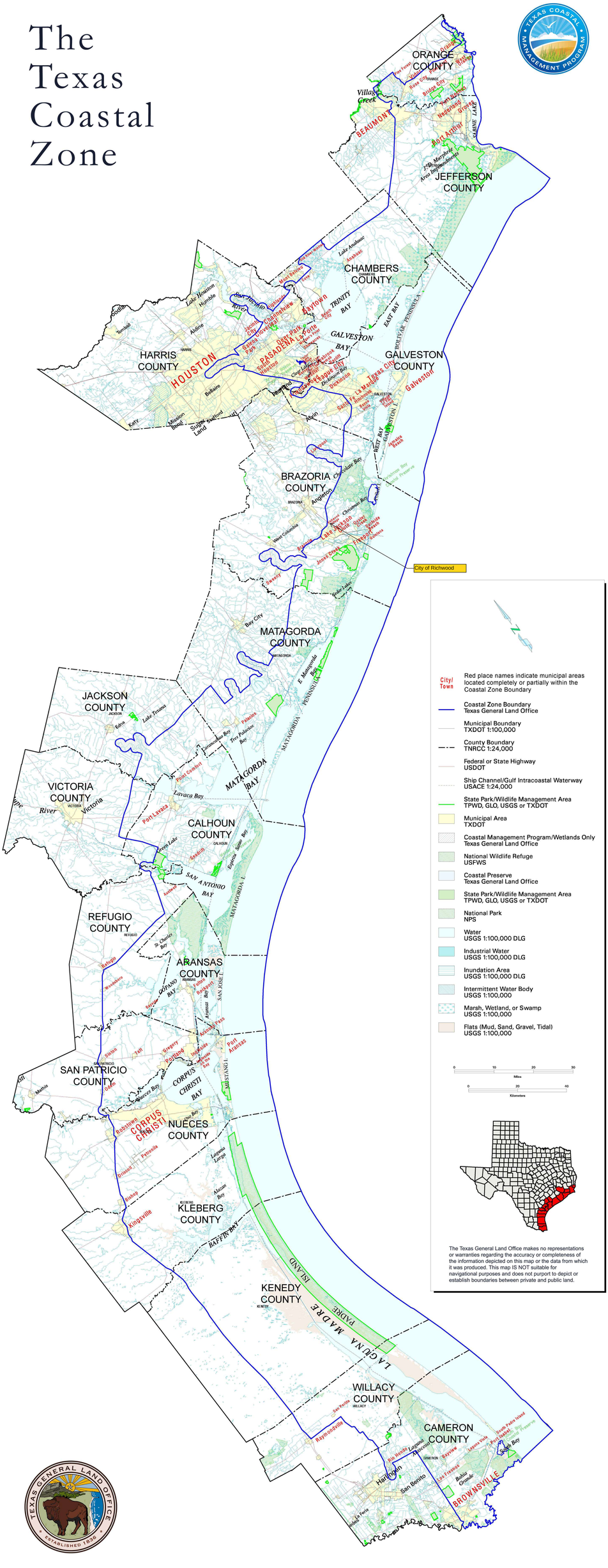
We would appreciate any comments you have as they pertain to compliance with Coastal Zone Management.

Thanks!

Todd Cave, President
(214) 307-4161
texasenvironmentals.com

Cave Consulting
HUD Environmental Specialists of Texas

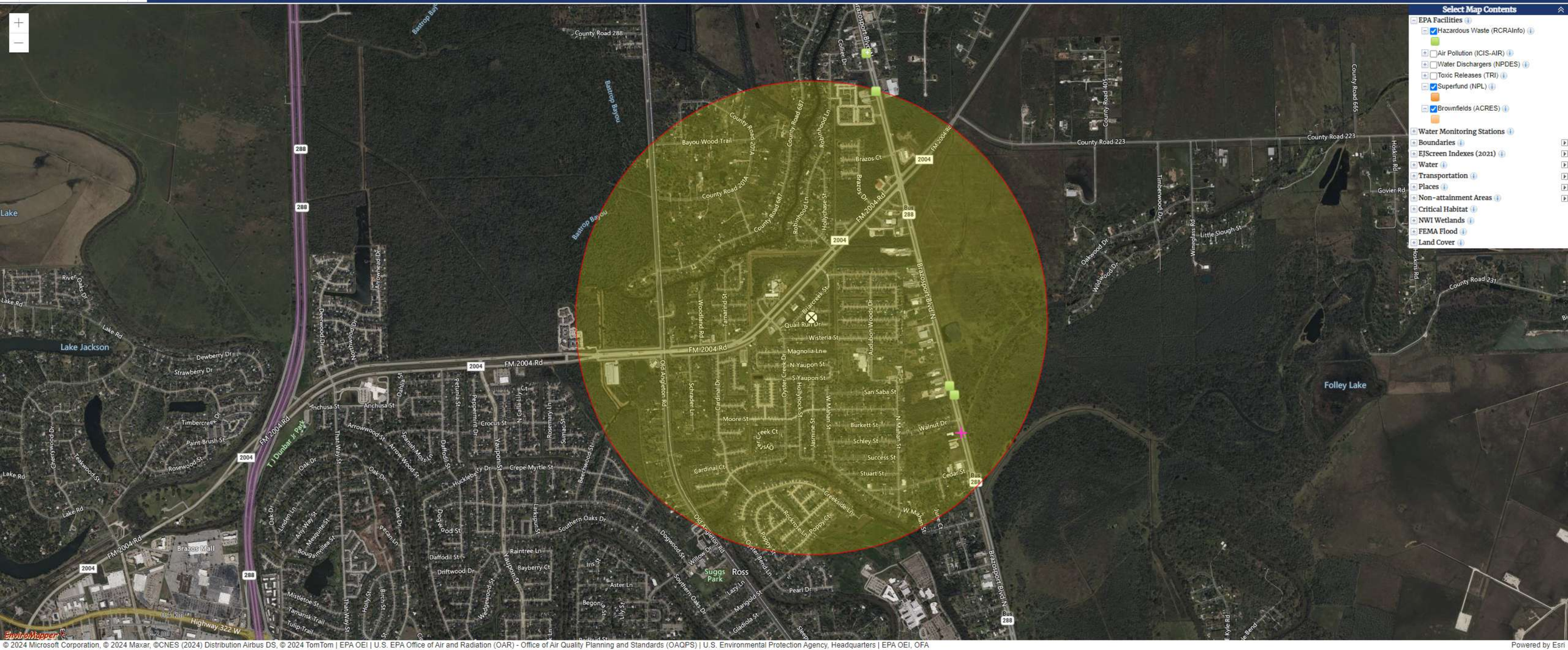
The Texas Coastal Zone



Contamination and Toxic Substances

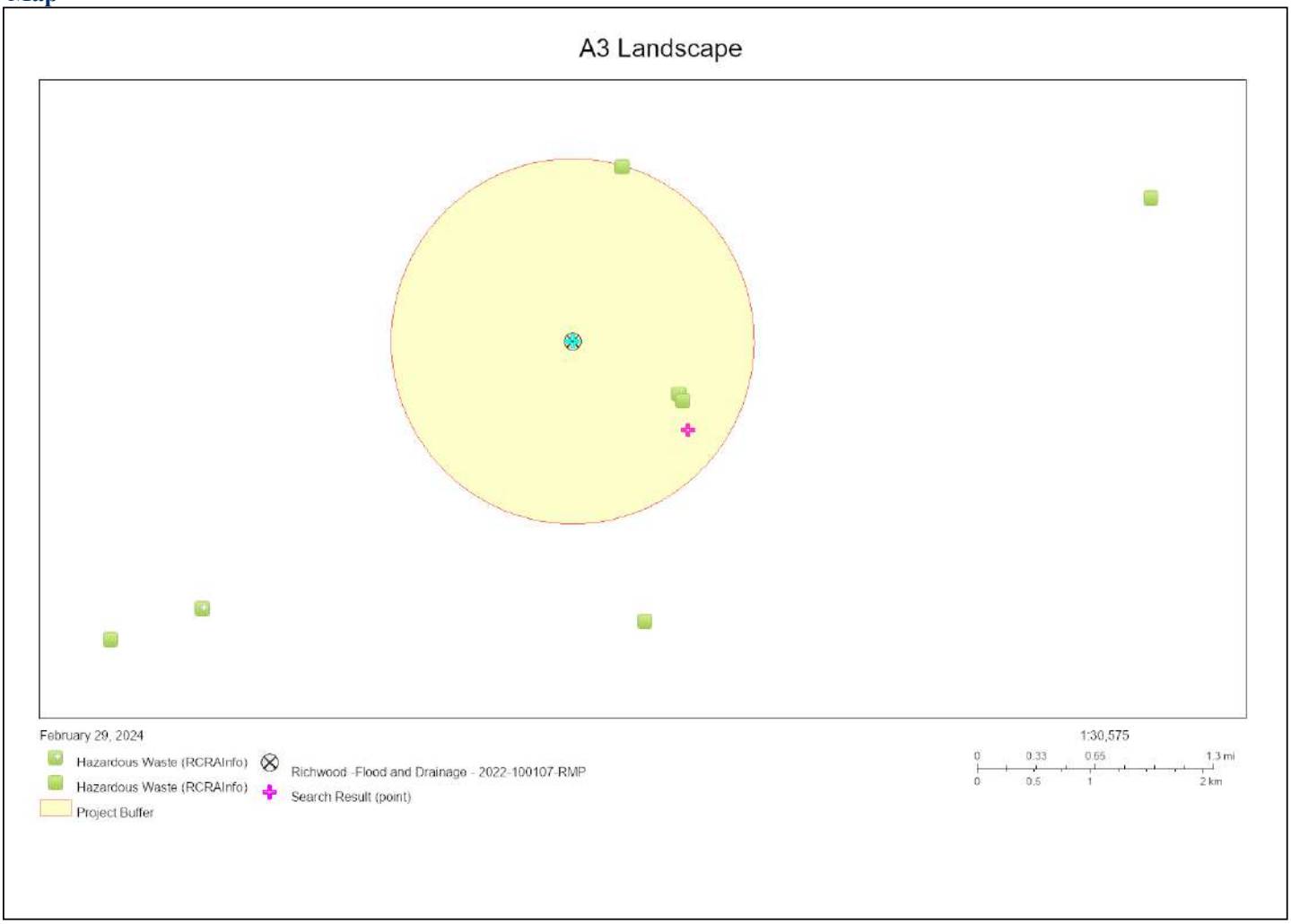
	Richwood -Flood and Drainage - 2022-100107-RMP				
	The following is a list of HAZMAT databases searched and the number of sites found within the indicated search radius.				
	Database Searched		**Search Distance (miles)**		**Number of Sites Found**
	Federal Databases				
	NPL Site List		1		0
	Delisted NPL sitre list		0.5		0
	CERCLIS list		0.5		0
	CERCLIS NFRAP site list		0.5		0
	RCRA CORRACTS facilities list		1		0
	RCRA CORRACTS TSD facilities list		0.5		0
	RCRA generators list		property and adjoining properties		0
	Institutional control/engineering control registries		property only		0
	State Databases				
	NPL		0.5		0
	CERCLIS		0.5		0
	Landfill and/or solid waste disposal site lists		0.5		0
	Closed Landfill List		0.5		0
	RCRA CORRACTS facilities list		1		0
	Leaking storage tank list		0.5		0
	Registered storage tank list		property and adjoining properties		0
	Institutional control/engineering control registeries		property only		0
	Brownfield Sites		0.5		0
	ERNS list		property only		0
	Voluntary Cleanup sites		0.5		0

NEPA Assist



Richwood -Flood and Drainage - 2022-100107-RMP

Map



Geographic coordinates:

POINT (29.066632,-95.416353)
with buffer 1.0 mile

Note: The information in the following reports is based on publicly available databases and web services. The National Report uses nationally available datasets and the State Reports use datasets available through the EPA Regions. Click on the hyperlinked question to view the data source and associated metadata.

National Report

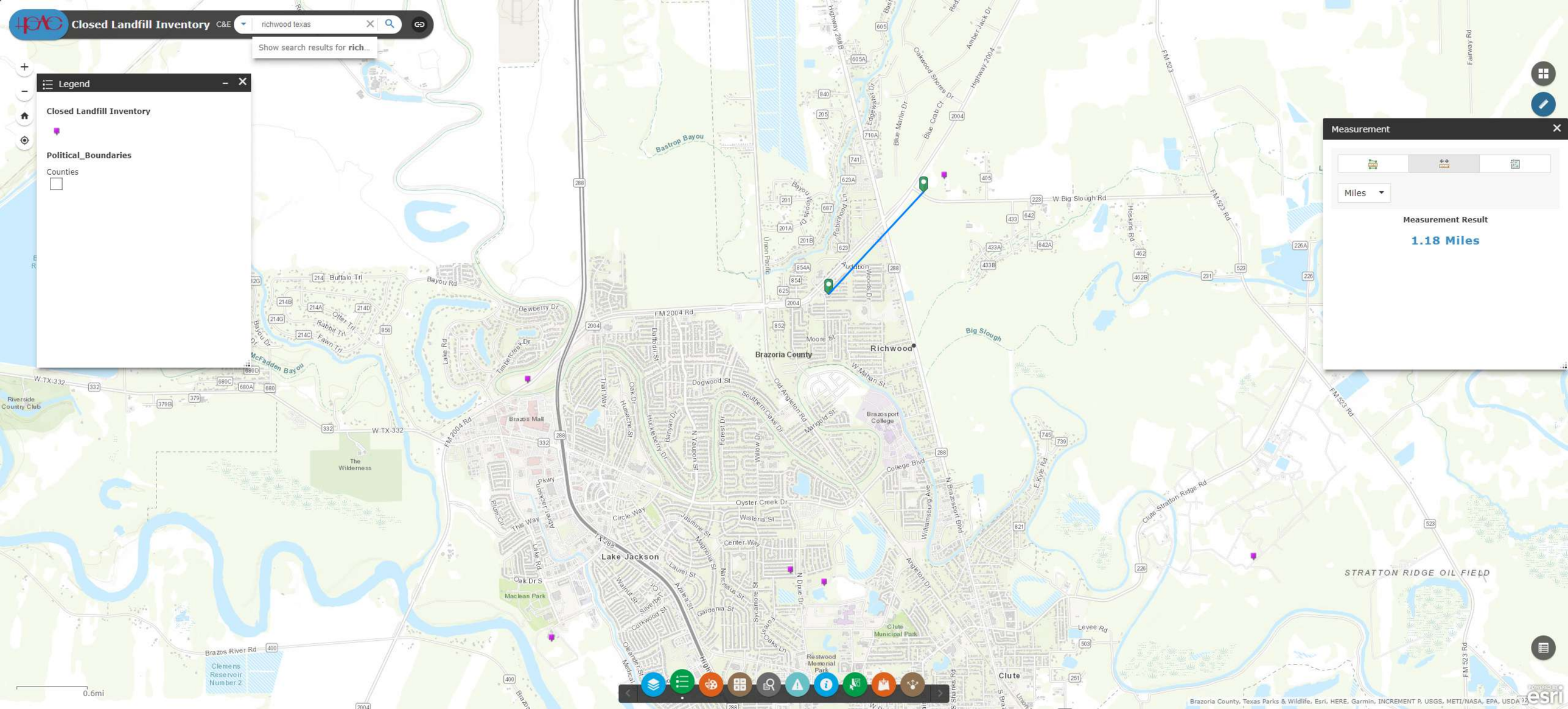
Project Location	29.066632,-95.416353
Within 1 mile of an Ozone 1-hr (1979 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of an Ozone 8-hr (1997 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of an Ozone 8-hr (2008 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of an Ozone 8-hr (2015 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of a Lead (2008 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a SO2 1-hr (2010 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM2.5 24hr (2006 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM2.5 Annual (1997 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM2.5 Annual (2012 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM10 (1987 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a CO Annual (1971 standard) Non-Attainment/Maintenance Area?	no

Within 1 mile of a NO2 Annual (1971 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a Federal Land?	yes
Within 1 mile of an impaired stream?	yes
Within 1 mile of an impaired waterbody?	no
Within 1 mile of a waterbody?	yes
Within 1 mile of a stream?	yes
Within 1 mile of an NWI wetland?	click here ***May take several minutes***
Within 1 mile of a Brownfields site?	no
Within 1 mile of a Superfund site?	no
Within 1 mile of a Toxic Release Inventory (TRI) site?	no
Within 1 mile of a water discharger (NPDES)?	no
Within 1 mile of a hazardous waste (RCRA) facility?	no
Within 1 mile of an air emission facility?	no
Within 1 mile of a school?	yes
Within 1 mile of an airport?	no
Within 1 mile of a hospital?	no
Within 1 mile of a designated sole source aquifer?	no
Within 1 mile of a historic property on the National Register of Historic Places?	no
Within 1 mile of a Land Cession Boundary?	no
Within 1 mile of a tribal area (lower 48 states)?	no
Within 1 mile of the service area of a mitigation or conservation bank?	yes
Within 1 mile of the service area of an In-Lieu-Fee Program?	no
Within 1 mile of a Public Property Boundary of the Formerly Used Defense Sites?	no
Within 1 mile of a Munitions Response Site?	no
Within 1 mile of an Essential Fish Habitat (EFH)?	no
Within 1 mile of a Habitat Area of Particular Concern (HAPC)?	no
Within 1 mile of an EFH Area Protected from Fishing (EFHA)?	no
Within 1 mile of a Bureau of Land Management Area of Critical Environmental Concern?	no
Within 1 mile of an ESA-designated Critical Habitat Area per U.S. Fish & Wildlife Service?	no
Within 1 mile of an ESA-designated Critical Habitat river, stream or water feature per U.S. Fish & Wildlife Service?	no

Save to Excel | Save as PDF

Texas Report
Demographic Reports
USFWS IPaC Report

Closed Landfills


Closed Landfill Inventory
C&E
richwood texas
Show search results for rich...
Legend
Closed Landfill Inventory
Political_Boundaries
Counties
Measurement
Miles
Measurement Result
1.18 Miles
Richwood
Brazoria County
Lake Jackson
Clute
Brazosport College
Brazos Mall
The Wilderness
Riverside Country Club
Clemens Reservoir Number 2
Maclean Park
Clute Municipal Park
Restwood Memorial Park
STRATTON RIDGE OIL FIELD
Bastrop Bayou
Big Slough
McFadden Bayou
Oyster Creek Dr
Wisteria St
Center Way
Circle Way
Dogwood St
Moore St
W Mahan St
College Blvd
W Big Slough Rd
FM 2004 Rd
W TX-332
Brazos River Rd
Levee Rd
Clute Stratton Ridge Rd
0.6mi
Brazoria County, Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, EPA, USDA

Endangered Species

Certification
Endangered Species
Environmental Review

Project Name: Richwood - Flood and Drainage - 24-065-013-E170
State/Local Identifier: 24-065-013-E170 / B-18-DP-48-0002

PROPOSED ACTION:
Project Location:
All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements

- Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30' south of Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. from Quail Run Dr. to Magnolia Ln.
- 4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements

- ROW from point 115' northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
- Briarcreek St. from Magnolia Ln . to Qual Run Dr.
- Quail Run Dr. from Oyster Creek Dr. east 1,230' (29.06615, -95.41464)
- 4 Oaks St from Briar Creek St. east 622 ' (29.06705, -95.41465)
- ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116' (29.06827, -95.4151)
- ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).
- ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
- ROW from point 14' northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. from point 40' northeast of 4 Oaks St. southwest 465' to point 100' northeast of Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. from Briarcreek St. east 622' (29.06705, -95.41465)
- Quail Run Dr. from point 260' east of Briarcreek St.(29.06613, -95.41673) east 650' (29.06615, -95.41464)
- ROW from point 260' east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).

- ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617, -95.41519)

Street Improvements

- Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
- Brian Creek St from 290' south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475'

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]:
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

FINDING:

Based on the proposed action, and my review of the performance statement in the grant contract, onsite inspection and photos, review of TPWD Listed Species and coordination with the USFWS, I, Todd Cave, have determined that the proposed action will have "no effect" on any federally or state-listed species or result in the destruction or adverse modification of critical habitats of plant and animal life, and no habitat for these species occurs within the proposed action site or adjacent area.

Todd Cave, ESP
Cave Consulting, Inc.

7/9/24

USFWS

Species Name - Common (Scientific)	Species Group	Listing Status	General Habitat Description*	Habitat Present
Richwood -Flood and Drainage - 2022-100107-RMP				
Federally Listed (http://www.fws.gov/southwest/es/EndangeredSpecies_Main.html)				
Tricolored Bat (*Perimyotis subflavus)*	Mammal	Endangered	During the winter, tricolored bats are found in caves and mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts. During the spring, summer and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves.	None of the habitat described is in the project area.
Eastern Black Rail Laterallus jamaicensis ssp. jamaice	Birds	Threatened	Eastern black rail habitat can be tidally or non-tidally influenced, and range in salinity from salt to brackish to fresh. Tidal height and volume vary greatly between the Atlantic and Gulf coasts and therefore contribute to differences in salt marsh cover plants in the bird's habitat.	None of the habitat described is in the project area.
Piping Plover (*Charadrius melodus*)	Birds	Threatened	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats	None of the habitat described is in the project area.
Red Knot (*Calidris canutus rufa*)	Birds	Threatened	Migrant of 1,500 miles or more twice annually. Requires stopover habitats rich in easily digested foods of small invertebrates with thin or no shells.	None of the habitat described is in the project area.
Whooping Crane Grus americana	Birds	Endangered	Whooping cranes winter on the Aransas National Wildlife Refuge's 22,500 acres of salt flats and marshes. The area's coastal prairie rolls gently here and is dotted with swales and ponds. They summer and nest in poorly drained wetlands in Canada's Northwest Territories at Wood Buffalo National Park.	None of the habitat described is in the project area.
Green Sea Turtle Chelonia mydas	Reptiles	Threatened	Green turtles primarily use three types of habitat: beaches for nesting; open ocean convergence zones; and coastal areas for "benthic" feeding	None of the habitat described is in the project area.
Hawksbill Sea Turtle Eretmochelys imbricata	Reptiles	Endangered	Hawksbills frequent rocky areas, coral reefs, shallow coastal areas, lagoons or oceanic islands, and narrow creeks and passes	None of the habitat described is in the project area.
Kemp's Ridley Sea Turtle Lepidochelys kempii	Reptiles	Endangered	Adult Kemp's primarily occupy "neritic" habitats. Neritic zones typically contain muddy or sandy bottoms where prey can be found.	None of the habitat described is in the project area.
Leatherback Sea Turtle Dermochelys coriacea	Reptiles	Endangered	Leatherbacks are commonly known as pelagic (open ocean) animals, but they also forage in coastal waters. Leatherbacks mate in the waters adjacent to nesting beaches and along migratory corridors. After nesting, female leatherbacks migrate from tropical waters to more temperate latitudes, which support high densities of jellyfish prey in the summer.	None of the habitat described is in the project area.
Loggerhead Sea Turtle Caretta caretta	Reptiles	Threatened	Loggerheads occupy three different ecosystems during their lives: beaches (terrestrial zone); water (oceanic zone); nearshore coastal areas ("neritic" zone)	None of the habitat described is in the project area.
Monarch Butterfly Danaus plexippus	Birds	Candidate	In the spring and summer, the monarch butterfly's habitat is open fields and meadows with milkweed. In winter it can be found on the coast of southern California and at high altitudes in central Mexico.	None of the habitat described is in the project area.
Migratory Birds	Birds	No migratory birds may occur at the subject property.		
Habitat Description from the TDPW County Species List and the USFWS IPAC.				

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal & Central Plains Esfo
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
Phone: (281) 286-8282 Fax: (281) 488-5882

In Reply Refer To: 03/27/2024 15:59:19 UTC
Project Code: 2024-0068908
Project Name: Richwood -Flood and Drainage - 2022-100107-RMP

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Corpus Christi, Fort Worth, and Alamo, Texas, have combined administratively to form the Texas Coastal Ecological Services Field Office. All project related correspondence should be sent to the field office address listed below responsible for the county in which your project occurs:

Project Leader; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058
Angelina, *Austin*, *Brazoria*, *Brazos*, *Chambers, Colorado, Fayette, Fort Bend, Freestone, Galveston, Grimes, Hardin, Harris, Houston, Jasper, Jefferson, Leon, Liberty, Limestone, Madison, Matagorda, Montgomery, Newton, Orange, Polk, Robertson, Sabine, San Augustine, San Jacinto, Trinity, Tyler, Walker, Waller, and Wharton.*

Assistant Field Supervisor, U.S. Fish and Wildlife Service; 4444 Corona Drive, Ste 215; Corpus Christi, Texas 78411
Aransas, Atascosa, Bee, Brooks, Calhoun, De Witt, Dimmit, Duval, Frio, Goliad, Gonzales, Hidalgo, Jackson, Jim Hogg, Jim Wells, Karnes, Kenedy, Kleberg, La Salle, Lavaca, Live Oak, Maverick, McMullen, Nueces, Refugio, San Patricio, Victoria, and Wilson.

U.S. Fish and Wildlife Service; Santa Ana National Wildlife Refuge; Attn: Texas Ecological Services Sub-Office; 3325 Green Jay Road, Alamo, Texas 78516
Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata.

For questions or coordination for projects occurring in counties not listed above, please contact arles@fws.gov.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your

proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/media/endangered-species-consultation-handbook.

Non-Federal entities may consult under Sections 9 and 10 of the Act. Section 9 and Federal regulations prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of

injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Should the proposed project have the potential to take listed species, the Service recommends that the applicant develop a Habitat Conservation Plan and obtain a section 10(a)(1)(B) permit. The Habitat Conservation Planning Handbook is available at: https://www.fws.gov/library/collections/habitat-conservation-planning-handbook.

Migratory Birds:
In addition to responsibilities to protect threatened and endangered species under the Act, there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts visit: https://www.fws.gov/program/migratory-birds.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable National Environmental Policy Act (NEPA) documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Texas Coastal & Central Plains Esfo
17629 El Camino Real, Suite 211
Houston, TX 77058-3051
(281) 286-8282

PROJECT SUMMARY

Project Code: 2024-0068908
Project Name: Richwood -Flood and Drainage - 2022-100107-RMP
Project Type: Disaster-related Grants
Project Description: All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements
Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30’ south of Quail Run Dr. (29.06613, -95.41513).
Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
Briar Creek St. from Quail Run Dr. to Magnolia Ln.
4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements
ROW from point 115’ northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
Briarcreek St. from Magnolia Ln . to Qual Run Dr.
Quail Run Dr. from Oyster Creek Dr. east 1,230’ (29.06615, -95.41464)
4 Oaks St from Briar Creek St. east 622 ‘ (29.06705, -95.41465)
ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116’ (29.06827, -95.4151)
ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).
ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
ROW from point 14’ northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
Briarcreek St. from point 40’ northeast of 4 Oaks St. southwest 465’ to point 100’ northeast of Quail Run Dr. (29.06642, -95.41737)
4 Oaks St. from Briarcreek St. east 622’ (29.06705, -95.41465)
Quail Run Dr. from point 260’ east of Briarcreek St.(29.06613, -95.41673) east 650’ (29.06615, -95.41464)
ROW from point 260’ east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).
ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617,

-95.41519)

Street Improvements
Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
Brian Creek St from 290’ south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475’

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]:
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

Construction activities include:

8,500square yards (SY) of 6-inch reinforced concrete pavement with concrete curb and gutter
9,200 SY of reworking base course material at an 8-inch minimum thickness
395 tons of lime stabilization of base material at an 8-inch minimum thickness
1,320 SY of 6-inch reinforced concrete driveway pavement
1,900 linear feet (LF) of storm sewer
15 curb inlets and storm sewer structures
4,100 LF of water main
48 water service lines
Six fire hydrants
Traffic control

Project will be complete within 18 months of start.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@29.06782655,-95.41605937888008,14z

Counties: Brazoria County, Texas

ENDANGERED SPECIES ACT SPECIES

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS	Threatened

NAME	STATUS

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/1110

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

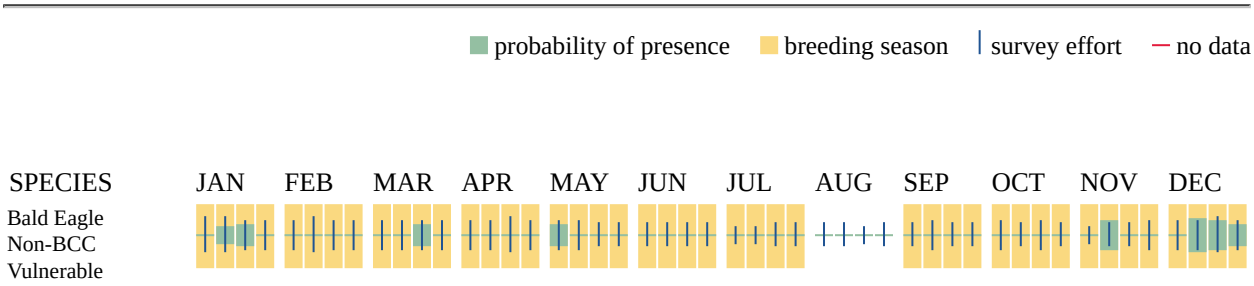
Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds

- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25

NAME	BREEDING SEASON
Dickcissel *Spiza americana* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9453	Breeds May 5 to Aug 31
Forster's Tern *Sterna forsteri* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/11953	Breeds Mar 1 to Aug 15
Gull-billed Tern *Gelochelidon nilotica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
King Rail *Rallus elegans* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Painted Bunting *Passerina ciris* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9511	Breeds Apr 25 to Aug 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10

NAME	BREEDING SEASON
Reddish Egret *Egretta rufescens* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/7617	Breeds Mar 1 to Sep 15
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10669	Breeds Apr 20 to Aug 5

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

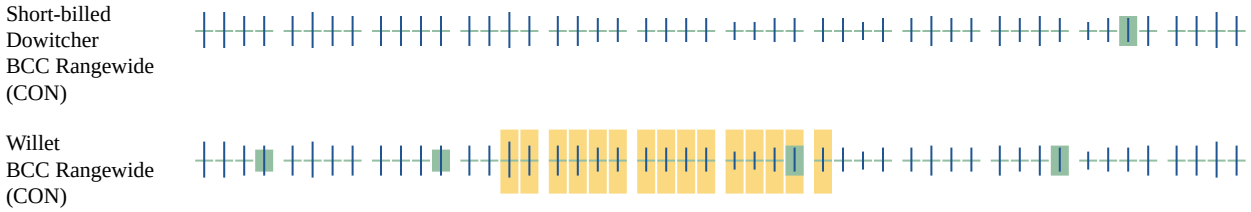
Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort – no data


SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Bald Eagle
Non-BCC
Vulnerable
Black Skimmer
BCC Rangewide
(CON)
Chimney Swift
BCC Rangewide
(CON)
Dickcissel
BCC - BCR
Forster's Tern
BCC - BCR
Gull-billed Tern
BCC Rangewide
(CON)
King Rail
BCC Rangewide
(CON)
Lesser Yellowlegs
BCC Rangewide
(CON)
Long-billed Curlew
BCC - BCR
Marbled Godwit
BCC Rangewide
(CON)
Painted Bunting
BCC - BCR
Pectoral Sandpiper
BCC Rangewide
(CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Red-headed
Woodpecker
BCC Rangewide
(CON)
Reddish Egret
BCC Rangewide
(CON)
Ruddy Turnstone
BCC - BCR



Additional information can be found using the following links:

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- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R4SBCx

IPAC USER CONTACT INFORMATION

Agency:	Cave Consulting Inc
Name:	Todd Cave
Address:	6060 N. Central Expressway
Address Line 2:	5th Floor
City:	Dallas
State:	TX
Zip:	75206
Email	todd@caveconsulting.com
Phone:	2144692483

TPWD

Last Update: 9/1/2023

BRAZORIA COUNTY

AMPHIBIANS

southern crawfish frog *Lithobates areolatus areolatus*

Terrestrial and aquatic: The terrestial habitat is primarily grassland and can vary from pasture to intact prairie; it can also include small prairies in the middle of large forested areas. Aquatic habitat is any body of water but preferred habitat is ephemeral wetlands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S3

Strecker's chorus frog *Pseudacris streckeri*

Terrestrial and aquatic: Wooded floodplains and flats, prairies, cultivated fields and marshes. Likes sandy substrates.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Woodhouse's toad *Anaxyrus woodhousii*

Terrestrial and aquatic: A wide variety of terrestrial habitats are used by this species, including forests, grasslands, and barrier island sand dunes. Aquatic habitats are equally varied.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: SU

BIRDS

bald eagle *Haliaeetus leucocephalus*

Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3B,S3N

black rail *Laterallus jamaicensis*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous years dead grasses; nest usually hidden in marsh grass or at base of Salicornia

Federal Status: T	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

black skimmer *Rynchops niger*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B

BRAZORIA COUNTY

BIRDS

Franklin's gull *Leucophaeus pipixcan*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. This species is only a spring and fall migrant throughout Texas. It does not breed in or near Texas. Winter records are unusual consisting of one or a few individuals at a given site (especially along the Gulf coastline). During migration, these gulls fly during daylight hours but often come down to wetlands, lake shore, or islands to roost for the night.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2N

piping plover *Charadrius melodus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Beaches, sandflats, and dunes along Gulf Coast beaches and adjacent offshore islands. Also spoil islands in the Intracoastal Waterway. Based on the November 30, 1992 Section 6 Job No. 9.1, Piping Plover and Snowy Plover Winter Habitat Status Survey, algal flats appear to be the highest quality habitat. Some of the most important aspects of algal flats are their relative inaccessibility and their continuous availability throughout all tidal conditions. Sand flats often appear to be preferred over algal flats when both are available, but large portions of sand flats along the Texas coast are available only during low-very low tides and are often completely unavailable during extreme high tides or strong north winds. Beaches appear to serve as a secondary habitat to the flats associated with the primary bays, lagoons, and inter-island passes. Beaches are rarely used on the southern Texas coast, where bayside habitat is always available, and are abandoned as bayside habitats become available on the central and northern coast. However, beaches are probably a vital habitat along the central and northern coast (i.e. north of Padre Island) during periods of extreme high tides that cover the flats. Optimal site characteristics appear to be large in area, sparsely vegetated, continuously available or in close proximity to secondary habitat, and with limited human disturbance.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2N

reddish egret *Egretta rufescens*

Resident of the Texas Gulf Coast; brackish marshes and shallow salt ponds and tidal flats; nests on ground or in trees or bushes, on dry coastal islands in brushy thickets of yucca and prickly pear

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S2B

rufa red knot *Calidris canutus rufa*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and Tidal flat/shore. Bolivar Flats in Galveston County, sandy beaches Mustang Island, few on outer coastal and barrier beaches, tidal mudflats and salt marshes.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4T2	State Rank: S2N

Sprague's pipit *Anthus spragueii*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Habitat during migration and in winter consists of pastures and weedy fields (AOU 1983), including grasslands with dense herbaceous vegetation or grassy agricultural fields.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3N

BRAZORIA COUNTY

BIRDS

swallow-tailed kite *Elanoides forficatus*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Lowland forested regions, especially swampy areas, ranging into open woodland; marshes, along rivers, lakes, and ponds; nests high in tall tree in clearing or on forest woodland edge, usually in pine, cypress, or various deciduous trees.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2B

western burrowing owl *Athene cunicularia hypugaea*

Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4T4	State Rank: S2

white-faced ibis *Plegadis chihi*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; currently confined to near-coastal rookeries in so-called hog-wallow prairies. Nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4B

white-tailed hawk *Buteo albicaudatus*

Near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S4B

whooping crane *Grus americana*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Small ponds, marshes, and flooded grain fields for both roosting and foraging. Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1S2N

BRAZORIA COUNTY

BIRDS

wood stork *Mycteria americana*

The county distribution for this species includes geographic areas that the species may use during migration. Time of year should be factored into evaluations to determine potential presence of this species in a specific county. Prefers to nest in large tracts of baldcypress (Taxodium distichum) or red mangrove (Rhizophora mangle); forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SHB,S2N

CRUSTACEANS

Brazoria crayfish *Procambarus brazoriensis*

The species is found in roadside ditches. In droughts, animals may burrow into substrate. The type locality is described as a ditch beside a road. The ditch was 100 m long and one metre wide which commonly contains water up to 0.3 m deep although does dry completely when there is no rain (Albaugh, 1975).

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S1

FISH

alligator gar *Atractosteus spatula*

From the Red River to the Rio Grande (Hubbs et al. 2008); occurs in the Trinity River upstream of Lake Livingston. Found in rivers, streams, lakes, swamps, bayous, bays and estuaries typically in pools and backwater habitats. Floodplains inundated with flood waters provide spawning and nursery habitats.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S4

oceanic whitetip shark *Carcharhinus longimanus*

Habitat description is not available at this time.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2

opossum pipefish *Microphis brachyurus*

Adults are only found in low salinity waters of estuaries or freshwater tributaries within 30 miles of the coast (Gilmore 1992), where they also give birth. Young move or are carried into more saline waters off the coast after birth. Newly released larvae must have conditions near 18 ppt salinity for at least two weeks after birth to survive, indicating a physiology adapted for downstream transport to estuarine and marine environments (Frias-Torres 2002). Juvenile migration toward the ocean depends on water flow regimes, salinity, and vegetation for cover and capturing prey (Frias-Torres 2002). Seawalls, docks, and riprap construction destroy habitat and poor water quality and alteration of flow regimes may prevent migration (NMFS 2009).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3N

BRAZORIA COUNTY

FISH

saltmarsh topminnow *Fundulus jenkinsi*

Occupies estuaries and the edges of saltmarsh habitats along the Gulf coast in salinities of 4-20 ppt in Spartina dominated tidal creeks and wetlands (Peterson & Ross 1991; Peterson & Turner 1994; Lopez et al. 2010; and Griffith 1974). Requires access to small interconnected tidal creeks for feeding and reproduction. Spawning occurs from March to August during high tide events (Robertson Thesis, 2016). Non-migratory.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S1

shortfin mako shark *Isurus oxyrinchus*

Habitat description is not available at this time.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: GNR	State Rank: S2

silverband shiner *Notropis shumardi*

In Texas, found from Red River to Lavaca River; Main channel with moderate to swift current velocities and moderate to deep depths; associated with turbid water over silt, sand, and gravel.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

southern flounder *Paralichthys lethostigma*

This is an estuarine-dependent species that inhabits riverine, estuarine and coastal waters, and prefers muddy, sandy, or silty substrates (Reagan and Wingo 1985). Individuals can tolerate wide temperature (~5-35°C) and salinity ranges (0-60 ppt). Southern Flounder spawn in offshore waters of the Gulf of Mexico from October to February (Reagan and Wingo 1985). The oceanic larval stage is pelagic and lasts 30–60 days. Metamorphosing individuals enter estuaries and migrate towards low-salinity headwaters, where settlement occurs (Burke et al. 1991, Walsh et al. 1999). The young fish enter the bays during late winter and early spring, occupying seagrass; some may move further into coastal rivers and bayous. Juveniles remain in estuaries until the onset of sexual maturation (approximately two years), at which time they migrate out of estuaries to join adults on the inner continental shelf. Adult southern flounder leave the bays during the fall for spawning in the Gulf of Mexico. They spawn for the first time when two years old at depths of 50 to 100 feet. Although most of the adults leave the bays and enter the Gulf for spawning during the winter, some remain behind and spend winter in the bays. Those in the Gulf will reenter the bays in the spring. The spring influx is gradual and does not occur with large concentrations that characterize the fall emigration.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

INSECTS

American bumblebee *Bombus pensylvanicus*

Habitat description is not available at this time.

Federal Status:	State Status:	SGCN: Y
Endemic:	Global Rank: G3G4	State Rank: SNR

MAMMALS

big brown bat *Eptesicus fuscus*

Any wooded areas or woodlands except south Texas. Riparian areas in west Texas.

BRAZORIA COUNTY

MAMMALS

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G5 | State Rank: S5

big free-tailed bat *Nyctinomops macrotis*

Habitat data sparse but records indicate that species prefers to roost in crevices and cracks in high canyon walls, but will use buildings, as well; reproduction data sparse, gives birth to single offspring late June-early July; females gather in nursery colonies; winter habits undetermined, but may hibernate in the Trans-Pecos; opportunistic insectivore

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G5 | State Rank: S3

blue whale *Balaenoptera musculus*

Inhabits tropical, subtropical, temperate, and subpolar waters worldwide, but are infrequently sighted in the Gulf of Mexico. They migrate seasonally between summer feeding grounds and winter breeeding grounds, but specifics vary. Commonly observed at the surface in open ocean.

Federal Status: LE | State Status: E | SGCN: Y
Endemic: N | Global Rank: G3G4 | State Rank: SH

eastern red bat *Lasiurus borealis*

Red bats are migratory bats that are common across Texas. They are most common in the eastern and central parts of the state, due to their requirement of forests for foliage roosting. West Texas specimens are associated with forested areas (cottonwoods). Also common along the coastline. These bats are highly mobile, seasonally migratory, and practice a type of "wandering migration". Associations with specific habitat is difficult unless specific migratory stopover sites or wintering grounds are found. Likely associated with any forested area in East, Central, and North Texas but can occur statewide.

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G3G4 | State Rank: S4

eastern spotted skunk *Spilogale putorius*

Generalist; open fields prairies, croplands, fence rows, farmyards, forest edges & woodlands. Prefer wooded, brushy areas & tallgrass prairies. S.p. ssp. interrupta found in wooded areas and tallgrass prairies, preferring rocky canyons and outcrops when such sites are available.

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G4 | State Rank: S1S3

Gulf of Mexico Bryde's whale *Balaenoptera ricei*

Habitat description is not available at this time.

Federal Status: LE | State Status: E | SGCN: N
Endemic: N | Global Rank: G1 | State Rank: SNR

BRAZORIA COUNTY

MAMMALS

hoary bat *Lasiurus cinereus*

Hoary bats are highly migratory, high-flying bats that have been noted throughout the state. Females are known to migrate to Mexico in the winter, males tend to remain further north and may stay in Texas year-round. Commonly associated with forests (foliage roosting species) but are found in unforested parts of the state and lowland deserts. Tend to be captured over water and large, open flyways.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3

humpback whale *Megaptera novaeangliae*

Inhabits tropical, subtropical, temperate, and subpolar waters world wide. Migrate up to 5,000 miles between colder water (feeding grounds) and warmer water (calving grounds) each year. They will use both open ocean and coastal waters, sometimes including inshore areas such as bays, and are often found near the surface; however, this species is rare in the Gulf of Mexico. The northwest Atlantic/Gulf of Mexico distinct population segment is not considered at risk of extinction and is not listed as Endangered on the Endangered Species Act.

Federal Status: LE	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: SNR

long-tailed weasel *Mustela frenata*

Includes brushlands, fence rows, upland woods and bottomland hardwoods, forest edges & rocky desert scrub. Usually live close to water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

mountain lion *Puma concolor*

Generalist; found in a wide range of habitats statewide. Found most frequently in rugged mountains & riparian zones.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

North Atlantic right whale *Eubalaena glacialis*

Inhabits subtropical and temperate waters in the northern Atlantic. Commonly found in coastal waters or clsoe to the continental shelf near the surface. They migrate from feeding grounds in cooler waters (Canada and New England) to warmer waters of the southeast US (South Carolina, Georgia, and Florida) to give birth in the fall/winter - both areas are identified as critical habitat by NOAA-NMFS. Nursery areas are in shallow, coastal waters. This species is very rare in the Gulf of Mexico and the few reported sightings are likely vagrants (Ward-Geiger etal 2011).

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G1	State Rank: S1

northern yellow bat *Lasiurus intermedius*

Occurs mainly along the Gulf Coast but inland specimens are not uncommon. Prefers roosting in spanish moss and in the hanging fronds of palm trees. Common where this vegtation occurs. Found near water and forages over grassy, open areas. Males usually roost solitarily, whereas females roost in groups of several individuals.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S4

BRAZORIA COUNTY

MAMMALS

Rafinesque's big-eared bat *Corynorhinus rafinesquii*

Historically, lowland pine and hardwood forests with large hollow trees. roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

sei whale *Balaenoptera borealis*

Habitat description is not available at this time.

Federal Status: LE	State Status: E	SGCN: N
Endemic: N	Global Rank: G5?	State Rank: SNR

southeastern myotis bat *Myotis austroriparius*

Caves are rare in Texas portion of range; buildings, hollow trees are probably important. Historically, lowland pine and hardwood forests with large hollow trees; associated with ecological communities near water. Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3?

sperm whale *Physeter macrocephalus*

Inhabits tropical, subtropical, and temperate waters world wide, avoiding icey waters. Distribution is highly dependent on their food source (squids, sharks, skates, and fish), breeding, and composition of the pod. In general, this species migrates from north to south in the winter and south to north in the summer; however, individuals in tropical and temperate waters don't seem to migrate at all. Routinely dive to catch their prey (2,000-10,000 feet) and generally occupies water at least 3,300 feet deep near ocean trenches.

Federal Status: LE	State Status: E	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S1

swamp rabbit *Sylvilagus aquaticus*

Primarily found in lowland areas near water including: cypress bogs and marshes, floodplains, creeks and rivers.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S5

tricolored bat *Perimyotis subflavus*

Forest, woodland and riparian areas are important. Caves are very important to this species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S2

BRAZORIA COUNTY

MAMMALS

West Indian manatee *Trichechus manatus*

Large rivers, brackish water bays, coastal waters. Warm waters of the tropics, in rivers and brackish bays but may also survive in salt water habitats. Very sensitive to cold water temperatures. Rarely occurring as far north as Texas. Gulf and bay system; opportunistic, aquatic herbivore.

Federal Status: LT	State Status: T	SGCN: Y
Endemic: N	Global Rank: G2G3	State Rank: S1

MOLLUSKS

Brazos heelsplitter *Potamilus streckersoni*

Reported from streams, but not far into the headwaters, to large rivers, and some reservoirs. In riverine systems occurs most often in nearshore habitats such as banks and backwater pools but occasionally in mainchannel habitats such as riffles. Typically found in standing to slow-flowing water in soft substrates consisting of silt, mud or sand but occasionally in moderate flows with gravel and cobble substrates (Randklev et al. 2014b,c; Tsakiris and Randklev 2016b; Smith et al. 2019) [Mussels of Texas 2020]

Federal Status:	State Status: T	SGCN: Y
Endemic: Y	Global Rank: GNR	State Rank: SNR

Texas fawnsfoot *Truncilla macrodon*

Occurs in large rivers but may also be found in medium-sized streams. Is found in protected near shore areas such as banks and backwaters but also riffles and point bar habitats with low to moderate water velocities. Typically occurs in substrates of mud, sandy mud, gravel and cobble. Considered intolerant of reservoirs (Randklev et al. 2010; Howells 2010o; Randklev et al. 2014b,c; Randklev et al. 2017a,b). [Mussels of Texas 2019]

Federal Status: PT	State Status: T	SGCN: Y
Endemic: Y	Global Rank: G1	State Rank: S2

REPTILES

alligator snapping turtle *Macrochelys temminckii*

Aquatic: Perennial water bodies; rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near running water; sometimes enters brackish coastal waters. Females emerge to lay eggs close to the waters edge.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S2

eastern box turtle *Terrapene carolina*

Terrestrial: Eastern box turtles inhabit forests, fields, forest-brush, and forest-field ecotones. In some areas they move seasonally from fields in spring to forest in summer. They commonly enters pools of shallow water in summer. For shelter, they burrow into loose soil, debris, mud, old stump holes, or under leaf litter. They can successfully hibernate in sites that may experience subfreezing temperatures.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

BRAZORIA COUNTY

REPTILES

green sea turtle *Chelonia mydas*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Adults and juveniles occupy inshore and nearshore areas, including bays and lagoons with reefs and seagrass. They migrate from feeding grounds (open ocean) to nesting grounds (beaches/barrier islands) and some nesting does occur in Texas (April to September). Adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds.

Federal Status: LT | State Status: T | SGCN: Y
Endemic: N | Global Rank: G3 | State Rank: S3B,S3N

Kemp's Ridley sea turtle *Lepidochelys kempii*

Inhabits tropical, subtropical, and temperate waters of the northwestern Atlantic Ocean and Gulf of Mexico. Adults are found in coastal waters with muddy or sandy bottoms. Some males migrate between feeding grounds and breeeding grounds, but some don't. Females migrate between feeding and nesting areas, often returning to the same destinations. Nesting in Texas occurs on a smaller scale compared to other areas (i.e. Mexico). Hatchlings are quickly swept out to open water and are rarely found nearshore. Similarly, juveniles often congregate near floating algae/seagrass mats offshore, and move into nearshore, coastal, neritic areas after 1-2 years and remain until they reach maturity. They feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August.

Federal Status: LE | State Status: E | SGCN: Y
Endemic: N | Global Rank: G1 | State Rank: S3

leatherback sea turtle *Dermochelys coriacea*

Inhabit tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. Nesting is not common in Texas (March to July). Most pelagic of the seaturtles with the longest migration (>10,000 miles) between nesting and foraging sites. Are able to dive to depths of 4,000 feet. They are omnivorous, showing a preference for jellyfish.

Federal Status: LE | State Status: E | SGCN: Y
Endemic: N | Global Rank: G2 | State Rank: S1S2

loggerhead sea turtle *Caretta caretta*

Inhabits tropical, subtropical, and temperate waters worldwide, including the Gulf of Mexico. They migrate from feeding grounds to nesting beaches/barrier islands and some nesting does occur in Texas (April to September). Beaches that are narrow, steeply sloped, with coarse-grain sand are preffered for nesting. Newly hatched individuals depend on floating alage/seaweed for protection and foraging, which eventually transport them offshore and into open ocean. Juveniles and young adults spend their lives in open ocean, offshore before migrating to coastal areas to breed and nest. Foraging areas for adults include shallow continental shelf waters.

Federal Status: LT | State Status: T | SGCN: Y
Endemic: N | Global Rank: G3 | State Rank: S4

prairie skink *Plestiodon septentrionalis*

The prairie skink can occur in any native grassland habitat across the Rolling Plains, Blackland Prairie, Post Oak Savanna and Pineywoods ecoregions.

Federal Status: | State Status: | SGCN: Y
Endemic: N | Global Rank: G5 | State Rank: S2

BRAZORIA COUNTY

REPTILES

pygmy rattlesnake *Sistrurus miliarius*

The pygmy rattlesnake occurs in a variety of wooded habitats from bottomland coastal hardwood forests to upland savannas. The species is frequently found in association with standing water.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S2S3

salt marsh snake *Nerodia clarkii*

This species is generally restricted to the brackish marshes and islands of the mid and upper coastline. It can be found further inland in shallow freshwater marshes.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S3

slender glass lizard *Ophisaurus attenuatus*

Terrestrial: Habitats include open grassland, prairie, woodland edge, open woodland, oak savannas, longleaf pine flatwoods, scrubby areas, fallow fields, and areas near streams and ponds, often in habitats with sandy soil.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

smooth softshell *Apalone mutica*

Aquatic: Large rivers and streams; in some areas also found in lakes and impoundments (Ernst and Barbour 1972). Usually in water with sandy or mud bottom and few aquatic plants. Often basks on sand bars and mudflats at edge of water. Eggs are laid in nests dug in high open sandbars and banks close to water, usually within 90 m of water (Fitch and Plummer 1975).

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

Texas diamondback terrapin *Malaclemys terrapin littoralis*

Coastal marshes, tidal flats, coves, estuaries, and lagoons behind barrier beaches; brackish and salt water; burrows into mud when inactive. Bay islands are important habitats. Nests on oyster shell beaches.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G4T3	State Rank: S2

Texas garter snake *Thamnophis sirtalis annectens*

Terrestrial and aquatic: Habitats used include the grasslands and modified open areas in the vicinity of aquatic features, such as ponds, streams or marshes. Damp soils and debris for cover are thought to be critical.

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G5T4	State Rank: S1

BRAZORIA COUNTY

REPTILES

Texas horned lizard *Phrynosoma cornutum*

Terrestrial: Open habitats with sparse vegetation, including grass, prairie, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive. Occurs to 6000 feet, but largely limited below the pinyon-juniper zone on mountains in the Big Bend area.

Federal Status:	State Status: T	SGCN: Y
Endemic: N	Global Rank: G4G5	State Rank: S3

timber (canebrake) rattlesnake *Crotalus horridus*

Terrestrial: Swamps, floodplains, upland pine and deciduous woodland, riparian zones, abandoned farmland. Limestone bluffs, sandy soil or black clay. Prefers dense ground cover, i.e. grapevines, palmetto.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G4	State Rank: S4

western box turtle *Terrapene ornata*

Terrestrial: Ornate or western box trutles inhabit prairie grassland, pasture, fields, sandhills, and open woodland. They are essentially terrestrial but sometimes enter slow, shallow streams and creek pools. For shelter, they burrow into soil (e.g., under plants such as yucca) (Converse et al. 2002) or enter burrows made by other species.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5	State Rank: S3

western chicken turtle *Deirochelys reticularia miaria*

Aquatic and terrestrial: This species uses aquatic habitats in the late winter, spring and early summer and then terrestrial habitats the remainder of the year. Preferred aquatic habitats seem to be highly vegetated shallow wetlands with gentle slopes. Specific terrestrial habitats are not well known.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5T5	State Rank: S2S3

western massasauga *Sistrurus tergeminus*

Terrestrial: Shortgrass or mixed grass prairie, with gravel or sandy soils. Often found associated with draws, floodplains, and more mesic habitats within the arid landscape. Frequently occurs in shrub encroached grasslands.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3G4	State Rank: S3

PLANTS

coastal gay-feather *Liatris bracteata*

Coastal prairie grasslands of various types, from salty prairie on low- lying somewhat saline clay loams to upland prairie on nonsaline clayey to sandy loams; flowering in fall

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2G3	State Rank: S2S3

BRAZORIA COUNTY

PLANTS

corkwood *Leitneria pilosa ssp. pilosa*

Wet or saturated silty soils along brackish or freshwater swamps and ponds and other low, poorly drained sites; flowers in early spring, fruiting as early as May

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2G3T2	State Rank: S2

giant sharpstem umbrella-sedge *Cyperus cephalanthus*

In Texas on saturated, fine sandy loam soils, along nearly level fringes of deep prairie depressions; also in depressional area within coastal prairie remnant on heavy black clay; in Louisiana, most sites are coastal prairie on poorly drained sites, some on slightly elevated areas surrounded by standing shallow water, and on moderately drained sites; soils include very strongly acid to moderately alkaline silt loams and silty clay loams; flowering/fruiting May-June, August-September, and possibly other times in response to rainfall

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3?Q	State Rank: S1

Heller's marbleseed *Onosmodium helleri*

Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; Perennial; Flowering March-May

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Runyon's water-willow *Justicia runyonii*

Margins of and openings within subtropical woodlands or thorn shrublands on calcareous, alluvial, silty or clayey soils derived from Holocene silt and sand floodplain deposits of the Rio Grande Delta; can be common in narow openings such as those provided by trails through dense ebony woodlands and is sometimes restricted to microdepressions; flowering (July-) September-November

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G2	State Rank: S2

South Texas false cudweed *Pseudognaphalium austrotexanum*

In sandy grasslands on eroded area above saline flats; along edge of sendero through mesquite woodland and shrub mottes on sandy loam; on gravel and silt bars and flats in scour plain of streams (TEX-LL specimens Carr 23682, 29264, 22647, 27206). Oct-Jan, sometimes in spring.

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G3	State Rank: S3

South Texas spikesedge *Eleocharis austrotexana*

Occurring in miscellaneous wetlands at scattered locations on the coastal plain; Perennial; Flowering/Fruiting Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Sutherland hawthorn *Crataegus viridis var. glabriuscula*

In mesic soils of woods or on edge of woods, treeline/fenceline, or thicket. Above\near creeks and draws, in river bottoms. Flowering Mar-Apr; fruiting May-Oct.

BRAZORIA COUNTY

PLANTS

Federal Status:	State Status:	SGCN: Y
Endemic: N	Global Rank: G5T3T4	State Rank: S3

Texas meadow-rue *Thalictrum texanum*

Mostly found in woodlands and woodland margins on soils with a surface layer of sandy loam, but it also occurs on prairie pimple mounds; both on uplands and creek terraces, but perhaps most common on claypan savannas; soils are very moist during its active growing season; flowering/fruiting (January-)February-May, withering by midsummer, foliage reappears in late fall(November) and may persist through the winter

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2Q	State Rank: S2

Texas pinkroot *Spigelia texana*

Woodlands on loamy soils; Perennial; Flowering March-Nov; Fruiting April-Nov

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Texas sunflower *Helianthus praecox ssp. praecox*

Sandy open areas along the upper Texas coast; Annual; Flowering April-Sept

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G4T2	State Rank: S2

Texas tauschia *Tauschia texana*

Occurs in loamy soils in deciduous forests or woodlands on river and stream terraces; Perennial; Flowering/Fruiting Feb-April

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Texas willkommia *Willkommia texana var. texana*

Mostly in sparsely vegetated shortgrass patches within taller prairies on alkaline or saline soils on the Coastal Plain (Carr 2015).

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3G4T3	State Rank: S3

Texas windmill grass *Chloris texensis*

Sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes; flowering in fall

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2	State Rank: S2

BRAZORIA COUNTY

PLANTS

threeflower broomweed *Thurovia triflora*

Near coast in sparse, low vegetation on a veneer of light colored silt or fine sand over saline clay along drier upper margins of ecotone between between salty prairies and tidal flats; further inland associated with vegetated slick spots on prairie mima mounds; flowering September-November

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G2G3	State Rank: S2S3

Traub's rainlily *Cooperia traubii*

Primarily sandy loam, open fields, coastal plains. Flowering early summer--mid fall (Jul--Nov) (Flagg, Smith & Flory 2002).

Federal Status:	State Status:	SGCN: Y
Endemic: Y	Global Rank: G3	State Rank: S3

Explosive and Flammable Hazards

Explosive and Flammable Hazards (CEST and EA)

General requirements	Legislation	Regulation
HUD-assisted projects must meet Acceptable Separation Distance (ASD) requirements to protect them from explosive and flammable hazards.	N/A	24 CFR Part 51 Subpart C
Reference		
https://www.hudexchange.info/environmental-review/explosive-and-flammable-facilities		

1. **Does the proposed HUD-assisted project include a hazardous facility (a facility that mainly stores, handles or processes flammable or combustible chemicals such as bulk fuel storage facilities and refineries)?**

   X No

   → *Continue to Question 2.*

   ☐ Yes

   Explain:

   → *Continue to Question 5.*

2. **Does this project include any of the following activities: development, construction, rehabilitation that will increase residential densities, or conversion?**

   X No

   → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

   ☐ Yes

   → *Continue to Question 3.*

3. **Within 1 mile of the project site, are there any current *or planned* stationary aboveground storage containers:**
   - Of more than 100 gallon capacity, containing common liquid industrial fuels OR
   - Of any capacity, containing hazardous liquids or gases that are not common liquid industrial fuels?

   ☐ No

   → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide all documents used to make your determination.*

☐ Yes

→ *Continue to Question 4.*

4. **Is the Separation Distance from the project acceptable based on standards in the Regulation?**

   Please visit HUD's website for information on calculating Acceptable Separation Distance.

   ☐ Yes

   → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide map(s) showing the location of the project site relative to any tanks and your separation distance calculations. If the map identifies more than one tank, please identify the tank you have chosen as the "assessed tank."*

   ☐ No

   → *Provide map(s) showing the location of the project site relative to any tanks and your separation distance calculations. If the map identifies more than one tank, please identify the tank you have chosen as the "assessed tank."*
   Continue to Question 6.

5. **Is the hazardous facility located at an acceptable separation distance from residences and any other facility or area where people may congregate or be present?**

   Please visit HUD's website for information on calculating Acceptable Separation Distance.

   ☐ Yes

   → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations.*

   ☐ No

   → *Provide map(s) showing the location of the project site relative to residences and any other facility or area where people congregate or are present and your separation distance calculations.*
   Continue to Question 6.

6. **For the project to be brought into compliance with this section, all adverse impacts must be mitigated. Explain in detail the exact measures that must be implemented to make the Separation Distance acceptable, including the timeline for implementation. If negative effects cannot be mitigated, cancel the project at this location.**

   Note that only licensed professional engineers should design and implement blast barriers. If a barrier will be used or the project will be modified to compensate for an

unacceptable separation distance, provide approval from a licensed professional engineer.

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

The proposed HUD-assisted project does not include a hazardous facility (a facility that mainly stores, handles or processes flammable or combustible chemicals such as bulk fuel storage facilities and refineries) and does not include any of the following activities: development, construction, rehabilitation that will increase residential densities, or conversion.

Are formal compliance steps or mitigation required?

☐ Yes

X No

Todd Cave <todd@caveconsulting.com>

Floodway Memo

4 messages

Warner, Kelly S <Kelly.S.Warner@hud.gov> Thu, Aug 15, 2019 at 11:58 AM
To: "todd@caveconsulting.com" <todd@caveconsulting.com>

Hi Todd,

It was good to see you again at TDA's training. We talked briefly about the floodway situation that David touched on in his presentation and I wanted to follow up with a copy of the memo (attached). Let me know if you have any questions and I hope this helps!

Sincerely,

Kelly Warner

Field Environmental Officer, Region VI

U.S. Department of Housing and Urban Development

Office of Environment and Energy

801 Cherry St., Unit#45, Suite 2500

Fort Worth, Texas 76102

(817) 978-5622

Environmental Review Website

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Todd Cave <todd@caveconsulting.com> Fri, Aug 16, 2019 at 9:07 AM
To: "Warner, Kelly S" <Kelly.S.Warner@hud.gov>

Kelly,

It was great visiting with you again!

I will look this memo over and let you know if I have any questions.

On another note, the subject of Explosive Facilities came up after you left. As I have understood it, acceptable distance comes into play when you are dealing with projects that involve habitable structures or places where people congregate. So, for example, upgrading a lift station or replacing sewer line would not be subject to the acceptable distance requirement.

However, at the TDA training, it was mentioned that any project which involved "workers" would be subject to this rule due to OSHA safety requirements. This is the first I have heard of this and I do not believe NEPA speaks to OSHA.

Do you have any guidance on this? It would be much appreciated!

Thanks!

Todd Cave, Founding Partner - (COO)
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[Quoted text hidden]

Warner, Kelly S <Kelly.S.Warner@hud.gov> Fri, Aug 16, 2019 at 9:56 AM
To: Todd Cave <todd@caveconsulting.com>
Cc: "Myers, Laura L" <Laura.L.Myers@hud.gov>

Hi Todd,

Your understanding is correct. The HUD reg under Part 51 Subpart C refers to HUD-assisted projects “intended for residential, institutional, recreational, commercial, or industrial use.” Installation or rehab of the lift station wouldn’t trigger the ASD requirements for workers. However, just wanted to mention that if a generator with an associated above-ground fuel source is being installed at the lift station, then you would need to do the ASD for any residences/facilities in the area.

I’ve cc’d Laura Myers on this email since she is the FEO assigned to TDA and may have additional guidance to offer.

Hope this helps!

[Quoted text hidden]

Todd Cave <todd@caveconsulting.com> Fri, Aug 16, 2019 at 9:58 AM
To: "Warner, Kelly S" <Kelly.S.Warner@hud.gov>
Cc: "Myers, Laura L" <Laura.L.Myers@hud.gov>

Thank you for the clarification.

Have a great day / weekend!

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Farmlands Protection

Farmlands Protection (CEST and EA)

General requirements	Legislation	Regulation
The Farmland Protection Policy Act (FPPA) discourages federal activities that would convert farmland to nonagricultural purposes.	Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 et seq.)	7 CFR Part 658
Reference		
https://www.hudexchange.info/environmental-review/farmlands-protection		

1. **Does your project include any activities, including new construction, acquisition of undeveloped land or conversion, that could convert agricultural land to a non-agricultural use?**

   ☐Yes → *Continue to Question 2.*

   X No

   Explain how you determined that agricultural land would not be converted:

   Review of the project description indicated work includes improving existing water, drainage and streets facilities within existing rights-of-way.

   → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documentation supporting your determination.*

2. **Does "important farmland," including prime farmland, unique farmland, or farmland of statewide or local importance regulated under the Farmland Protection Policy Act, occur on the project site?**

   You may use the links below to determine important farmland occurs on the project site:

   - Utilize USDA Natural Resources Conservation Service's (NRCS) Web Soil Survey http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm
   - Check with your city or county's planning department and ask them to document if the project is on land regulated by the FPPA (zoning important farmland as non-agricultural does not exempt it from FPPA requirements)
   - Contact NRCS at the local USDA service center http://offices.sc.egov.usda.gov/locator/app?agency=nrcs or your NRCS state soil scientist http://soils.usda.gov/contact/state_offices/ for assistance

   ☐No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide any documents used to make your determination.*

   ☐Yes → *Continue to Question 3.*

3. **Consider alternatives to completing the project on important farmland and means of avoiding impacts to important farmland.**

- Complete form **AD-1006**, "Farmland Conversion Impact Rating" http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045394.pdf and contact the state soil scientist before sending it to the local NRCS District Conservationist.

(NOTE: for corridor type projects, use instead form **NRCS-CPA-106**, "Farmland Conversion Impact Rating for Corridor Type Projects: http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045395.pdf.)

- Work with NRCS to minimize the impact of the project on the protected farmland. When you have finished with your analysis, return a copy of form AD-1006 (or form NRCS-CPA-106 if applicable) to the USDA-NRCS State Soil Scientist or his/her designee informing them of your determination.

Document your conclusion:

☐Project will proceed with mitigation.

Explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide form AD-1006 and all other documents used to make your determination.*

☐Project will proceed without mitigation.

Explain why mitigation will not be made here:

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide form AD-1006 and all other documents used to make your determination.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

The project does not include activities including new construction, acquisition of undeveloped land or conversion, that could convert agricultural land to non-agricultural land.

Are formal compliance steps or mitigation required?

☐ Yes

X No

Floodplain Management

U.S. Department of Housing and Urban Development:

8-Step Process - Floodplain

Project Name: Richwood - Flood and Drainage - 24-065-013-E170
State/Local Identifier: 24-065-013-E170 / B-18-DP-48-0002

Project Location:
All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements

- Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30' south of Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. from Quail Run Dr. to Magnolia Ln.
- 4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements

- ROW from point 115' northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
- Briarcreek St. from Magnolia Ln . to Qual Run Dr.
- Quail Run Dr. from Oyster Creek Dr. east 1,230' (29.06615, -95.41464)
- 4 Oaks St from Briar Creek St. east 622 ' (29.06705, -95.41465)
- ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116' (29.06827, -95.4151)
- ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).
- ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
- ROW from point 14' northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. from point 40' northeast of 4 Oaks St. southwest 465' to point 100' northeast of Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. from Briarcreek St. east 622' (29.06705, -95.41465)
- Quail Run Dr. from point 260' east of Briarcreek St.(29.06613, -95.41673) east 650' (29.06615, -95.41464)
- ROW from point 260' east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).
- ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617, -95.41519)

Street Improvements

- Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
- Brian Creek St from 290’ south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475’

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

Step 1: ***Determine whether the action is located in a FFRMS floodplain.***

According to FEMA floodplain map #48039C0610K (Effective Date 12/30/20), the project is located in FEMA Zone AE (100-year floodplain).

According to FFSST, based on the user-defined location, service life (36 Years), and non-critical designation, the proposed action is in the FFRMS floodplain.

The 2050 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88.

The 2060 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88.

The North American Vertical Datum of 1988 (NAVD88) is the datum used on FEMA Digital Flood Insurance Rate Maps (DFIRMs) for Base Flood Elevations (BFEs).

Projects located in the FFRMS floodplain should be designed consistent with the applicable policies and directives of the agency taking or approving the action.

The area of disturbance: 3.84 acres.

Exemptions to Part 55:
Actions listed in the revised 24 CFR 55.12 that are exempt from the floodplain management requirements of Part 55 include:

- *Exempt activities and actions that are Categorically Excluded Not Subject to 50.4 or 58.5*
- *Restoration or preservation of floodplains, acquisition of floodplains property provided the site is used for flood control or open space but only if structures are cleared and improvements are specifically limited*
- *Receivership or foreclosure and related actions*
- *Policy-level actions not involving site-based work*
- *Issuance of non-project-based housing vouchers*
- *A minor amendment to a previously approved action*

<u>The project is subject to Part 55 because it meets the criteria for none of the exemptions.</u>

Critical Actions:
Critical action means any activity for which even a slight chance of flooding would be too great because such flooding might result in loss of life, injury to persons, or damage to property. Critical actions include activities that create, maintain, or extend the useful life of those structures or facilities that:

- *Produce, use, or store highly volatile, flammable, explosive, toxic, or water-reactive materials*
- *Provide essential and irreplaceable records or utility or emergency services that may become lost or inoperative during flood and storm events (e.g., community stormwater management infrastructure, water treatment plants, data storage centers, generating plants, principal utility lines, emergency operations centers including fire and police stations, and roadways providing sole egress from flood-prone areas)*
- *Are likely to contain occupants who may not be sufficiently mobile to avoid loss of life or injury during flood or storm events, e.g., persons who reside in hospitals, nursing homes, convalescent homes, intermediate care facilities, board and care facilities, and retirement service centers; housing for independent living for the elderly is not considered a critical action*

Because the project meets none of the above criteria, it is not considered a critical action.

Step 2: ***Notify the public for early review of the proposal and involve the affected and interested public in the decision making process.***

There are designated floodplains associated with the proposed project sites. An early floodplain notice was published regarding the project, affording the opportunity for public input. No comments were received.

Posting Date: 6/28/24

Step 3: ***Identify and evaluate practicable alternatives.***

The City project site selection criteria are:

(a) The project cannot cause current residents to become displaced;
(b) The project must be within the City in order for grant proceeds to be used;
(c) The project must address infrastructure which was damaged due to recent flooding.

The City considered several alternative sites and actions:

1. **Do only work outside the 100-year floodplain**. - It is not possible to complete the project outside the 100-year floodplain.

2. **Obtain a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR**). - The City also considered applying for a LOMA Map Amendment or Letter of Map Revision but it was determined that this site would not be a good candidate for such action and the time required to request such action could not be justified.

3. **Other infrastructure considered. -** Other infrastructure projects were also considered within the City Jurisdictional limits. However, the City concluded that this project was the highest priority of any eligible projects.

4. **No Action or Alternative Actions that Serve the Same Purpose. -** A no-action alternative was considered but the infrastructure to be addressed is currently not functioning properly which could pose a health hazard to the community.

Step 4: ***Identify Potential Direct and Indirect Impacts of Associated with Floodplain Development.***

1. Preventing loss of life and property as a result of flooding is the highest priority. A flood could damage the new infrastructure.

2. In addition to concerns for life and property, the City has considered the natural values of the floodplain. The natural resources of the floodplain include water, biological, and societal resources. The proposed project will have minimal impacts to the floodplains because appropriate mitigation will be in place.

3. After review of the County Lists of Endangered and Threatened Species for the County, on-site inspections of the project site, and consultation with the USFWS and TPWD, it was concluded that the construction of the facilities will have no quantifiable impact on plant and animal life. Only native plants are to be used in the floodplain and on the site.

4. Societal resources should also be considered during the design process. The designs are meant to complement the natural features of the area and to offer an aesthetically pleasing structure. The site will not have an effect on agricultural lands.

Step 5: ***Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the floodplain and to restore, and preserve the values of the floodplain.***

1. Preserving Property: Project designs should, to the best extent possible, incorporate measures to reduce the risk of damage to the new infrastructure via a flood.
2. Preserving Natural Values and Minimizing Impacts: After construction is completed, the disturbed area will need to be immediately re-vegetated with native grasses. Only native plants are to be used in the floodplain and on the site.
3. Deposition and excavation of materials will need to be performed in such a manner that erosion and sedimentation will be controlled.
4. Precautions will need to be taken in the handling of fuels or other hazardous materials to prevent discharge or spillage resulting in lower groundwater quality.
5. Erosion control measures such as hay bales or silt screen barriers will need to be implemented and maintained during construction as required.
6. The project engineer will need to incorporate best management practices into the specifications and plans.

Mitigation Requirements:
CFR 55.20 (e)(1):
For actions in the FFRMS floodplain, the required elevation described in this section must be documented on an Elevation Certificate or a Floodproofing Certificate in the Environmental Review Record prior to construction, or by such other means as HUD may from time to time direct, provided that notwithstanding any language to the contrary, the minimum elevation or floodproofing requirement for new construction or substantial improvement actions shall be the elevation of the FFRMS floodplain as defined in this section.

Non-Critical Actions
CFR 55.7(d)(1):

- The FFRMS floodplain includes those areas that result from adding an additional two feet to the base flood elevation based on best available information.

Critical Actions
CFR 55.7(d)(2):

- The FFRMS floodplain includes those areas that result from adding an additional three feet to the base flood elevation based on best available information.

Applicable Projects
According to the HUD Exchange on Floodplain Management (Complying with 24 CFR Part 55 (2)), if a project involves new construction or substantial improvement, elevation requirements apply.

Substantial Improvement:
A substantial improvement is any repair, reconstruction, modernization or improvement of a structure, including one of the following:

1. The cost of which equals or exceeds 50 percent of the market value of the structure either before the improvement or repair is started, or, if the structure has been damaged and is being restored, before the damage occurred
2. That results in an increase of more than 20 percent in the number of dwelling units in a residential project or in the average peak number of customers and employees likely to be on-site at any one time for a commercial or industrial project

Certain types of projects are specifically not considered substantial improvement under Part 55.

- Any project solely for improvement of a structure to comply with existing state or local health, sanitary or safety code specifications that is solely necessary to assure safe living conditions
- Any alteration of a structure listed on the National Register of Historical Places or on a State Inventory of Historic Places
- Structural repairs, reconstruction, or improvements not meeting the definition for substantial improvement are considered "minor improvements."

Because this project is not considered a structure, elevation requirements do not apply.

Step 6: ***Reevaluate the Alternatives.***

1. **Do only work outside the 100-year floodplain.** - The infrastructure to be addressed is located within 100-year floodplains and must be addressed. (Not Viable)

2. **Obtain a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR**). - It was determined that neither a LOMA nor a LOMR was likely nor practical for the project area. (Not Viable)

3. **Other infrastructure considered. -** After considering other potential projects in the City, it was determined that of the eligible projects, this project was of the highest priority. (Not Viable)

4. **No Action or Alternative Actions that Serve the Same Purpose. -** The infrastructure to be addressed is inadequate for the area and must be addressed to prevent public health hazards. (Not Viable)

Step 7: ***Determination of No Practicable Alternative***

It is our determination that there are no practical alternatives for locating the project in the floodplain.

A final notice was published detailing the reasons why the project must be located in the floodplain, a list of *alternatives* considered, and all mitigation measures taken to minimize adverse impacts and preserve natural and beneficial floodplain values. No concerns were expressed by the public concerning this notice.

Posting Date: 7/18/24

Step 8: ***Implement the Proposed Action***

The City will assure that this plan, as modified and described above, is executed and necessary language will be included in all agreements with participating parties. The City will also take an active role in monitoring the construction process to ensure no unnecessary impacts occur nor unnecessary risks are taken.

Richwood – Flood and Drainage -Notice1 – Spanish

Richwood Flood Maps

Final Notice and Public Explanation of a Proposed Activity in a Floodplain.

HUD 8-Step Process – Floodplain

Richwood – Flood and Drainage – Notice 2

Richwood – Flood and Drainage – Notice 2 – Spanish

Final Notice and Public Explanation of a Proposed Activity in a Floodplain

To: All interested Agencies, Groups and Individuals

This is to give notice that the **City of Richwood** has conducted an evaluation as required by Executive Order 11988, in accordance with HUD regulations at 24 CFR 55.20 Subpart C Procedures for Making Determinations on Floodplain Management. The activity is funded under the HUD CDBG Disaster Recovery Program under **#24-065-013-E170 / B-18-DP-48-0002, Richwood - Flood and Drainage - 24-065-013-E170.**

Project Location:
All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements

- Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30' south of Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. from Quail Run Dr. to Magnolia Ln.
- 4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements

- ROW from point 115' northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
- Briarcreek St. from Magnolia Ln. to Qual Run Dr.
- Quail Run Dr. from Oyster Creek Dr. east 1,230' (29.06615, -95.41464)
- 4 Oaks St from Briar Creek St. east 622 '(29.06705, -95.41465)
- ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116' (29.06827, -95.4151)
- ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).
- ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
- ROW from point 14' northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. from point 40' northeast of 4 Oaks St. southwest 465' to point 100' northeast of Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. from Briarcreek St. east 622' (29.06705, -95.41465)
- Quail Run Dr. from point 260' east of Briarcreek St. (29.06613, -95.41673) east 650' (29.06615, -95.41464)
- ROW from point 260' east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).
- ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617, -95.41519)

Street Improvements

- Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
- Brian Creek St from 290' south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475'

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]:
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

FLOODPLAIN
According to FEMA floodplain map #48039C0610K (Effective Date 12/30/20), the project is located in FEMA Zone AE (100-year floodplain). According to FFSST, based on the user-defined location, service life (36 Years), and non-critical designation, the proposed action is in the FFRMS floodplain.

The 2050 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88. The 2060 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88. The North American Vertical Datum of 1988 (NAVD88) is the datum used on FEMA Digital Flood Insurance Rate Maps (DFIRMs) for Base Flood Elevations (BFEs). Projects located in the FFRMS floodplain should be designed consistent with the applicable policies and directives of the agency taking or approving the action.

The area of disturbance: 3.84 acres.

WOTUS
According to the Wetlands/Waters of the U.S. Delineation Report completed for this project, the following was concluded:

No wetlands are located within the project area. One potentially jurisdictional intermittent stream (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) are located within the project area. Provided the proposed stormwater outfall from the new storm sewer system will be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and there is no fill material placed below the OHWM of the channel, no Section 404 permit will be required for the project. Should the project design change, impacts to WOTUS should be re-evaluated to determine whether a Section 404 permit is required.

Natural Values of the Floodplain:
The natural resources of the floodplain include water, biological, and societal resources. The proposed project will have minimal impacts to the floodplains because appropriate mitigation will be in place.

The **City of Richwood** has considered the following alternatives and mitigation measures to be taken to minimize adverse impacts and to restore and preserve natural and beneficial values:

1. Do only work outside the 100-year floodplain. - The infrastructure to be addressed is located within 100-year floodplains and must be addressed. (Not Viable)
2. Obtain a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR). - It was determined that neither a LOMA nor a LOMR was likely nor practical for the project area. (Not Viable)
3. Other infrastructure considered. - After considering other potential projects in the City, it was determined that of the eligible projects, this project was of the highest priority. (Not Viable)
4. No Action or Alternative Actions that Serve the Same Purpose. - The infrastructure to be addressed is inadequate for the area and must be addressed to prevent public health hazards. (Not Viable)

Mitigation measures to be taken to minimize adverse impacts and to restore and preserve natural and beneficial values:

- Preserving Property: Project designs should, to the best extent possible, incorporate measures to reduce the risk of damage to the new infrastructure via a flood.
- Preserving Natural Values and Minimizing Impacts: After construction is completed, the disturbed area will need to be immediately re-vegetated with native grasses. Only native plants are to be used in the floodplain and on the site.
- Deposition and excavation of materials will need to be performed in such a manner that erosion and sedimentation will be controlled.
- Precautions will need to be taken in the handling of fuels or other hazardous materials to prevent discharge or spillage resulting in lower groundwater quality.
- Erosion control measures such as hay bales or silt screen barriers will need to be implemented and maintained during construction as required.
- The project engineer will need to incorporate best management practices into the specifications and plans.

Date of any final or conditional LOMR's or LOMA's from FEMA: None requested.

The **City of Richwood** will ensure applicable state and local floodplain protection procedures are followed. The **City of Richwood** has reevaluated the alternatives to building in the floodplain and has determined that it has no practicable alternative. Environmental files that document compliance with steps 3 through 6 of Executive Order 11988, are available for public inspection, review and copying upon request at the times and location delineated in the last paragraph of this notice for receipt of comments.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains and those who have an interest in the protection of the natural environment should be given an opportunity to express their concerns and provide information about these areas. Second, an adequate public notice program can be an important public educational tool. The dissemination of information and request for public comment about floodplains can facilitate and enhance Federal efforts to reduce the risks and impacts associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the Federal government determines it will participate in actions taking place in floodplains, it must inform those who may be put at greater or continued risk.

Written comments must be received by the **City of Richwood** at the following address on or before **July 26, 2024** a minimum 7 calendar day comment period will begin the day after the publication and end on the 8th day after the publication: **City of Richwood City Hall 1800 Brazosport Blvd N, Richwood, TX 77531 and 972-265-2082.** A full description of the project may also be reviewed from 9:00 am to 5:00 pm from the previously mentioned address. Comments may also be submitted via email at todd@texasenvironmentals.com.

Date: July 18, 2024

Aviso final y explicación pública de una actividad propuesta en una llanura aluvial

Para: Todas las agencias interesadas, Grupos e individuos

Esto es para dar aviso de que la **ciudad de Richwood** ha realizado una evaluación según lo exige la Orden Ejecutiva 11988, en conformidad con las regulaciones del HUD en 24 CFR 55.20 Subparte C Procedimientos para tomar determinaciones sobre llanuras aluviales Gestión. La actividad está financiada por el Programa de recuperación de desastres CDBG de HUD bajo **#24-065-013-E170 / B-18-DP-48-0002, Richwood - Inundaciones y drenaje - 24-065-013-E170.**

Ubicación del proyecto:
Todo el trabajo se realizará en la ciudad de Richwood, condado de Brazoria, Texas, en las siguientes ubicaciones:

Mejoras del agua

- Magnolia Ln. desde el lado norte de Audubon Woods Dr. (29.06938, -95.41544) hacia el sur por ROW hasta el punto 30' al sur de Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. desde Oyster Creek Dr. hasta ROW alineado con Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. desde Quail Run Dr. hasta Magnolia Ln.
- 4 Oaks St. desde Briar Creek St. hacia el este hasta la FILA alineada con Magnolia Ln. (29.06699, -95.41512)

Mejoras de drenaje

- FILA desde el punto 115' al noroeste de Audubon (29.06938, -95.41544) al sur hasta Quail Run Dr.
- Briarcreek St. de Magnolia Ln. a Qual Run Dr.
- Quail Run Dr. desde Oyster Creek Dr. este 1230' (29.06615, -95.41464)
- 4 Oaks St desde Briar Creek St. este 622' (29.06705, -95.41465)
- FILA desde el punto en el lado noroeste de Briarcrest St. (29.06833, -95.41546) sureste 116' (29.06827, -95.4151)
- FILA desde el punto al norte de 4 Oaks St. en el lado noroeste de Briarcreek St. (29.06742, -95.41646) hasta el lado sureste de Briarcrest St. (29.06732, -95.41637).
- FILA desde el punto al sur de 4 Oaks St en el lado noroeste de Briarcreek St. (29.06718, -95.41669) hasta el lado sureste de Briarcreek St. (29.06712, -95.41663).
- FILA desde el punto 14' al noreste de Quail Run en el lado noroeste de Briarcreek St. (29.0665, -95.41745) hasta el lado sureste de Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. desde el punto 40' al noreste de 4 Oaks St. al suroeste 465' hasta el punto 100' al noreste de Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. desde Briarcreek St. este 622' (29.06705, -95.41465)
- Quail Run Dr. desde el punto 260' al este de Briarcreek St.(29.06613, -95.41673) al este 650' (29.06615, -95.41464)
- FILA desde el punto 260' al este de Briarcreek St. en el lado norte de Quail Run Dr. (29.06626, -95.41673) hasta el lado sur de Quail Run Dr. (29.06613, -95.41673).
- FILA al final de Quail Run Dr. y en el lado norte de Quail Run Dr. (29.06625, -95.41519) hasta el lado sur de Quail Run Dr. (29.06617, -95.41519)

Mejoras en las calles

- Quail Run Dr. desde Oyster Creek Drive de este a fin (1,045 pies cuadrados)
- Brian Creek St desde 290' al sur de Audubon Woods Dr. hacia el sur hasta Quail Run Drive 4 Oaks St. desde Briar Creek St. hacia el este hasta el final 475'

Descripción del proyecto propuesto [24 CFR 50.12 y 58.32; 40 CFR 1508.25]:
Las mejoras propuestas mejorarán el drenaje existente al transportarlo a través de un sistema subterráneo de alcantarillado pluvial y desechar las estructuras del alcantarillado pluvial a una zanja de drenaje recientemente mejorada. El proyecto mejorará la condición de la calle reelaborando y estabilizando el material base y realizando una reconstrucción completa de la calle. Una sección de calle uniforme junto con la adición de un sistema subterráneo de alcantarillado pluvial ayudará a transportar las aguas pluviales lejos de las casas adyacentes durante futuros desastres por inundaciones y disminuirá las inundaciones de las calles durante eventos de lluvia intensa. Las mejoras propuestas a las tuberías principales de agua reemplazarán la infraestructura antigua de las tuberías principales de agua.

Llanura de inundación
Según el mapa de llanura aluvial de FEMA n.° 48039C0610K (fecha de entrada en vigor 30/12/20), el proyecto está ubicado en la Zona AE de FEMA (llanura aluvial de 100 años). Según FFSST, según la ubicación definida por el usuario, la vida útil (36 años) y la designación no crítica, la acción propuesta se encuentra en la llanura aluvial del FFRMS.

La cantidad estimada de aumento del nivel del mar para 2050 es de 3 pies, lo que corresponde a una elevación de inundación FFRMS de 15 FT NAVD88. La cantidad estimada de aumento del nivel del mar para 2060 es de 3 pies, lo que corresponde a una elevación de inundación FFRMS de 15 FT NAVD88. El dato vertical de América del Norte de 1988 (NAVD88) es el dato utilizado en los mapas digitales de tasas de seguro contra inundaciones (DFIRM) de FEMA para las elevaciones de inundación base (BFE). Los proyectos ubicados en la llanura aluvial del FFRMS deben diseñarse de manera consistente con las políticas y directivas aplicables de la agencia que toma o aprueba la acción.

El área de perturbación: 3,84 acres.

WOTUS
De acuerdo con el Informe de Delineación de Humedales/Aguas de EE. UU. completado para este proyecto, se concluyó lo siguiente:

No se encuentran humedales dentro del área del proyecto. Dentro del área del proyecto se encuentran un arroyo intermitente potencialmente jurisdiccional (zanja 1, afluente de Bastrop Bayou: 1.849 LF, 0,52 acres) y una zanja de drenaje de aguas pluviales no jurisdiccional (zanja 2: 847 LF, 0,10 acres). Siempre que el emisario de aguas pluviales propuesto para el nuevo sistema de alcantarillado pluvial se instale sobre el OHWM de la Zanja 1 (afluente de Bastrop Bayou) y no haya material de relleno colocado debajo del OHWM del canal, no se requerirá ningún permiso de la Sección 404 para el proyecto. . Si el diseño del proyecto cambia, los impactos en WOTUS deben reevaluarse para determinar si se requiere un permiso de la Sección 404.

Valores naturales de la llanura aluvial:
Los recursos naturales de la llanura aluvial incluyen recursos hídricos, biológicos y sociales. El proyecto propuesto tendrá impactos mínimos en las llanuras aluviales porque se implementará la mitigación adecuada.

El **ciudad de richwood** ha considerado las siguientes alternativas y medidas de mitigación a tomar para minimizar los impactos adversos y restaurar y preservar los valores naturales y beneficiosos:

1. Trabaje únicamente fuera de la llanura aluvial de 100 años. - La infraestructura a abordar se encuentra dentro de llanuras aluviales de 100 años y debe abordarse. (No es viable)
2. Obtenga una Carta de Enmienda de Mapa (LOMA) o una Carta de Revisión de Mapa (LOMR). - Se determinó que ni una LOMA ni una LOMR eran probables ni prácticas para el área del proyecto. (No es viable)
3. Otras infraestructuras consideradas. - Después de considerar otros proyectos potenciales en la Ciudad, se determinó que de los proyectos elegibles, este era el de mayor prioridad. (No es viable)
4. Ninguna acción o acciones alternativas que sirvan el mismo propósito. - La infraestructura a abordar es inadecuada para la zona y debe abordarse para prevenir riesgos para la salud pública. (No es viable)

Medidas de mitigación que se deben tomar para minimizar los impactos adversos y restaurar y preservar los valores naturales y beneficiosos:

- Preservación de la propiedad: Los diseños de los proyectos deben, en la mejor medida posible, incorporar medidas para reducir el riesgo de daños a la nueva infraestructura a través de una inundación.
- Preservar los valores naturales y minimizar los impactos: una vez finalizada la construcción, será necesario revegetar inmediatamente el área perturbada con pastos nativos. En la llanura aluvial y en el lugar sólo se utilizarán plantas autóctonas.
- La deposición y excavación de materiales deberá realizarse de tal manera que se controle la erosión y la sedimentación.
- Será necesario tomar precauciones en el manejo de combustibles u otros materiales peligrosos para evitar descargas o derrames que resulten en una menor calidad del agua subterránea.
- Será necesario implementar y mantener durante la construcción medidas de control de la erosión, como fardos de heno o barreras de pantalla de sedimento, según sea necesario.
- El ingeniero del proyecto deberá incorporar las mejores prácticas de gestión en las especificaciones y planes.

Fecha de cualquier LOMR o LOMA final o condicional de FEMA: Ninguno solicitado.

La ciudad **de Richwood** asegurará que sea aplicable Se siguen los procedimientos estatales y locales de protección de llanuras aluviales.d. La **ciudad de Richwood** tiene reevaluó las alternativas a la construcción en la llanura aluvial y ha determinado que no tiene ninguna alternativa viable. Los archivos ambientales que documentan el cumplimiento de los pasos 3 a 6 de la Orden Ejecutiva 11988 están disponibles para inspección, revisión y copia del público previa solicitud en los horarios y lugares delineados en el último párrafo de este aviso para la recepción de comentarios.

Hay tres propósitos principales para este aviso. En primer lugar, se debe dar a las personas que puedan verse afectadas por las actividades en las llanuras aluviales y a aquellos que tengan interés en la protección del medio ambiente natural la oportunidad de expresar sus

preocupaciones y proporcionar información sobre estas áreas. En segundo lugar, un programa adecuado de avisos públicos puede ser una importante herramienta educativa pública. La difusión de información y la solicitud de comentarios públicos sobre las llanuras aluviales pueden facilitar y mejorar los esfuerzos federales para reducir los riesgos e impactos asociados con la ocupación y modificación de estas áreas especiales. En tercer lugar, como cuestión de justicia, cuando el gobierno federal determine que participará en acciones que se lleven a cabo en la llanura aluvials, debe informar a quienes puedan correr un riesgo mayor o continuo.

Los comentarios escritos deben ser recibidos por la **ciudad de Richwood** A la siguiente dirección en o antes **26 de julio de 2024** un período mínimo de comentarios de 7 días calendario comenzará el día después de la publicación y finalizará el día 8.th día después de la publicación: **Ayuntamiento de la ciudad de Richwood, 1800 Brazosport Blvd N, Richwood, TX 77531 y 972-265-2082.** También se podrá revisar una descripción completa del proyecto de 9:00 am a 5:00 pm desde la dirección mencionada anteriormente**.** Los comentarios también pueden enviarse por correo electrónico a todd@texasenvironmentals.com.

Fecha: 18 de julio de 2024

Office of the City Secretary

Elections

Boards & Commissions

Public Information Request and Open Meetings Information

Human Resources

Public Notices

Open Records Request

Public Notices

Public Works

TCEQ Reporting Violation, Q1 2023

Consumer Confidence Report 2023

Fair Housing

Report Housing Discrimination

Early Notice and Public Review of a Proposed Activity in a Floodplain

Richwood – Flood and Drainage – Notice1

Richwood – Flood and Drainage -Notice1 – Spanish

Richwood Flood Maps


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Early Notice and Public Review of a Proposed Activity in a Floodplain

To: All interested Agencies, Groups and Individuals.

This is to give notice that the **City of Richwood** has determined that the following proposed action under the Community Development Block Grant - Disaster Recovery Program administered by the Texas General Land Office – U.S. Department of Housing and Urban Development's Community Development Block Grant Mitigation (CDBG-MIT) and **Richwood - Flood and Drainage - 24-065-013-E170, #24-065-013-E170 / B-18-DP-48-0002,** is located in a floodplain, and the **City of Richwood** will be identifying and evaluating practicable alternatives to locating the action in the floodplain and the potential impacts on the floodplain from the proposed action, as required by Executive Order 11988, in accordance with HUD regulations at 24 CFR 55.20 Subpart C Procedures for Making Determinations on Protection of Floodplains.

Project Location:
All work will occur in the City of Richwood, Brazoria County, Texas at the following locations:

Water Improvements

- Magnolia Ln. from north side of Audubon Woods Dr. (29.06938, -95.41544) south down ROW to point 30' south of Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. from Oyster Creek Dr. to ROW aligned with Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. from Quail Run Dr. to Magnolia Ln.
- 4 Oaks St. from Briar Creek St. east to ROW aligned with Magnolia Ln. (29.06699, -95.41512)

Drainage Improvements

- ROW from point 115' northwest of Audubon (29.06938, -95.41544) south to Quail Run Dr
- Briarcreek St. from Magnolia Ln . to Qual Run Dr.
- Quail Run Dr. from Oyster Creek Dr. east 1,230' (29.06615, -95.41464)
- 4 Oaks St from Briar Creek St. east 622 ' (29.06705, -95.41465)
- ROW from point on northwest side of Briarcrest St. (29.06833, -95.41546) southeast 116' (29.06827, -95.4151)
- ROW from point north of 4 Oaks St. on the northwest side of Briarcreek St. (29.06742, -95.41646) to southeast side of Briarcrest St. (29.06732, -95.41637).
- ROW from point south of 4 Oaks St on northwest side of Briarcreek St. (29.06718, -95.41669) to southeast side of Briarcreek St. (29.06712, -95.41663).
- ROW from point 14' northeast of Quail Run on northwest side of Briarcreek St. (29.0665, -95.41745) to southeast side of Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. from point 40' northeast of 4 Oaks St. southwest 465' to point 100' northeast of Quail Run Dr. (29.06642, -95.41737)
- 4 Oaks St. from Briarcreek St. east 622' (29.06705, -95.41465)

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- Quail Run Dr. from point 260' east of Briarcreek St.(29.06613, -95.41673) east 650' (29.06615, -95.41464)
- ROW from point 260' east of Briarcreek St. on north side of Quail Run Dr. (29.06626, -95.41673) to southside of Quail Run Dr. (29.06613, -95.41673).
- ROW at end of Quail Run Dr. and on north side of Quail Run Dr. (29.06625, -95.41519) to southside of Quail Run Dr. (29.06617, -95.41519)

Street Improvements

- Quail Run Dr. from Oyster Creek Drive east to end (1,045 lf)
- Brian Creek St from 290' south of Audubon Woods Dr. south to Quail Run Drive4 Oaks St. from Briar Creek St. east to end 475'

Description of the Proposed Project [24 CFR 50.12 & 58.32; 40 CFR 1508.25]**:**
The proposed improvements will improve the existing drainage by conveying it via an underground storm sewer system and outfalling the storm sewer structures to a recently improved drainage ditch. The project will improve the condition of the street by reworking and stabilizing the base material and performing a full street reconstruction. A uniform street section coupled with the addition of an underground storm sewer system will help to convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation during intense rain events. The proposed water main improvements will replace aging water main infrastructure.

FLOODPLAIN
According to FFSST, the project is located in the FFRMS floodplain. According to FEMA floodplain map #48039C0610K (Effective Date 12/30/20), the project is located in FEMA Zone AE (100-year floodplain). The area of disturbance: 3.84 acres.

WOTUS
According to the Wetlands/Waters of the U.S. Delineation Report completed for this project, the following was concluded:

No wetlands are located within the project area. One potentially jurisdictional intermittent stream (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) are located within the project area. Provided the proposed stormwater outfall from the new storm sewer system will be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and there is no fill material placed below the OHWM of the channel, no Section 404 permit will be required for the project. Should the project design change, impacts to WOTUS should be re-evaluated to determine whether a Section 404 permit is required.

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Natural and beneficial values potentially adversely affected by the activity:

1. Preventing loss of life and property as a result of flooding is the highest priority. Another flood could damage the new infrastructure.
2. In addition to concerns for life and property, the City has considered the natural values of the floodplain. The natural resources of the floodplain include water, biological, and societal resources. The proposed project will have minimal impacts to the floodplains because there will be minimal disturbance to the floodplain.
3. After review of the County Lists of Endangered and Threatened Species for the County, on-site inspections of the project site and consultation with the USFWS and TPWD, it was concluded that the construction of the facilities will have no quantifiable impact on plant and animal life. Only native plants are to be used in the floodplain and on the site.
4. Societal resources should also be considered during the design process. The designs are meant to complement the natural features of the area and to offer an aesthetically pleasing structure. The site will not have an effect on agricultural lands.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains and those who have an interest in the protection of the natural environment should be given an opportunity to express their concerns and provide information about these areas. Commenters are encouraged to offer alternative sites outside of the floodplain, alternative methods to serve the same project purpose, and methods to minimize and mitigate impacts. Second, an adequate public notice program can be an important public educational tool. The dissemination of information and request for public comment about floodplains can facilitate and enhance Federal efforts to reduce the risks and impacts associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the Federal government determines it will participate in actions taking place in floodplains, it must inform those who may be put at greater or continued risk.

Written comments must be received by the **City of Richwood** at the following address on or before **July 15, 2024, City of Richwood City Hall, 1800 Brazosport Blvd N., Richwood, TX 77531 and 972-265-2082.** A full description of the project may also be reviewed from **9:00 AM to 5:00 PM.** at the address above**.** Comments may also be submitted via email at **todd@texasenvironmentals.com**.

Posting Date: June 28, 2024

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Aviso temprano y revisión pública de una propuesta
Actividad en una llanura aluvial

Para: Todas las agencias, grupos e individuos interesados.

Esto es para dar aviso de que la ciudad **de Richwood** ha determinado que la siguiente acción propuesta bajo la Subvención en Bloque para el Desarrollo Comunitario - Programa de Recuperación de Desastres administrado por la Oficina General de Tierras de Texas - Departamento de Vivienda de EE. UU. y UrBan Development's Community Development Block Grant Mitigación (CDBG-MIT) y **Richwood - Inundaciones y drenaje - 24-065-013-E170, #24-065-013-E170 / B-18-DP-48-0002,** Se encuentra en una llanura aluvial, y el **ciudad de Richwood** identificará y evaluará alternativas practicables para ubicar la acción en la zona de inundación plano y los impactos potenciales en la llanura aluvial de la acción propuesta, según lo exige Orden Ejecutiva 11988, de acuerdo con las regulaciones de HUD en 24 CFR 55.20 Subparte C Procedimientos para tomar determinaciones sobre la protección de Llanura de inundaciones.

Localización del proyecto:
Todo el trabajo se realizará en la ciudad de Richwood, condado de Brazoria, Texas, en las siguientes ubicaciones:

Mejoras del agua

- Magnolia Ln. desde el lado norte de Audubon Woods Dr. (29.06938, -95.41544) hacia el sur por ROW hasta el punto 30' al sur de Quail Run Dr. (29.06613, -95.41513).
- Quail Run Dr. desde Oyster Creek Dr. hasta ROW alineado con Magnolia Ln. (29.06628, -95.41513)
- Briar Creek St. desde Quail Run Dr. hasta Magnolia Ln.
- 4 Oaks St. desde Briar Creek St. hacia el este hasta la FILA alineada con Magnolia Ln. (29.06699, -95.41512)

Mejoras de drenaje

- FILA desde el punto 115’ al noroeste de Audubon (29.06938, -95.41544) al sur hasta Quail Run Dr.
- Briarcreek St. de Magnolia Ln. a Qual Run Dr.
- Quail Run Dr. desde Oyster Creek Dr. este 1230’ (29.06615, -95.41464)
- 4 Oaks St desde Briar Creek St. este 622’ (29.06705, -95.41465)
- FILA desde el punto en el lado noroeste de Briarcrest St. (29.06833, -95.41546) sureste 116’ (29.06827, -95.4151)
- FILA desde el punto al norte de 4 Oaks St. en el lado noroeste de Briarcreek St. (29.06742, -95.41646) hasta el lado sureste de Briarcrest St. (29.06732, -95.41637).
- FILA desde el punto al sur de 4 Oaks St en el lado noroeste de Briarcreek St. (29.06718, -95.41669) hasta el lado sureste de Briarcreek St. (29.06712, -95.41663).
- FILA desde el punto 14’ al noreste de Quail Run en el lado noroeste de Briarcreek St. (29.0665, -95.41745) hasta el lado sureste de Briarcreek St. (29.06642, -95.41737).
- Briarcreek St. desde el punto 40’ al noreste de 4 Oaks St. al suroeste 465’ hasta el punto 100’ al noreste de Quail Run Dr. (29.06642, -95.41737)


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- 4 Oaks St. desde Briarcreek St. este 622’ (29.06705, -95.41465)
- Quail Run Dr. desde el punto 260’ al este de Briarcreek St.(29.06613, -95.41673) al este 650’ (29.06615, -95.41464)
- FILA desde el punto 260’ al este de Briarcreek St. en el lado norte de Quail Run Dr. (29.06626, -95.41673) hasta el lado sur de Quail Run Dr. (29.06613, -95.41673).
- FILA al final de Quail Run Dr. y en el lado norte de Quail Run Dr. (29.06625, -95.41519) hasta el lado sur de Quail Run Dr. (29.06617, -95.41519)

Mejoras en las calles

- Quail Run Dr. desde Oyster Creek Drive de este a fin (1,045 pies cuadrados)
- Brian Creek St desde 290’ al sur de Audubon Woods Dr. hacia el sur hasta Quail Run Drive 4 Oaks St. desde Briar Creek St. hacia el este hasta el final 475’

Descripción del proyecto propuesto [24 CFR 50.12 y 58.32; 40 CRF 1508.25]**:**
Las mejoras propuestas mejorarán el drenaje existente al transportarlo a través de un sistema subterráneo de alcantarillado pluvial y desechar las estructuras del alcantarillado pluvial a una zanja de drenaje recientemente mejorada. El proyecto mejorará la condición de la calle reelaborado y estabilizando el material base y realizando una reconstrucción completa de la calle. Una sección de calle uniforme junto con la adición de un sistema subterráneo de alcantarillado pluvial ayudará a transportar las aguas pluviales lejos de las casas adyacentes durante futuros desastres por inundaciones y disminuirá las inundaciones de las calles durante eventos de lluvia intensa. Las mejoras propuestas a las tuberías principales de agua reemplazarán la infraestructura antigua de las tuberías principales de agua.

Llanura de inundación
Según FFSST, el proyecto está ubicado en la llanura aluvial de FFRMS. Según el mapa de llanura aluvial de FEMA n.º 48039C0610K (fecha de entrada en vigor 30/12/20), el proyecto está ubicado en la Zona AE de FEMA (llanura aluvial de 100 años). El área de perturbación: 3,84 acres.

WOTUS
De acuerdo con el Informe de Delineación de Humedales/Aguas de EE. UU. completado para este proyecto, se concluyó lo siguiente:

No se encuentran humedales dentro del área del proyecto. Dentro del área del proyecto se encuentran un arroyo intermitente potencialmente jurisdiccional (zanja 1, afluente de Bastrop Bayou: 1.849 LF, 0,52 acres) y una zanja de drenaje de aguas pluviales no jurisdiccional (zanja 2: 847 LF, 0,10 acres). Siempre que el desagüe de aguas pluviales propuesto para el nuevo sistema de alcantarillado pluvial se instale sobre el OHWM de la zanja 1 (afluente de Bastrop Bayou) y no haya material de relleno colocado debajo del OHWM del canal, no se requerirá ningún permiso de la Sección 404 para el proyecto. . Si el diseño del proyecto cambia, los impactos en WOTUS deben reevaluarse para determinar si se requiere un permiso de la Sección 404.

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Valores naturales y beneficiosos potencialmente afectados negativamente por la actividad:

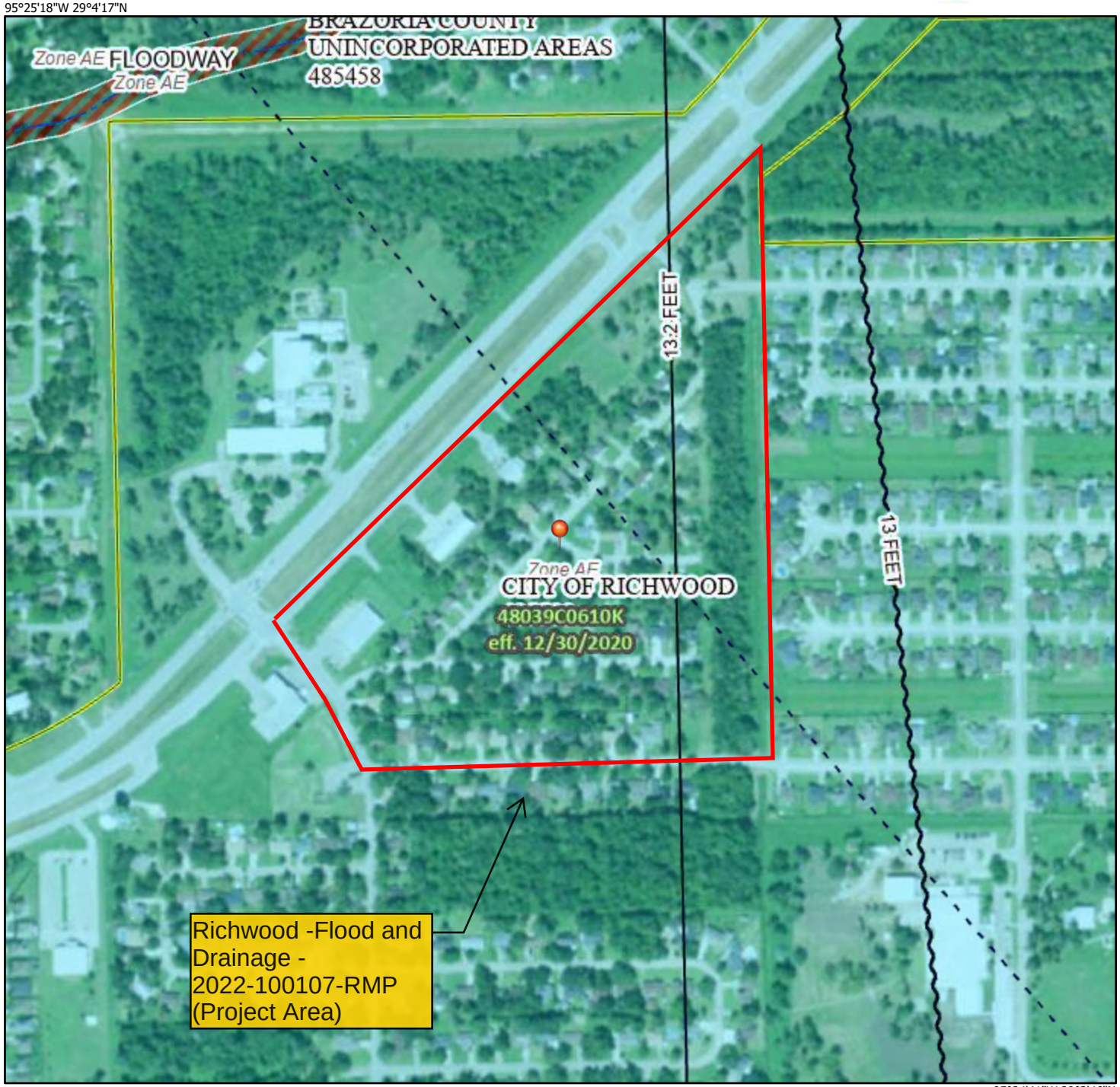
1. Prevenir la pérdida de vidas y bienes como resultado de las inundaciones es la máxima prioridad. Otra inundación podría dañar la nueva infraestructura.
2. Además de las preocupaciones por la vida y la propiedad, la Ciudad ha considerado los valores naturales de la llanura aluvial. Los recursos naturales de la llanura aluvial incluyen recursos hídricos, biológicos y sociales. El proyecto propuesto tendrá los impactos mínimos en las llanuras aluviales porque habrá una perturbación mínima en las llanuras aluviales.
3. Después de la revisión de las Listas de especies amenazadas y en peligro de extinción del condado, las inspecciones in situ del sitio del proyecto y la consulta con el USFWS y el TPWD, se concluyó que la construcción de las instalaciones no tendrá un impacto cuantificable en la vida vegetal y animal. . En la llanura aluvial y en el lugar sólo se utilizarán plantas autóctonas.
4. Los recursos sociales también deben considerarse durante el proceso de diseño. Los diseños están destinados a complementar las características naturales del área y ofrecer una estructura estéticamente agradable. El sitio no afectará las tierras agrícolas.

Hay tres propósitos principales para este aviso. En primer lugar, se debe dar a las personas que puedan verse afectadas por las actividades en las llanuras aluviales y a aquellos que tengan interés en la protección del medio ambiente natural la oportunidad de expresar sus preocupaciones y proporcionar información sobre estas áreas. Se anima a los comentaristas a ofrecer sitios alternativos fuera de la llanura aluvial, métodos alternativos para cumplir el mismo propósito del proyecto y métodos para minimizar y mitigar los impactos. En segundo lugar, un programa adecuado de avisos públicos puede ser una importante herramienta educativa pública. La difusión de información y la solicitud de comentarios públicos sobre llanuras aluviales puede facilitar y mejorar los esfuerzos federales para reducir los riesgos e impactos asociados con la ocupación y modificación de estas áreas especiales. En tercer lugar, como cuestión de justicia, cuando el gobierno federal determina que participará en acciones que se llevan a cabo en llanuras aluviales, debe informar a quienes puedan estar en mayor riesgo o en mayor riesgo.

Los comentarios escritos deben ser recibidos por la **ciudad de Richwood** en la siguiente dirección en o antes **15 de julio de 2024, Ayuntamiento de la ciudad de Richwood, 1800 Brazosport Blvd N., Richwood, TX 77531 y 972-265-2082.** También se puede revisar una descripción completa del proyecto desde **9:00 a. m. a 5:00 p. m.** en la dirección arriba**.** Los comentarios también pueden enviarse por correo electrónico a **todd@texasenvironmentals.com**.

Destino Fecha: 28 de junio de 2024

National Flood Hazard Layer FIRMette



Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/9/2023 at 1:14 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FFRMS CISA Report

Created: 6/14/2024

Summary

Based on the user-defined location, service life (36 Years), and non-critical designation, the proposed action is in the FFRMS floodplain.

The 2050 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88.

The 2060 estimated sea-level rise amount is 3 ft, corresponding to a FFRMS flood elevation of 15 FT NAVD88.

The North American Vertical Datum of 1988 (NAVD88) is the datum used on FEMA Digital Flood Insurance Rate Maps (DFIRMs) for Base Flood Elevations (BFEs).

Projects located in the FFRMS floodplain should be designed consistent with the applicable policies and directives of the agency taking or approving the action.

Proposed Action Details

Location centroid (Latitude, Longitude): 29°4'1.2"N 95°24'58.68"W

Service criticality: Non-critical Service Life: Through 2060

Consult with the applicable agency to identify any agency-specific policies, guidance, protocols, or direction on the critical action determination. The services of a professional engineer, architect, or other licensed design professional are recommended for designing critical actions or assets with long intended service life, and for other situations where risk tolerance is low because of unique characteristics of the action.

Considerations of CISA approach at this location

• N/A

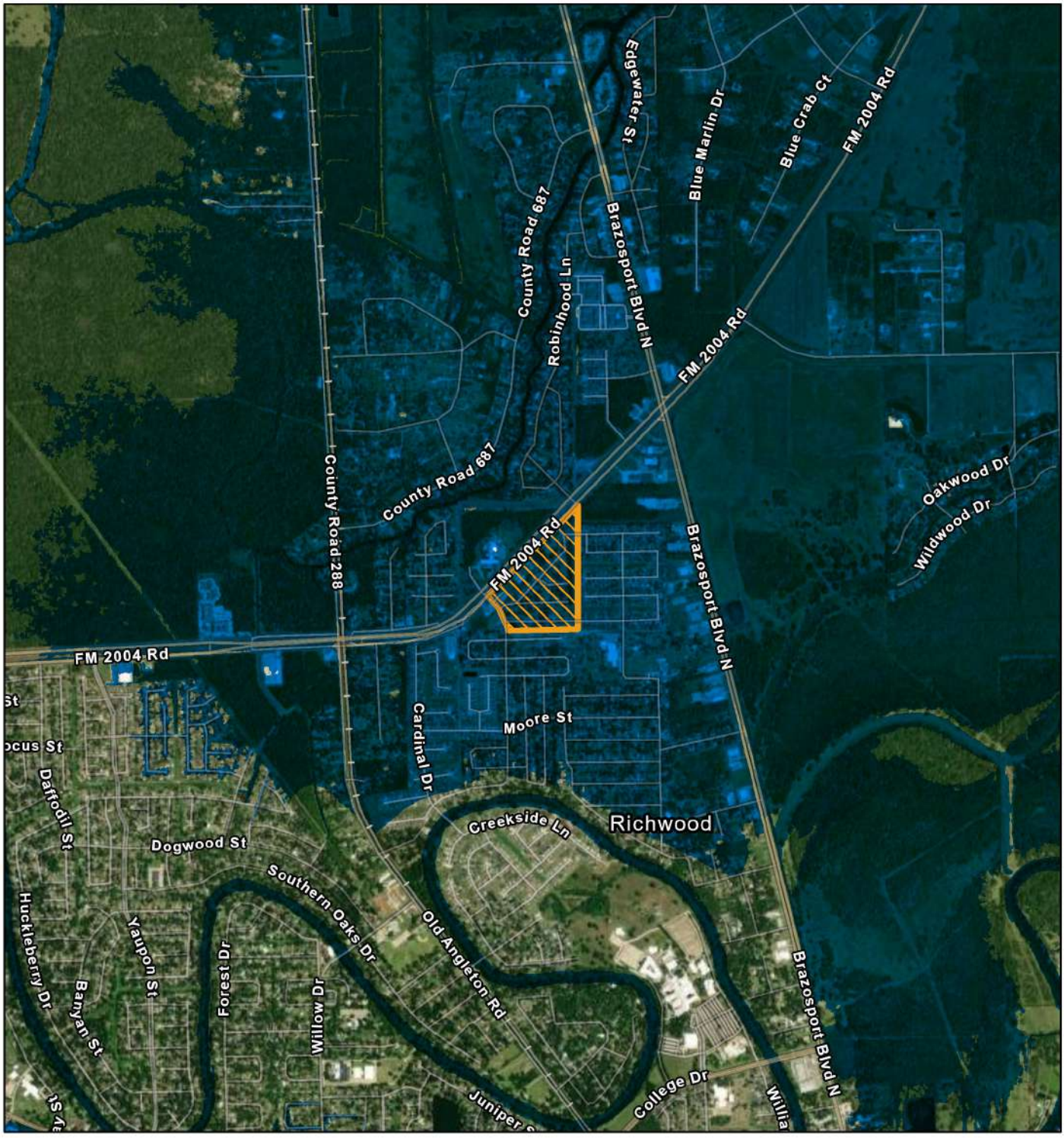
Next Steps

This is the Step 1 of the 8-step decision-making process required in section 2(a) of Executive Order 11988, Floodplain Management (Determine if the proposed action within the FFRMS floodplain). Follow the remainder of the 8-step process outlined in the Implementation Guidelines (2015), page 4, including Step 5 which include minimizing harm and restoring and preserving natural and beneficial values. (Please refer to the Nature Based Solutions section). A licensed design professional should be contacted for the design or engineering of the action. If an action is in the FFRMS floodplain and its location is the only practicable alternative, then you may need the services of a professional engineer, architect, or other licensed design professional to determine how to minimize the impacts of flood and make the action resilient (e.g., elevation, flood-proofing and/or nature-based solutions), especially when dealing with critical actions.

Assistance

To contact the FEMA Regional Floodplain Management & Insurance FFRMS Point of Contact for assistance, e-mail FEMA at FEMA-FFRMS-SUPPORT-REQUEST@fema.dhs.gov

2050 Project Location



June 14, 2024

Project Location

FFRMS Floodplain

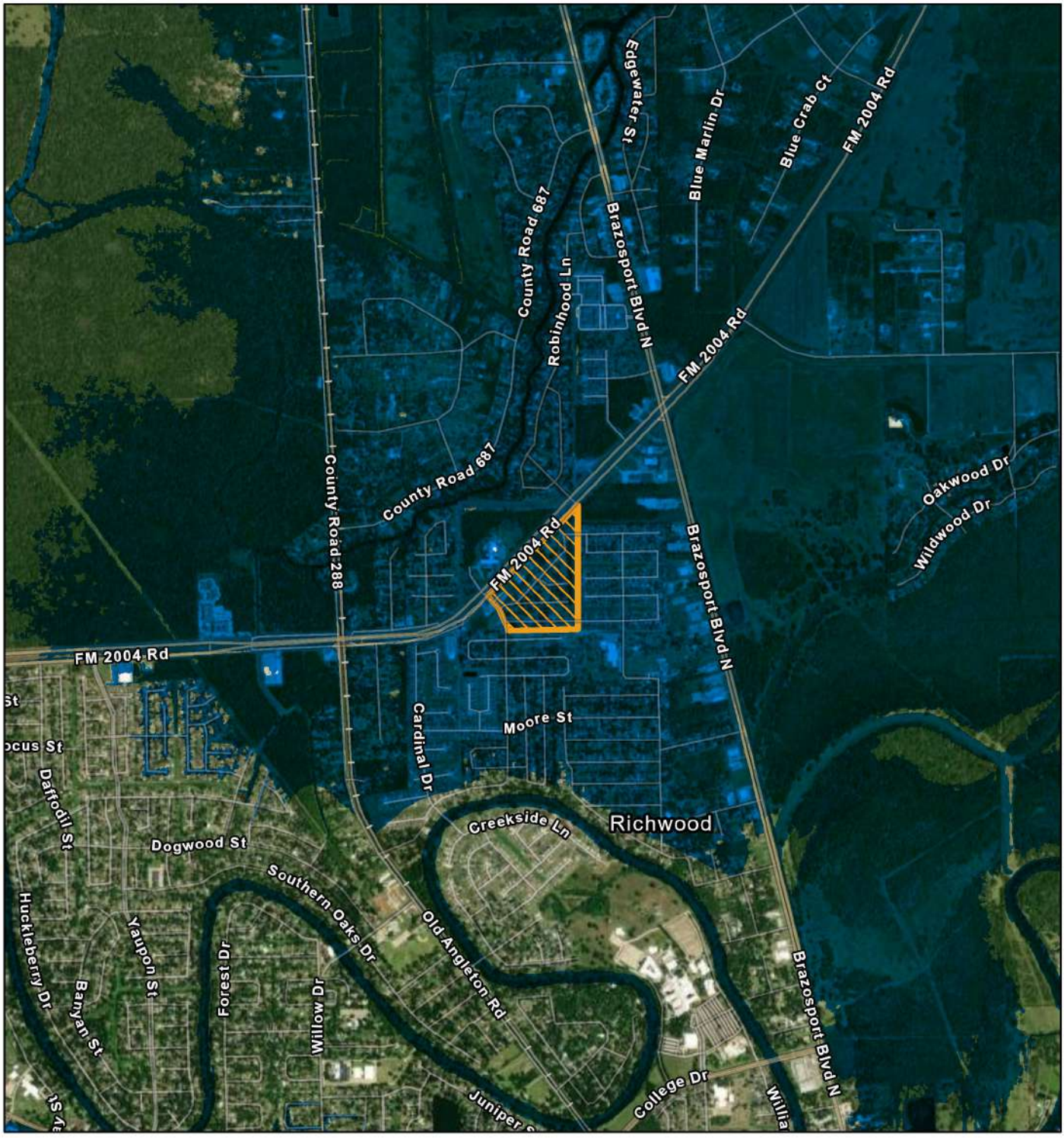
1:31,845

0 0.23 0.45 0.9 mi

0 0.38 0.75 1.5 km

Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, Foursquare, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Earthstar Geographics, null

2060 Project Location



June 14, 2024

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Historical Preservation

Texas Historical Commission

Todd Cave <todd@caveconsulting.com>

Richwood -Flood and Drainage - 2022-100107-RMP

1 message

noreply@thc.state.tx.us <noreply@thc.state.tx.us> Thu, Jan 18, 2024 at 2:42 PM
To: todd@caveconsulting.com, reviews@thc.state.tx.us

TEXAS HISTORICAL COMMISSION
real places telling real stories

Re: Project Review under Section 106 of the National Historic Preservation Act and/or the Antiquities Code of Texas
THC Tracking #202404979
Date: 01/18/2024
Richwood -Flood and Drainage - 2022-100107-RMP
northwest part of city
Other City,TX 77531

Description: Water, Drainage and Street Improvements

Dear Todd Cave:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act and the Antiquities Code of Texas.

The review staff, led by Justin Kockritz and Emily McCuistion , has completed its review and has made the following determinations based on the information submitted for review:

Above-Ground Resources

- No historic properties are present or affected by the project as proposed. However, if historic properties are discovered or unanticipated effects on historic properties are found, work should cease in the immediate area; work can continue where no historic properties are present. Please contact the THC's History Programs Division at 512-463-5853 to consult on further actions that may be necessary to protect historic properties.

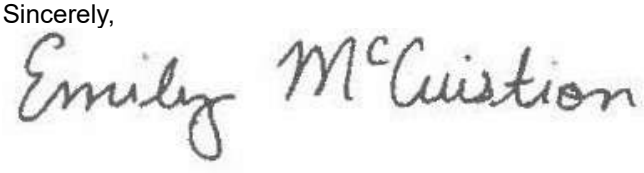
Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: justin.kockritz@thc.texas.gov, Emily.McCuistion@thc.texas.gov .

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,



for Bradford Patterson, Chief Deputy State Historic Preservation Officer
Deputy Executive Director, Texas Historical Commission

Please do not respond to this email.

Todd Cave <todd@caveconsulting.com>

Project Review Submission

1 message

NoResponse@thc.state.tx.us <NoResponse@thc.state.tx.us> Thu, Jan 11, 2024 at 1:05 PM
To: todd@caveconsulting.com

Thank you for submitting project: Richwood -Flood and Drainage - 2022-100107-RMP

Tracking Number: 202404979

Due Date: 1/25/2024 12:05:03 PM (14 days)

TEXAS HISTORICAL COMMISSION

REQUE...PO CONSULTATION:

Section 1...ational Historic Preservation Act and/or the Antiquities Code of Texas

* indicates required field

Project In...

P... Richwood -Flood and Drainage - 2022-

Project Address* northwest part of city

Project City* Other City

Project Zip 77531

Project County* Brazoria

Other Counties

Program* GLO CDBG-DR PA

Review Type* Section 106/Antiquities Code Consultation

Permit #

☐ **Does the project or a project component contain or occur within a waterway or water body, such as the ocean and/or bays, rivers, lakes, bayous, or navigation channels?**

***Brief Project Description:** Please provide a short explanation of the project. (200 characters or less)

Water, Drainage and Street Improvements

*Federal & State Involvement**

☑ **This project involves approval, funding, permit or license from a federal agency.**

Federal Agency* HUD

Federal Program, Funding or Permit Type

Federal Contact Person

Federal Contact Email

Notes

☑ **This project involves state or local public property.**

Type of State or Local Agency* City — Other City

Owner Richwood

State or Local Contact Person

State or Local Contact Email

Notes

☐ **Neither of the above is true; this is for private due diligence only and the response will not suffice for regulatory review.**

Attachments:

AN ATTACHMENT IS REQUIRED! YOU CAN ATTACH MULTIPLE FILES TO THIS ONE FORM!!!

Please attach relevant project documentation. The file size limit is 60MB. Accepted File Types: doc,docx,pdf,png,txt,rtf,jpg,xlsx,zip

Choose Files No file chosen

x Richwood Combined Site Visit photos.pdf
x Richwood -Flood and Drainage - 2022-100107-RMP-detailed description - Google Docs.pdf
x Richwood Flood and Drainage Google My Maps-2.pdf
x _ags_e7baa1da-b0a9-11ee-8a87-00155d02ae21.pdf

Submit

Richwood -Flood and Drainage - 2022-100107-RMP

January 11, 2024

1:9,028

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Interested Tribes

City of Richwood
TEXAS

February 29, 2024

Mr. Bob Komardley
Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, Oklahoma 73005

Re: Richwood -Flood and Drainage - 2022-100107-RMP

Dear Mr. Komardley,

The City of Richwood is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). Under HUD regulation 24 CFR 58.4, the City of Richwood has assumed HUD's environmental review responsibilities for the project, including tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

The City of Richwood will conduct a review of this project to comply with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. We would like to invite you to be a consulting party in this review to help identify historic properties in the project area that may have religious and cultural significance to your tribe, and if such properties exist, to help assess how the project might affect them. If the project might have an adverse effect, we would like to discuss possible ways to avoid, minimize or mitigate potential adverse effects.

The project will not occur in a location in the City that has been designated as eligible for listing in the National Register of Historic Places as defined as a historic district that generally retains the feeling, association and the significant physical characteristics of a late-nineteenth to mid-twentieth-century downtown commercial district.

To meet project timeframes, if you would like to be a consulting party on this project, can you please let us know of your interest within 30 days? If you have any initial concerns with impacts of the project on religious or cultural properties, can you please note them in your response?

A Project Description Aerial Map and THC Atlas have been enclosed for your reference.

More information on the Section 106 review process is available at http://www.onecpd.info/environmental-review/historic-preservation/.
HUD's process for tribal consultation under Section 106 is described in a Notice available at https://www.onecpd.info/resource/2448/notice-cpd-12-006-tribal-consultation-under-24-cfr-part-58.

We kindly request that you send all responses to:

(979) 265 2082
info@richwoodtx.gov
1800 Brazosport Blvd. N.
Richwood, Texas 77531

City of Richwood
TEXAS

Todd Cave, ESP
Cave Consulting, Inc.
PO Box 140715
Dallas, TX 75214
todd@texasenvironmentals.com
(214) 307-4161

If you do not wish to consult on this project, can you please inform us and include in your reply the name and contact information for the tribe's principal representative in the consultation?

We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

Michael Durham, Mayor

City of Richwood
TEXAS

February 29, 2024

Mr. Mark Woommavovah
Chairman
Comanche Nation, Oklahoma
584 Nw Bingo
Road, Lawton, OK - 73507

Re: Richwood -Flood and Drainage - 2022-100107-RMP

Dear Mr. Woommavovah,

The City of Richwood is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). Under HUD regulation 24 CFR 58.4, the City of Richwood has assumed HUD's environmental review responsibilities for the project, including tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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Sincerely,

Michael Durham, Mayor

City of Richwood
TEXAS

February 29, 2024

The Honorable Russell Martin
President
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Road
Tonkawa, Oklahoma 74653

Re: Richwood -Flood and Drainage - 2022-100107-RMP

Dear President Martin,

The City of Richwood is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). Under HUD regulation 24 CFR 58.4, the City of Richwood has assumed HUD's environmental review responsibilities for the project, including tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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Sincerely,

Michael Durham, Mayor

City of Richwood
TEXAS

February 29, 2024

Mr. Jonathan Cernek
Chairman
Coushatta Tribe of Louisiana
1940 C.C. Bel Road
Elton, LA 70532

Re: Richwood -Flood and Drainage - 2022-100107-RMP

Dear Mr. Cernek,

The City of Richwood is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). Under HUD regulation 24 CFR 58.4, the City of Richwood has assumed HUD's environmental review responsibilities for the project, including tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

Michael Durham, Mayor

City of Richwood
TEXAS

February 29, 2024

The Honorable Terri Parton
President
Wichita and Affiliated Tribes
(Wichita, Keechi, Waco & Tawakonie), Oklahoma
P.O. Box 729
Anadarko, Oklahoma 73005

Re: Richwood -Flood and Drainage - 2022-100107-RMP

Dear President Parton,

The City of Richwood is considering funding the project listed above with federal funds from the U.S. Department of Housing and Urban Development (HUD). Under HUD regulation 24 CFR 58.4, the City of Richwood has assumed HUD's environmental review responsibilities for the project, including tribal consultation related to historic properties. Historic properties include archeological sites, burial grounds, sacred landscapes or features, ceremonial areas, traditional cultural places and landscapes, plant and animal communities, and buildings and structures with significant tribal association.

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Dallas, TX 75214
todd@texasenvironmentals.com
(214) 307-4161

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We value your assistance and look forward to consulting further if there are historic properties of religious and cultural significance to your tribe that may be affected by this project.

Sincerely,

Michael Durham, Mayor

7019 1120 0000 6043 7492

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Street and Apt. No., or PO Box No.: P.O. Box 1330

City, State, ZIP+4®: Anadarko, Oklahoma 73005

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- ☐ Adult Signature Restricted Delivery $

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Total Postage and Fees
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Sent To: Terri Parton

Street and Apt. No., or PO Box No.: P.O. Box 729

City, State, ZIP+4®: Anadarko, Oklahoma 73005

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- ☐ Adult Signature Restricted Delivery $

Postage
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Total Postage and Fees
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Sent To: Mark Woommavovah

Street and Apt. No., or PO Box No.: 549 NW Bingo Road

City, State, ZIP+4®: Lawton, Ok 73507

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$

Postmark Here

Sent To: Mr. Jonathan Cormek

Street and Apt. No., or PO Box No.: 1940 C.C. Bel Road

City, State, ZIP+4®: Elton, LA 70532

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postage
$

Total Postage and Fees
$

Postmark Here

Sent To: Russell Martin

Street and Apt. No., or PO Box No.: 1 Rush Buffalo Road

City, State, ZIP+4®: Tonkawa, Oklahoma 74653

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

Tribal Directory Assessment Information

Contact Information for Tribes with Interests in Brazoria County, Texas

	Tribal Name	County Name
−	Apache Tribe of Oklahoma	Brazoria

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Durell Cooper	Chairman	511 East Colorado, Anadarko, OK - 73005	(405) 247-9493	(405) 247-2763	durell.cooper@apachetribe.org	
Bobby Komardley	Chairman	PO Box 1330, Anadarko, OK - 73005	(405) 247-9493	(405) 247-2763	bkomardley@outlook.com	http://www.apachetribe.org/

	Tribal Name	County Name
−	Comanche Nation, Oklahoma	Brazoria

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Martina Minthorn	THPO	6 Sw, Lawton, OK - 73502	580-595-9618	580-595-9733	martina.minthorn@comanchenation.com	www.comanchenation.com
Mark Woommavovah	Chairman	584 Nw Bingo Road, Lawton, OK - 73507	(580) 492-4988	(580) 492-3796	mark.woommavovah@comanchenation.com	www.comanchenation.com

	Tribal Name	County Name
−	Coushatta Tribe of Louisiana	Brazoria

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Kristian Poncho	THPO	P.O. Box 10, Elton, LA - 70532	337-275-1350		kponcho@coushatta.org	http://koasatiheritage.org/
Jonathan Cernek	Chairman	1940 C.C. Bel Road, Elton, LA - 70532	(337) 584-1401	(337) 584-1507	mbell@coushatta.org	http://koasatiheritage.org/

	Tribal Name	County Name
−	Tonkawa Tribe of Indians of Oklahoma	Brazoria

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Russell Martin	President	1 Rush Buffalo Road, Tonkawa, OK - 74653-4449	(580) 628-2561	(580) 628-3375	rmartin@tonkawatribe.com	http://www.tonkawatribe.com/
Lauren Norman-Brown	THPO	1 Rush Buffalo Road, Tonkawa, OK - 74653	(580) 628-7027	(580) 628-7027	lbrown@tonkawatribe.com	http://www.tonkawatribe.com/

−	Wichita and Affiliated Tribes (Wichita, Keechi, Waco & Tawakonie), Oklahoma	Brazoria

Contact Name	Title	Mailing Address	Work Phone	Fax Number	Email Address	URL
Gary McAdams	THPO	Wichita And Affiliated Tribes Po Box 729, Anadarko, OK - 73005	(405) 247-8695 ext. 200	405-247-2430	gary.mcadams@wichitatribe.com	http://www.wichitatribe.com/
Terri Parton	President	1 1/4 Mile North Of Anadarko On Highway 281, Anadarko, OK - 73005	(405) 247-2425	(405) 247-2430	terri.parton@wichitatribe.com	http://www.wichitatribe.com/

1 - 5 of 5 results

« ‹ 1 › » 10

Noise Abatement and Control

Noise (EA Level Reviews)

General requirements	Legislation	Regulation
HUD's noise regulations protect residential properties from excessive noise exposure. HUD encourages mitigation as appropriate.	Noise Control Act of 1972 General Services Administration Federal Management Circular 75-2: "Compatible Land Uses at Federal Airfields"	Title 24 CFR 51 Subpart B
References		
https://www.hudexchange.info/programs/environmental-review/noise-abatement-and-control		

1. **What activities does your project involve? Check all that apply:**

☐ New construction for residential use
NOTE: HUD assistance to new construction projects is generally prohibited if they are located in an Unacceptable zone, and HUD discourages assistance for new construction projects in Normally Unacceptable zones. See 24 CFR 51.101(a)(3) for further details.
→ *Continue to Question 2.*

☐ Rehabilitation of an existing residential property
NOTE: For major or substantial rehabilitation in Normally Unacceptable zones, HUD encourages mitigation to reduce levels to acceptable compliance standards. For major rehabilitation in Unacceptable zones, HUD strongly encourages mitigation to reduce levels to acceptable compliance standards. See 24 CFR 51 Subpart B for further details.
→ *Continue to Question 2.*

☐ A research demonstration project which does not result in new construction or reconstruction, interstate, land sales registration, or any timely emergency assistance under disaster assistance provisions or appropriations which are provided to save lives, protect property, protect public health and safety, remove debris and wreckage, or assistance that has the effect of restoring facilities substantially as they existed prior to the disaster
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

X None of the above
→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

2. **Complete the Preliminary Screening to identify potential noise generators in the vicinity (1000' from a major road, 3000' from a railroad, or 15 miles from an airport). Indicate the findings of the Preliminary Screening below:**

☐ There are no noise generators found within the threshold distances above.

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide a map showing the location of the project relative to any noise generators.*

☐ Noise generators were found within the threshold distances.

→ *Continue to Question 3.*

3. **Complete the Noise Assessment Guidelines to quantify the noise exposure. Indicate the findings of the Noise Assessment below:**

☐ Acceptable: (65 decibels or less; the ceiling may be shifted to 70 decibels in circumstances described in §24 CFR 51.105(a))

Indicate noise level here: ☐

→ *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below. Provide noise analysis, including noise level and data used to complete the analysis.*

☐ Normally Unacceptable: (Above 65 decibels but not exceeding 75 decibels; the floor may be shifted to 70 decibels in circumstances described in 24 CFR 51.105(a))

Indicate noise level here: ☐

<u>If project is rehabilitation:</u>

→ *Continue to Question 4. Provide noise analysis, including noise level and data used to complete the analysis.*

<u>If project is new construction:</u>

Is the project in a largely undeveloped area[1]?

☐ No

→ *Continue to Question 4. Provide noise analysis, including noise level and data used to complete the analysis, and any other relevant information.*

[1] A largely undeveloped area means the area within 2 miles of the project site is less than 50 percent developed with urban uses and does not have water and sewer capacity to serve the project.

☐ Yes

→*Your project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i). Elevate this review to an EIS-level review.*

☐ Unacceptable: (Above 75 decibels)

Indicate noise level here: [ ]

If project is rehabilitation:

HUD strongly encourages conversion of noise-exposed sites to land uses compatible with high noise levels. Consider converting this property to a non-residential use compatible with high noise levels.

→ *Continue to Question 4. Provide noise analysis, including noise level and data used to complete the analysis, and any other relevant information.*

If project is new construction:

Your project requires completion of an Environmental Impact Statement (EIS) pursuant to 51.104(b)(1)(i). You may either complete an EIS or provide a waiver signed by the appropriate authority. Indicate your choice:

☐ Convert to an EIS

→ *Provide noise analysis, including noise level and data used to complete the analysis.*

Continue to Question 4.

☐ Provide waiver

→ *Provide an Environmental Impact Statement waiver from the Certifying Officer or the Assistant Secretary for Community Planning and Development per 24 CFR 51.104(b)(2) and noise analysis, including noise level and data used to complete the analysis.*

Continue to Question 4.

4. **HUD strongly encourages mitigation be used to eliminate adverse noise impacts. Explain in detail the exact measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation. This information will be automatically included in the Mitigation summary for the environmental review.**

☐ Mitigation as follows will be implemented:

→ *Provide drawings, specifications, and other materials as needed to describe the project's noise mitigation measures. Continue to the Worksheet Summary.*

☐ No mitigation is necessary.

Explain why mitigation will not be made here:

→ *Continue to the Worksheet Summary.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

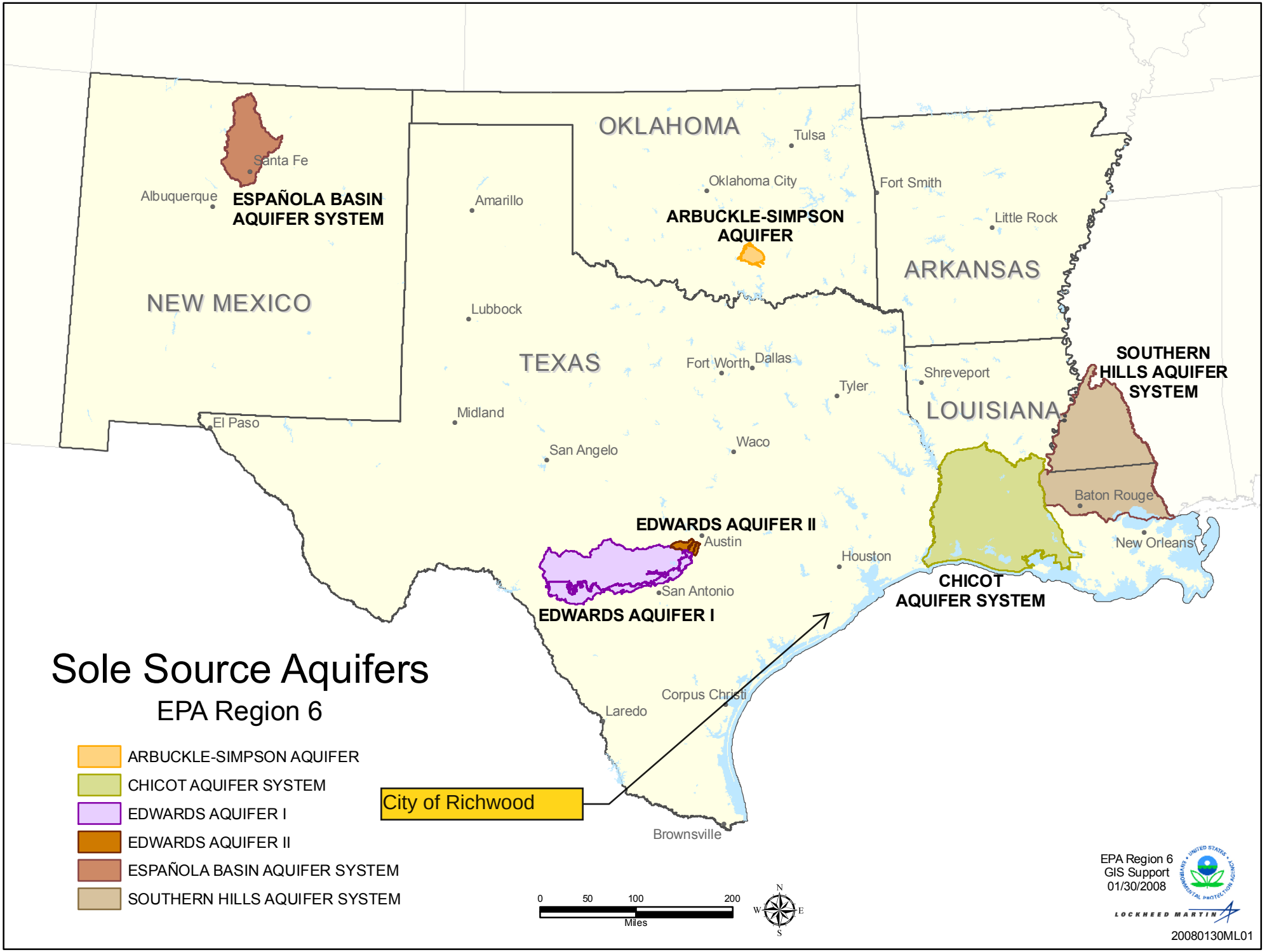
The project does not involve a noise sensitive use such as a residential structure, school, hospital, nursing home, library, etc

Are formal compliance steps or mitigation required?

☐ Yes

X No

Sole Source Aquifers


OKLAHOMA
Tulsa
Oklahoma City
Fort Smith
Little Rock
ARKANSAS
Santa Fe
Albuquerque
ESPAÑOLA BASIN
AQUIFER SYSTEM
Amarillo
ARBUCKLE-SIMPSON
AQUIFER
NEW MEXICO
Lubbock
TEXAS
Fort Worth
Dallas
Shreveport
Tyler
SOUTHERN
HILLS AQUIFER
SYSTEM
LOUISIANA
Midland
El Paso
San Angelo
Waco
Baton Rouge
EDWARDS AQUIFER II
Austin
New Orleans
Houston
CHICOT
AQUIFER SYSTEM
San Antonio
EDWARDS AQUIFER I
Corpus Christi
Laredo
Brownsville
Sole Source Aquifers
EPA Region 6
ARBUCKLE-SIMPSON AQUIFER
CHICOT AQUIFER SYSTEM
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Wetlands Protection

WETLAND/WATERS OF THE U.S. DELINEATION REPORT

CITY OF RICHWOOD
FLOOD & DRAINAGE IMPROVEMENTS PROJECT

CDBG-MIT #2022-100107-RMP

RICHWOOD, BRAZORIA COUNTY, TEXAS 77571

JUNE 25, 2024

Prepared For:

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Richwood, TX 77531

and

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CEC Project No. 024466

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LIST OF ACRONYMS

AJD	Approved Jurisdictional Determination
AMSL	Above Mean Sea Level
APT	Antecedent Precipitation Tool
CEC	Cypress Environmental Consulting LLC
CWA	Clean Water Act
DR	Dominance Ratio
EDR	Environmental Database Report
EPA	Environmental Protection Agency
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GPS	Global Positioning System
HUC	Hydrological Code
IP	Individual Permit
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Permit
OBL	Obligate
OHWM	Ordinary High Water Mark
PI	Prevalence Index
RGP	Regional General Permit
RPW	Relatively Permanent Water
TNW	Traditional Navigable Water
TPWD	Texas Parks and Wildlife Department
UPL	Upland
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Services
USGS	United States Geological Survey
WOTUS	Waters of the United States

EXECUTIVE SUMMARY

The purpose of this wetland delineation report was to identify and delineate all wetlands and waterbodies, including waters of the United States, for the City of Richwood's proposed Flood and Drainage Improvements Project (2022-100107-RMP) located in Richwood, Brazoria County, Texas 77571.

No wetlands are located within the project area. One potentially jurisdictional intermittent stream (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) are located within the project area.

Ditch 1 is an intermittent stream (tributary to Bastrop Bayou) located along the eastern boundary of the project area. Ditch 1 is considered a non-navigable, relatively permanent water that originates approximately 920 feet south of the project area from a stormwater outfall from the adjoining subdivisions and flows 0.40-mile north to its outfall to Bastrop Bayou, a Traditional Navigable Water. Since Ditch 1 exhibits a relatively permanent flow of water and has a direct and continuous surface water connection to a downstream Traditional Navigable Water, Ditch 1 would likely be considered a jurisdictional tributary to Bastrop Bayou and regulated under Section 404 of the Clean Water Act.

Ditch 2 is a man-made stormwater drainage ditch that extends in a north to south alignment and is wholly contained within the subdivision, west of Ditch 1. Ditch 2 originates from a stormwater outfall pipe south of the intersection of Audubon Woods Drive and Briarcreek Street and terminates within a dry bottom retention basin near the southern end of the project area. Since Ditch 2 is a man-made stormwater drainage ditch and has no direct and continuous surface water connection to a downstream Traditional Navigable Water, it is likely Ditch 2 would not be considered a water of the United States and would not be regulated under Section 404 of the Clean Water Act.

Provided the proposed stormwater outfall from the new storm sewer system will be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and there is no fill material placed below the OHWM of the channel, no Section 404 permit will be required for the project. Should the project design change, impacts to waters of the United States should be re-evaluated to determine whether a Section 404 permit is required.

Conclusions regarding the presence and jurisdictional assessment of wetlands and waters and their boundaries contained in this report are the opinion of the professionals conducting the study and are subject to confirmation by the U.S. Army Corps of Engineers Galveston District.

1.0 INTRODUCTION AND PURPOSE

This wetland delineation report evaluates the locations and boundaries of all wetlands and waterbodies, including potential waters of the United States (WOTUS), for the City of Richwood's proposed Flood and Drainage Improvements Project (2022-100107-RMP) located in Richwood, Brazoria County, Texas 77571 (**Appendix A, Figure 1**).

The proposed project activities include drainage, water main, and street improvements at various locations within a residential subdivision in the City of Richwood. The project will improve the existing drainage by conveying it through an underground storm sewer system and outfall to an existing concrete-lined drainage ditch along the eastern boundary of the subdivision. The proposed outfall is designed to tie-in to the existing drainage ditch above the ordinary high water mark of the ditch.

In addition, the project activities include replacing the aging water main infrastructure and performing a full street reconstruction via reworking and stabilizing the base material. A uniform street section coupled with an underground sewer system will help convey stormwater away from adjacent homes during future flooding disasters and lessen street inundation from intense rain events. Ultimately, construction activities include 8,500 square yards (SY) of 6-inch reinforced concrete pavement with concrete curbs and gutters, 9,200 SY of reworking base course material (8-inch minimum thickness), 395 tons of lime stabilization of base material (8-inch minimum thickness), 1,320 SY of storm sewer structures, 4,100 linear feet (LF) of water main, 48 water service lines, six fire hydrants, and traffic control.

The purpose of this report is to identify, delineate, and describe potentially jurisdictional waters, including wetlands, located within the review area in order to assist in the avoidance of impacts and determine whether U.S. Army Corps of Engineers (USACE) permit authorization would be required for the project.

Project Information

Site:	City of Richwood Flood & Drainage Improvements Project
County, State:	Brazoria County, Texas
USGS 7.5-minute Quads:	*Lake Jackson, Texas*
Watershed:	Lower Oyster Creek (HUC 120402050400)

1.1 REGULATORY FRAMEWORK

The USACE regulates the discharge of dredged and fill material into wetlands and other WOTUS under Section 404, subsection 330.5(a)(21) of the Clean Water Act (CWA). Section 10 of the Rivers and Harbors Act of 1899 authorizes the USACE to regulate any work in or affecting navigable WOTUS. Authorization is required from the USACE for any activity that would result in the discharge of dredged or fill material into wetlands and other WOTUS. Regulated activities may be permitted through the USACE via Individual Permits (IP), Regional General Permits (RGP), Nationwide Permits (NWP), or Letters of Permission.

The term "waters of the United States" has broad meaning and incorporates both deepwater aquatic habitats and special aquatic sites, including wetlands. The CWA does not define "waters of the United States"; rather, it provides discretion for EPA and the USACE to define "waters of the United States" in regulations. In the mid-1980s, both agencies promulgated a definition of "waters of the United States".

According to Chapter 33 of the Code of Federal Regulations (CFR) 328.3(a) published November 13, 1986, waters of the U.S. are defined as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation, or destruction of which could affect interstate or foreign commerce including any such waters:
    a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
    b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
    c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the U.S. under the definition;
5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
6. The territorial seas;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.

On May 25, 2023, the Supreme Court issued its ruling on the *Sackett v. Environmental Protection Agency* case. On August 29, 2023, the U.S. Environmental Protection Agency (EPA) and Department of the Army (the agencies) issued a final rule to amend the final "revised Definition of 'Waters of the United States'" rule, published in the Federal Register on January 18, 2023. This final rule conforms the definition of "waters of the United States" to the U.S. Supreme Court's May 25, 2023, decision in the case of *Sackett v. Environmental Protection Agency*. Parts of the January 2023 Rule are invalid under the Supreme Court's interpretation of the CWA in the *Sackett* decision. Therefore, the agencies amended key aspects of the regulatory text to conform it to the Court's decision (EPA 2024a).

The conforming rule, "Revised Definition of 'Waters of the United States;' Conforming," published in the Federal Register and became effective on September 8, 2023. Where the January 2023 Rule is not enjoined, the agencies are implementing the January 2023 Rule, as amended by the conforming rule. As a result of ongoing litigation on the January 2023 Rule, the agencies are implementing the definition of "waters of the United States" under the January 2023 Rule, as amended by the conforming rule, in 23 states, the District of Columbia, and the U.S. Territories. In the other 27 states and for certain parties, the agencies are interpreting "waters of the United States" as consistent with the pre-2015 regulatory regime and the *Sackett* decision until further notice (EPA 2024a).

Under the pre-2015 regulatory regime, tributaries include natural, man-altered, or manmade water bodies that carry flow directly or indirectly into a traditional navigable water. The agencies have interpreted tributaries under the pre-2015 regulatory regime to include ponds with both an inlet and outlet connected to the tributary network, as well as ponds with an outlet connected to the tributary network, if such ponds contribute flow directly or indirectly through one or more waters or features that lie along the flowpath to a traditional navigable water, the territorial seas, or an interstate water. Waters through which a tributary may flow indirectly include, for example, impoundments, wetlands, lakes, ponds, and streams. A tributary may flow through one or more jurisdictional or non-jurisdictional

downstream waters or features, including a non-jurisdictional tributary or non-jurisdictional features, such as a non-jurisdictional ditch or an excluded waste treatment system, and jurisdictional waters that are not tributaries, such as an adjacent wetland. However, the agencies do not interpret tributaries under the pre-2015 regulatory regime to include ponds that are connected to the tributary network by erosional features that lack indicators of an ordinary high water mark such as a nonwetland swale (EPA 2024a).

1.2 WETLANDS

The EPA and the USACE use the *1987 Corps of Engineers Wetlands Delineation Manual* and Regional Supplements to define wetlands for the CWA Section 404 permit program. Section 404 requires a permit from the USACE or authorized state for the discharge of dredged or fill material into the WTOUS, including wetlands.

The *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) defined wetlands based on three criteria: hydrophytic vegetation, hydric soils, and wetland hydrology. In general, all three criteria must be present for an area to qualify as a wetland. Some exceptions can occur in disturbed areas or in newly formed wetlands, where one indicator (such as hydric soils) might be lacking. These areas would be dealt with on an individual basis as outlined in the *Field Guide for Wetland Delineation* (WTI 1991) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0* (USACE 2010).

To determine whether vegetation is predominantly hydrophytic or non-hydrophytic, plant species have traditionally been assessed using wetland indicator status ratings on the National Wetland Plant List (USACE 2022) and a mathematical method for determining if vegetation is hydrophytic, either the Dominance Ratio (DR) or the Prevalence Index (PI). On the 2022 List, plant species are rated in five categories that range from Obligate (OBL) to Upland (UPL) (**Table 1**). The five categories originally represented the frequency with which plant species were thought to occur in wetlands, based on the literature and field experiences of botanists and wetland ecologists. Plant species that are not listed on the 2022 List are considered UPL.

Table 1: Indicator Values Associated with the Wetland Indicator Status Ratings Used on the National Wetland Plant List.

Species Designation	Indicator Status (abbreviation)	Indicator Value	% Occurrence in Wetlands	Ecological Description
Hydrophyte	Obligate (OBL)	1	99	Almost always occur in wetlands
Hydrophyte	Facultative Wetland (FACW)	2	67-99	Usually occur in wetlands, but may occur in non-wetlands
Hydrophyte	Facultative (FAC)	3	34-66	Occur in wetlands and non-wetlands
Nonhydrophyte	Facultative Upland (FACU)	4	1-33	Usually occur in non-wetlands, but may occur in wetlands
Nonhydrophyte	Upland (UPL)	5	1	Almost never occur in wetlands

Source: Lichvar et al. (2016).

1.3 OTHER WATERS

For linear WOTUS, the Ordinary High Water Mark (OHWM) is determined by assessing a combination of factors at each site. In accordance with Sec. 328.3(e) of the Clean Water Act, Regulatory Guidance Letter 05-05 (USACE December 5, 2005), the following factors are considered in determining the jurisdictional boundary of linear waterbodies.

- Clear, natural line on the bank;
- Shelving;
- Changes in soil;
- Destruction of terrestrial vegetation;
- Presence of litter and debris, and/or
- Other appropriate means that consider the characteristics of the surrounding areas.

For tidal WOTUS, the Mean High Tide (MHT) line demarcates the extent of a navigable waterbody. Tidal waterbodies are considered WOTUS and work constructed over, through, or under these waterbodies is regulated under Section 10 of the Rivers and Harbors Act. MHT is defined as the average height of all high waters at a tide station referenced to a 19-year period. In accordance with *Standards and Procedures for Referencing Project Elevation Grades to Nationwide Vertical Datums* USACE Engineer Manual, the MHT is determined by onsite ground verification of local tidal gauge data provided by the National Oceanographic and Atmospheric Administration's, Tides and Currents vertical elevation datum (NOAA 2024a).

2.0 METHODS

2.1 DATA REVIEW

Qualified wetland ecologists reviewed a number of published data resources prior to the field investigations in order to identify potentially jurisdictional wetlands and WOTUS within the review area. Sources consulted included:

- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) map,
- National Hydrography Dataset (NHD),
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey for Brazoria County
- U.S. Geological Survey (USGS) 7.5-minute quadrangle sheets (*Lake Jackson, Texas*)
- Federal Emergency Management Agency (FEMA) flood insurance rate map (FIRM) panel 48039C0610K (eff. 12/30/2020),
- Light Detection and Ranging (LiDAR) data,
- Digital Elevation Model (DEM) data, and
- Recent and historical aerial imagery and topographic maps.

2.2 FIELD DELINEATION

Qualified wetland ecologists conducted a field investigation within the review area on June 6, 2024. The routine method of wetland delineation outlined in the *Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual* (WTI 1991) and updated in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0* (USACE 2010) was utilized for wetland determinations within the site. Field activities focused on wetlands and WOTUS delineation and description.

2.3 DATA COLLECTION

Following the completion of preliminary data gathering and synthesis, the routine method of wetland determination was used to identify potentially jurisdictional areas within the review area. Potential WOTUS including wetlands were evaluated in the field and localized hydrologic characteristics and the dominant vegetative species observed at the site were described.

Data collected for any waterbodies includes average water depth, average width per waterbody, length of linear segments within the project boundary, and water flow classification (i.e., tidal, non-tidal, ephemeral, intermittent, and/or perennial).

Photographs of the general review area and the evaluated features are presented in **Appendix B**.

The Wetland Determination Data Forms completed for the sample points assessed within the review area are presented in **Appendix C**.

Wetland and other WOTUS boundaries were recorded using a handheld Trimble Geo7X Global Positioning System (GPS) unit and confirmed using aerial photography. GPS data was post-processed using Trimble Pathfinder Office software to achieve sub-meter accuracy. The GPS data position information collected during the delineation effort is presented in table format in **Appendix D**.

3.0 RESULTS

3.1 GENERAL DESCRIPTION OF THE SITE

3.1.1 Landscape and Topography

The overall project includes drainage improvements, water main improvements, and street improvements at various locations within a subdivision in Richwood, Brazoria County, Texas 77571 (**Appendix A, Figure 1**). The proposed project activities include improvements to the existing drainage by conveying it through an underground storm sewer system and an outfall to a recently improved drainage ditch east of the review area. The drainage improvements will occur at the following locations:

- Right-of-way (ROW) on the northwest side of Briarcreek Street;
- ROW on the west side of Magnolia Lane;
- ROW on the south side of 4 Oaks Street;
- ROW on the north side of Quail Run Drive; and
- On the eastern side of the review area, from south of Quail Run Drive north at the Briarcreek Street and Magnolia Lane intersection.

The project activities also include performing a full street reconstruction by reworking and stabilizing the base material at Quail Run Drive, Briarcreek Street, and 4 Oaks Street as well as performing water main improvements at Magnolia Lane, Quail Run Drive, Briarcreek Street, and 4 Oaks Drive.

The review area is centered at the coordinates of 29.066990°, -95.416281° and is located on the *Lake Jackson, TX* USGS topographic quadrangle sheet (USGS 1995; **Appendix A, Figure 2**). Elevations within the subdivision are relatively flat and range between 12 feet above mean sea level (AMSL) and 10 feet AMSL. One unnamed intermittent feature, a stormwater drainage ditch, runs parallel to the eastern boundary of the review area. This feature originates approximately 920 feet south of the review area and flows north to its outfall at Bastrop Bayou approximately 0.40-mile northwest of the review area. This ditch is concrete-lined within the review area and is maintained by the Brazoria County Velasco Drainage District (Brazoria County 2024). The banks of the channel slope gently inward toward the center of the channel and range from 8 feet AMSL to 10 feet AMSL and the elevations within the channel are approximately 6 feet AMSL.

The review area is located within an urbanized area of Richwood located east of the intersection of Farm-to-Market (FM) 2004 Road and Oyster Creek Drive. The majority of the review area includes residential and commercial developments with associated maintained lawns. In addition, there is a narrow strip of upland woodland near the eastern side of the review area, on the west side of the drainage ditch. The review area is bounded by FM 2004 Road to the northwest, Oyster Creek Drive to the west, and residential development to the east and south. Land use surrounding the review area consists of residential and commercial development (**Appendix A, Figure 3**).

3.1.2 Geological Setting

According to the Bureau of Economic Geology, the review area is situated within the Alluvium geologic rock unit (USGS 2024a). This rock unit includes floodplain deposits, as well as low terrace deposits three to eight feet above floodplains subject to flooding, and consists of clay, silt, sand, gravel, and organic matter. These deposits are typically formed as a result of flooding or transportation in a stream or river and range from a few feet to more than 30 feet thick commonly underlain by stratified calcareous sands and gravels.

3.1.3 Soils

Information regarding soils within the review area was obtained from the USDA NRCS Web Soil Survey for Brazoria County (NRCS 2024). One mapped soil type, Pledger clay, 0 to 1 percent slopes, rarely flooded (36), occurs within the review area (**Appendix A, Figure 4**). This soil type is associated with floodplains and is listed in the *Hydric Soils of the United States List* as a hydric soil in Brazoria County (NRCS 2015).

3.1.4 Hydrology

The review area is located within the Lower Oyster Creek watershed (HUC 120402050400; USGS 2024b). The NWI map dataset identifies one aquatic feature within the review area and describes it as an excavated intermittent riverine feature (R4SBCx). This feature is the unnamed stormwater drainage ditch that runs parallel to the eastern boundary of the review area (USFWS 2024; **Appendix A, Figure 5**). The ditch originates approximately 920 feet south of the review area and flows north to its outfall at Bastrop Bayou, a Traditional Navigable Water (TNW), approximately 0.40-mile northwest of the review area.

A review of the FEMA FIRM panel 48039C0610K (eff. 12/30/2020) indicates the entirety of the review area is located within Zone AE, the 100-year floodplain of Bastrop Bayou (FEMA 2024; **Appendix A, Figure 6**).

3.1.5 LIDAR

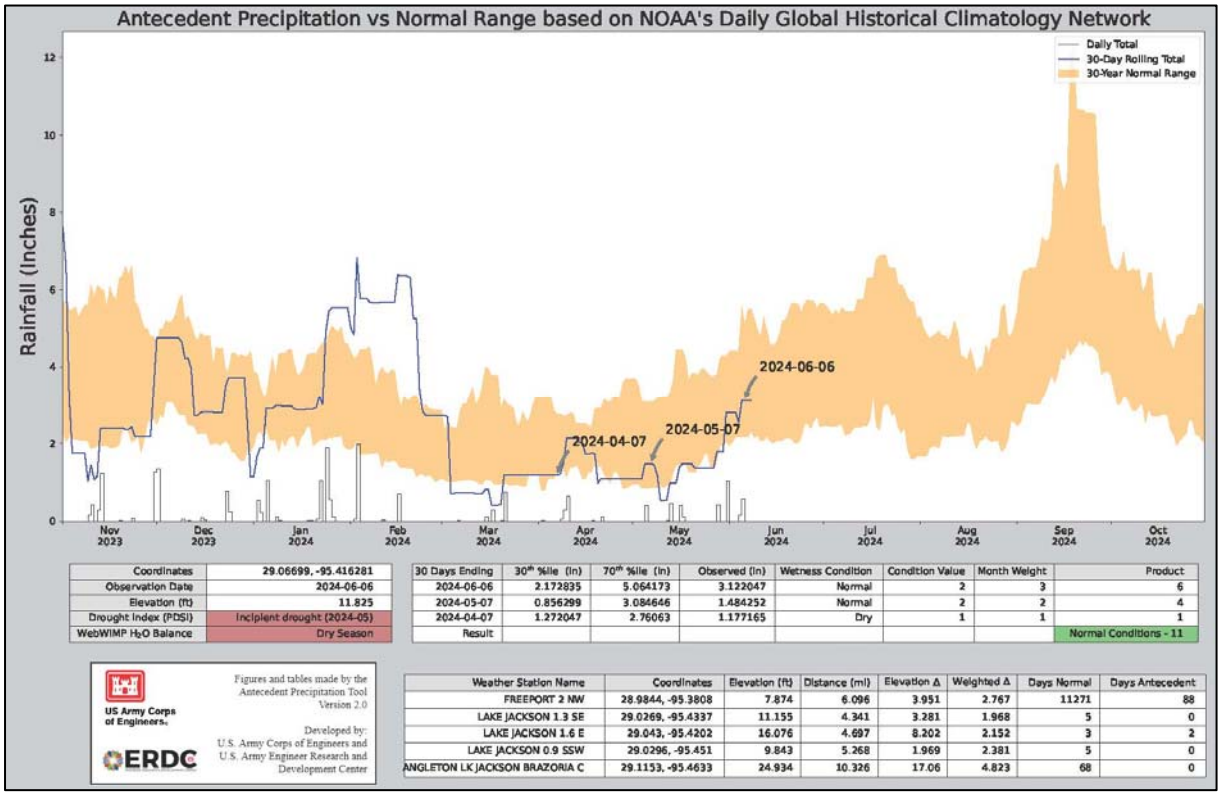
Light detection and ranging (LiDAR) is a remote sensing technique that measures spatial and temporal data. LiDAR information is provided by the Texas Geographic Information Office (TxGIO) online database for each USGS Quadrangle. In addition, the National Oceanic and Atmospheric Administration (NOAA) provides digital elevation models (DEM) of the United States coastline. LiDAR data and DEM imagery were obtained for the *Lake Jackson, Texas* USGS Quad to evaluate elevation changes throughout the project area. A review of the data depicts similar topography as shown in the topographic map with relatively flat topography and elevations ranging between 8 feet AMSL and 12 feet AMSL within the project area. The residential and commercial properties are generally situated at 12 feet and the lowest elevations can be found within the intermittent ditch along the eastern side of the review area (TxGIO 2024; NOAA 2024b; **Appendix A, Figure 7**). **Appendix A** also includes a series of Digital Elevation Model (DEM) and 6-inch Contour LiDAR maps for the review area.

3.1.6 Climate Conditions

The Antecedent Precipitation Tool (APT) is an automation tool that the USACE developed to facilitate the comparison of antecedent or recent rainfall conditions for a given location to the range of normal rainfall conditions that occurred during the preceding 30 years. Using daily rainfall data, the APT calculates 30-day rolling totals for each of the three 30-day periods preceding the observation date. For each period, a weighted condition value is assigned by determining whether the 30-day total falls within, above, or below the 30th to 70th percentiles of precipitation totals from the same date range over the preceding 30 years. The weighted condition values are then summed across the three 30-day periods to calculate a final precipitation normalcy index score. An index score of 9 or lower indicates antecedent precipitation conditions are drier than normal; a score of 10-14 indicates conditions are normal; and a score of 15 or higher indicates conditions are wetter than normal (EPA 2024b).

The APT was used to conduct a typical year analysis for the date of the delineation fieldwork. A single-point method using the latitude and longitude coordinates for the site was utilized to adequately represent the data sources available via the APT for an appropriate analysis of onsite climatic conditions. The analysis demonstrated the site conditions during the field investigation, representing a time of year referenced as the dry season, was experiencing normal climatic conditions (**Figure 1**).

Figure 1. USACE APT Results for June 6, 2024.



3.1.7 Regional Vegetation

The review area is located within the Floodplains and Low Terraces sub-region of the Western Gulf Coastal Plain Ecoregion. This ecoregion covers primarily the Holocene floodplain and low terrace deposits and has a different and less diverse bottomland forest than those of the floodplains of the South Central Plains. Bottomland forests of pecan (Carya illinoensis), water oak (Quercus nigra), southern live oak (Quercus virginiana), and elm (Ulmus sp.), are typical, with some bald cypress (Taxodium distichum) on larger streams. On some terraces, black hickory (Carya texana), post oak (Quercus stellata), and winged elm (Ulmus alata) are found. The Brazos and Colorado River floodplains are broad alluvial sediments, while the floodplains to the south are narrower. The soils are variable and include Vertisols, Mollisols, and Entisols. Large portions of the floodplain forests have been removed and land cover is now a mixture of forest, cropland, and pasture (Griffith et al. 2007).

Based on the Texas Parks and Wildlife Department (TPWD) Texas Ecosystem Analytical Mapper, seven ecological systems are mapped within the review area (TPWD 2024). These vegetation types are listed in **Table 2**. Most of the review area is mapped as Urban Low Intensity (63.91%).

Table 2: TEAM Mapped Vegetation Types within the Review Area			
ID	Mapped Vegetation Type	Acreage in Review Area	% Cover of Review Area
9411	Urban Low Intensity	26.35	63.91
4704	Columbia Bottomlands: Hardwood Forest and Woodland	6.43	15.60
4707	Columbia Bottomlands: Grassland	5.40	13.10
4705	Columbia Bottomlands: Evergreen Shrubland	2.22	5.37
4702	Columbia Bottomlands: Live Oak Forest and Woodland	0.59	1.44
9000	Barren	0.22	0.53
9410	Urban High Intensity	0.02	0.05

Source: TPWD 2024.

Based on observations made during the field investigation, the review area includes maintained grassland with a vegetation community consistent with the Urban Low Intensity (9411) vegetation type. In addition, a narrow strip of mixed hardwood forest is present along the eastern side of the review area that includes a vegetation community most consistent with the Columbia Bottomlands: Hardwood Forest and Woodland (4704) vegetation type.

Vegetation within the maintained grasslands is dominated by Bermuda grass (*Cynodon dactylon*), bahiagrass (*Paspalum notatum*), straggler daisy (*Calyptocarpus vialis*), and St. Augustine grass (*Stenotaphrum secundatum*).

The canopy and midstory of the woodland was dominated by water oak (*Quercus nigra*), live oak (*Quercus virginiana*), yaupon (*Ilex vomitoria*), red mulberry (*Morus rubra*), trumpet creeper (*Campsis radicans*), roundleaf greenbrier (*Smilax rotundifolia*), and eastern poison ivy (*Toxicodendron radicans*). Where present, the herbaceous layer was dominated by wax mallow (*Malvaviscus arboreus*).

Photographs of the review area are presented in **Appendix B**.

3.1.8 Historical Data Review

A review of historical topographic maps (1943, 1959, 1963, 1966, 1974, 1975, 1977, 2013, 2016, 2019, 2022) and historical aerial imagery (1947, 1958, 1961, 1962, 1983, 1995, 2004, 2005, 2006, 2008, 2009, 2010, 2011, 2012, 2014, 2015, 2016, 2017, 2018, 2020, 2022) was conducted to evaluate land use and potential aquatic features within the review area (Historic Aerials 2024; Google Earth 2024; USGS 2024c). The publicly available historical aerial photographs reviewed from Google Earth are presented in **Appendix E** and the publicly available historical topographic maps collected from USGS TopoView are provided in **Appendix F**.

The earliest available topographic map (1943) and aerial images (1930, 1947) depict the review area as undeveloped shrubland. The topographic map depicts one named stream, Bastrop Bayou, approximately 0.5-mile to the northwest of the review area. The present-day Brazosport Boulevard North roadway is first visible 0.4-mile east of the review area in the 1958 aerial and the 1959 topographic map, while the review area remained undeveloped. Between 1958 and 1962, vegetative clearing is visible to make way for various roadways and residential subdivisions in the area. Between

1962 and 1966, a drainage ditch along the eastern boundary of the review area is first visible, connecting to several other stormwater drainage ditches constructed in the area that drain to Bastrop Bayou. By 1966, FM 2004 is depicted in topographic maps in its modern-day alignment along the northern boundary of the review area. Construction of the subdivision within the review area begins in 1977 and continues through 2004. Also visible in 2004 is the subdivision to the south and to the east of the review area. By 2008, several commercial properties are visible along FM 2004. Then in 2010, FM 2004 was expanded to a divided highway which allowed for the continued increase in development surrounding the review area. The review area remains relatively unchanged from 2010 to the present day.

3.2 DESCRIPTION OF AQUATIC FEATURES

Nine sample locations, SP01 through SP09, were evaluated for the potential presence of wetlands within the review area. The sample point locations are depicted in **Appendix A**, **Figure 8,** and the Wetland Determination Data Forms completed for these sample points are presented in **Appendix C**.

No wetlands are located within the review area. One intermittent ditch and one man-made stormwater drainage ditch were identified within the review area. A detailed description of the aquatic features is included below, summarized in **Tables 3 and 4**, and depicted in **Appendix A**, **Figure 9**.

3.2.1 Aquatic Features

Ditch 1 (Intermittent Ditch, Tributary to Bastrop Bayou)
Ditch 1 is an unnamed, intermittent drainage ditch with a concrete-lined channel bottom that flows north to south along the eastern boundary of the review area. Ditch 1 is depicted on the USGS topographic map as an intermittent channel and as an excavated intermittent riverine feature (R4SBCx) on the NWI map (**Appendix A, Figures 2 and 5**). Ditch 1 originates approximately 920 feet south of the review area and flows north to an outfall to Bastrop Bayou, a TNW, approximately 0.40-mile north of the review area. While this ditch is man-made and was constructed wholly in uplands for drainage improvements associated with adjacent residential development between 1962 and 1966, the channel exhibits relatively permanent flow of water and has a direct surface water connection to a downstream TNW (Bastrop Bayou).

The portion of Ditch 1 within the review area is 1,849 linear feet (0.52-acre). The soil underlying Ditch 1 within the review area is mapped as "Pledger clay, 0 to 1 percent slopes, rarely flooded (36)," which is a hydric soil in Brazoria County. The vegetation community adjacent to the channel was maintained grassland dominated by bermudagrass, bahiagrass, and straggler daisy. See **Appendix A, Figures 8 and 9** and **Appendix B, Photos 7-15.**

Ditch 2 (Stormwater Drainage Ditch)
Ditch 2 is a man-made stormwater drainage ditch that is located entirely within the review area and does not have a hydrological connection to any other aquatic feature or potential WOTUS. Ditch 2 originates from a stormwater outfall pipe south of the intersection of Audubon Woods Drive and Briarcreek Street and terminates within a dry bottom retention basin at the south end of the review area. Ditch 2 is not depicted on the USGS topographic map or the NWI map (**Appendix A, Figures 2 and 5**).

Ditch 2 is 847 LF in length and 0.10-acre in size. The soil underlying Ditch 2 is mapped as "Pledger clay, 0 to 1 percent slopes, rarely flooded (36)," which is a hydric soil in Brazoria County. The vegetation community adjacent to the channel included upland woodlands dominated by water oak, live oak,

yaupon, red mulberry, peppervine, saw greenbrier, wax mallow, and eastern poison ivy. See **Appendix A, Figures 8 and 9** and **Appendix B, Photos 16-19.**

3.2.1 Jurisdictional Evaluation

All delineated aquatic features within the review area were identified in the field using the methodology detailed in Regulatory Guidance Letter 05-05, 2010 Atlantic and Gulf Coastal Plain Regional Supplement, and 1987 USACE Wetland Delineation Manual.

One potentially jurisdictional intermittent ditch (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one potentially non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) were identified within the review area. No wetlands are located within the review area.

While Ditch 1 is man-made and was constructed wholly in uplands for drainage improvements associated with adjacent residential development between 1962 and 1966, the channel exhibits a relatively permanent flow of water and has a direct surface water connection to a downstream TNW (Bastrop Bayou) approximately 0.4-mile north of the review area. Therefore, it is CEC's opinion that Ditch 1 would be considered a jurisdictional tributary to Bastrop Bayou as a non-navigable, relatively permanent water (RPW) and would be regulated under Section 404 of the CWA.

Ditch 2 is a stormwater drainage ditch that originates from a stormwater outfall pipe south of the intersection of Audubon Woods Drive and Briarcreek Street and terminates within a dry bottom retention basin at the south end of the review area. Since Ditch 2 is a man-made stormwater drainage ditch that has no direct and continuous surface water connection to a downstream TNW, it is CEC's opinion that Ditch 2 would not be regulated by Section 404 of the CWA.

Table 3: Summary of WOTUS Within the Review Area

Feature	Name of Water Body	Type of Aquatic Resource	Lat/Long (WGS84)	Length (ft)/ Size (acre)	Potential Jurisdictional Status
1	Ditch 1 (Tributary to Bastrop Bayou)	Intermittent ditch	(29.067742°, -95.414647°)	1,849 LF / 0.52-ac	§404
Total WOTUS				**1,849 LF / 0.52 ac**	-

*The jurisdictional status of all features described within the report is the professional judgment of CEC and has not been evaluated by the USACE or EPA.

Table 4: Summary of Non-Regulated Aquatic Features Within the Review Area

Feature	Name of Water Body	Type of Aquatic Resource	Lat/Long (WGS84)	Length (ft)/ Size (acre)	Potential Jurisdictional Status
2	Ditch 2	Stormwater drainage ditch	(29.067213°, -95.415035°)	847 LF / 0.10-ac	Non-JD
Total Non-Regulated Features				**847 LF / 0.10 ac**	-

4.0 CONCLUSIONS

The purpose of this wetland delineation report was to identify and delineate all wetlands and waterbodies, including WOTUS, for the City of Richwood's proposed Flood and Drainage Improvements Project (CDBG-MIT #2022-100107-RMP) located in Richwood, Brazoria County, Texas 77571.

The proposed project activities include drainage improvements to install and replace the storm sewer system and water main lines at various locations within a residential subdivision in the City of Richwood. The project will improve the existing drainage by conveying it through an underground storm sewer system and outfall to an existing concrete-lined drainage ditch along the eastern boundary of the subdivision. The proposed outfall is designed to tie-in to the existing drainage ditch above the OHWM of the ditch.

No wetlands are located within the project area. One potentially jurisdictional intermittent stream (Ditch 1 – tributary to Bastrop Bayou: 1,849 LF, 0.52-acre) and one non-jurisdictional stormwater drainage ditch (Ditch 2: 847 LF, 0.10-acre) are located within the project area.

Ditch 1 is an intermittent stream (tributary to Bastrop Bayou) located along the eastern boundary of the review area. Ditch 1 is considered a non-navigable RPW that originates approximately 920 feet south of the review area from stormwater outfall from the adjoining subdivisions and flows 0.40-mile north to its outfall to Bastrop Bayou, a TNW. Since Ditch 1 exhibits a relatively permanent flow of water and has a direct and continuous surface water connection to a downstream TNW, it is CEC's opinion that Ditch 1 would likely be considered a jurisdictional tributary to Bastrop Bayou and regulated under Section 404 of the CWA.

Ditch 2 is a man-made stormwater drainage ditch that extends in a north to south alignment and is wholly contained within the subdivision, west of Ditch 1. Ditch 2 originates from a stormwater outfall pipe south of the intersection of Audubon Woods Drive and Briarcreek Street and terminates within a dry bottom retention basin near the southern end of the review area. Since Ditch 2 is a man-made stormwater drainage ditch and has no direct and continuous surface water connection to a downstream TNW, it is CEC's opinion that Ditch 2 would not be considered a WOTUS and would not be regulated under Section 404 of the CWA.

Provided the proposed stormwater outfall from the new storm sewer system will be installed above the OHWM of Ditch 1 (tributary to Bastrop Bayou) and there is no fill material placed below the OHWM of the channel, no Section 404 permit will be required for the project. Should the project design change, impacts to WOTUS should be re-evaluated to determine whether a Section 404 permit is required.

Conclusions regarding the presence and jurisdictional assessment of wetlands and waters and their boundaries contained in this report are the opinion of the professionals conducting the study and are subject to confirmation by the USACE Galveston District.

This report was prepared by:

Melissa Fontenot, PWS #2202 — June 25, 2024
Date

Jacqueline Prescott, PWS #3113 — June 25, 2024
Date

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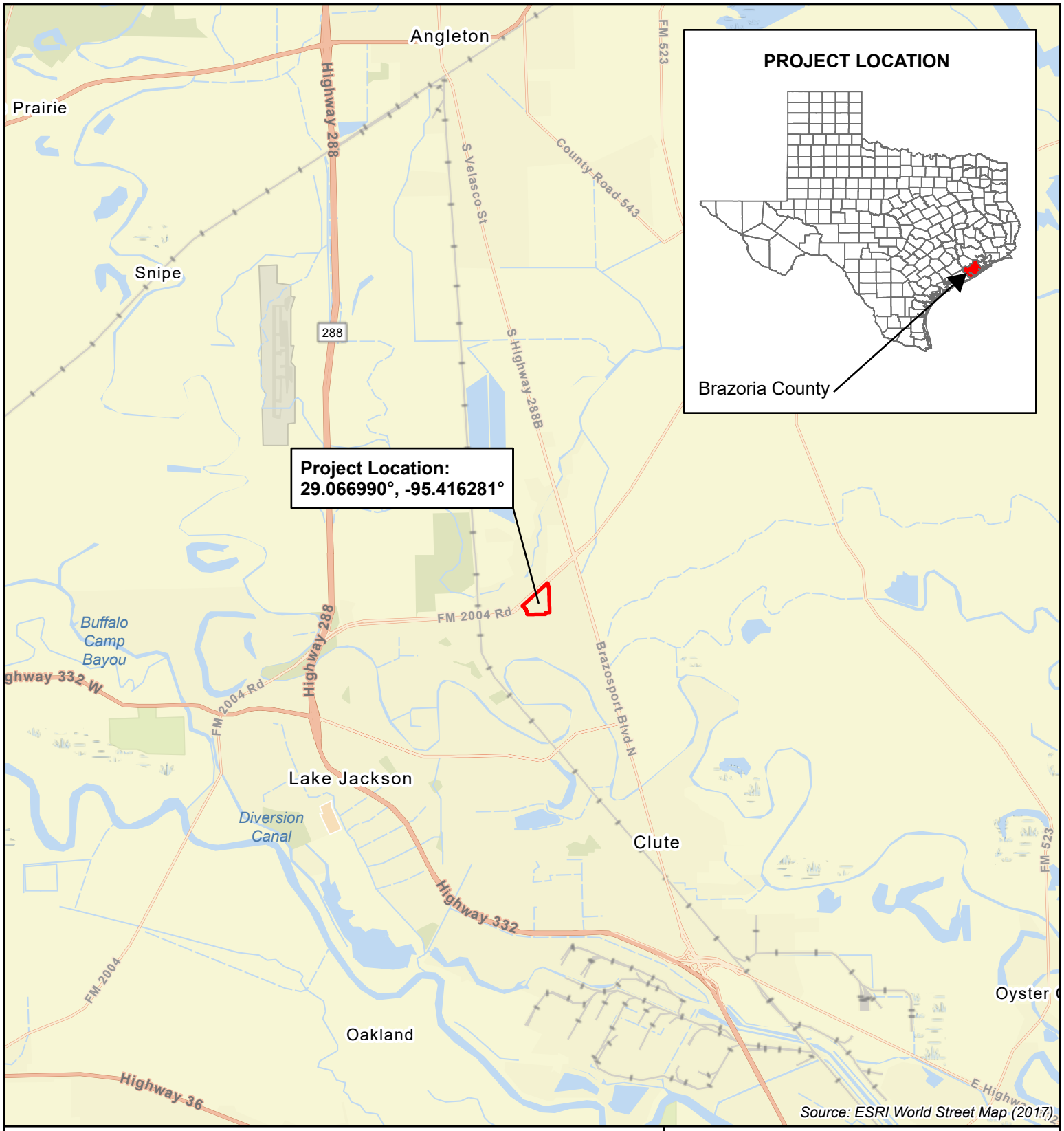
Appendix A

Figures



Legend

Review Area

N

0 1 2 4 Miles

1 inch = 2 mile(s)

FIGURE 1
VICINITY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024

Legend

Review Area

N

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

FIGURE 2
TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024

Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- National Hydrography Dataset (NHD) Feature

0 150 300 600 900 Feet

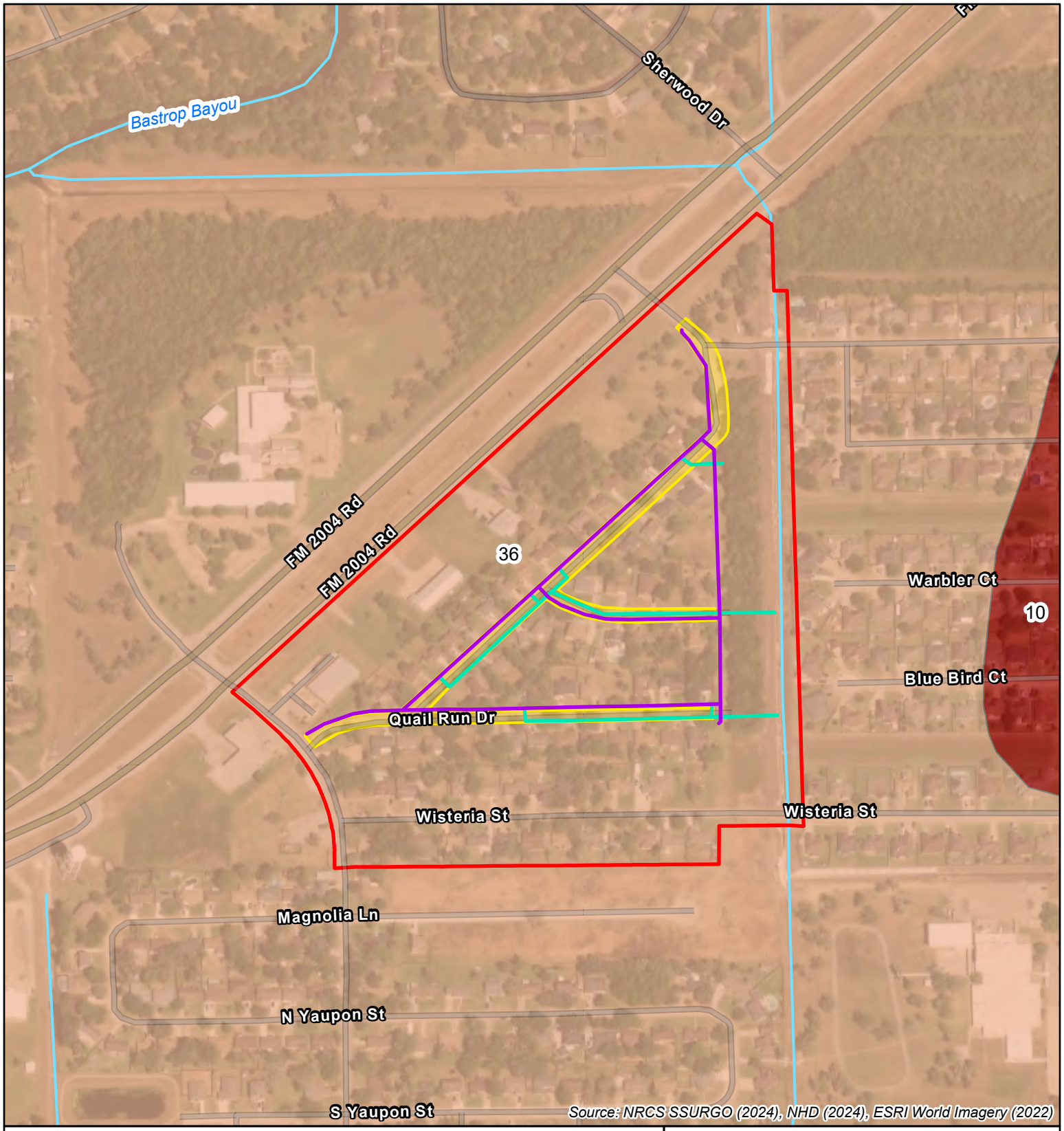
1 inch = 300 feet

N

FIGURE 3
AERIAL PHOTOGRAPH MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- NHD Feature

NRCS Soil Type

- 10 - Brazoria clay, 0-1% slopes, rarely flooded
- 36 - Pledger clay, 0-1% slopes, rarely flooded

0 200 400 800 1,200 Feet

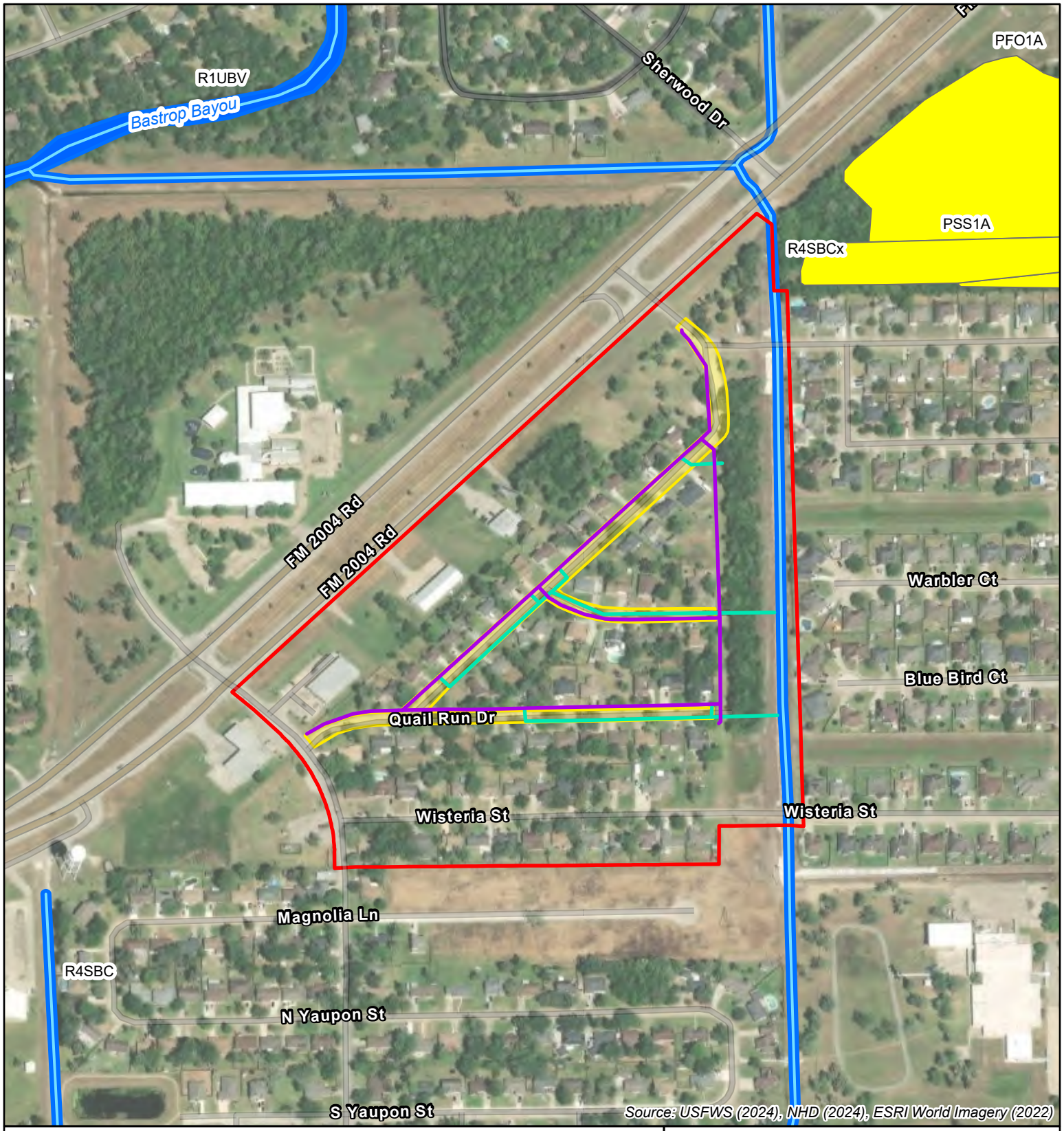
1 inch = 400 feet

N

FIGURE 4
NRCS SOILS MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- NHD Feature

NWI Feature Type

- Freshwater Forested/Shrub Wetland
- Riverine

0 200 400 800 1,200 Feet

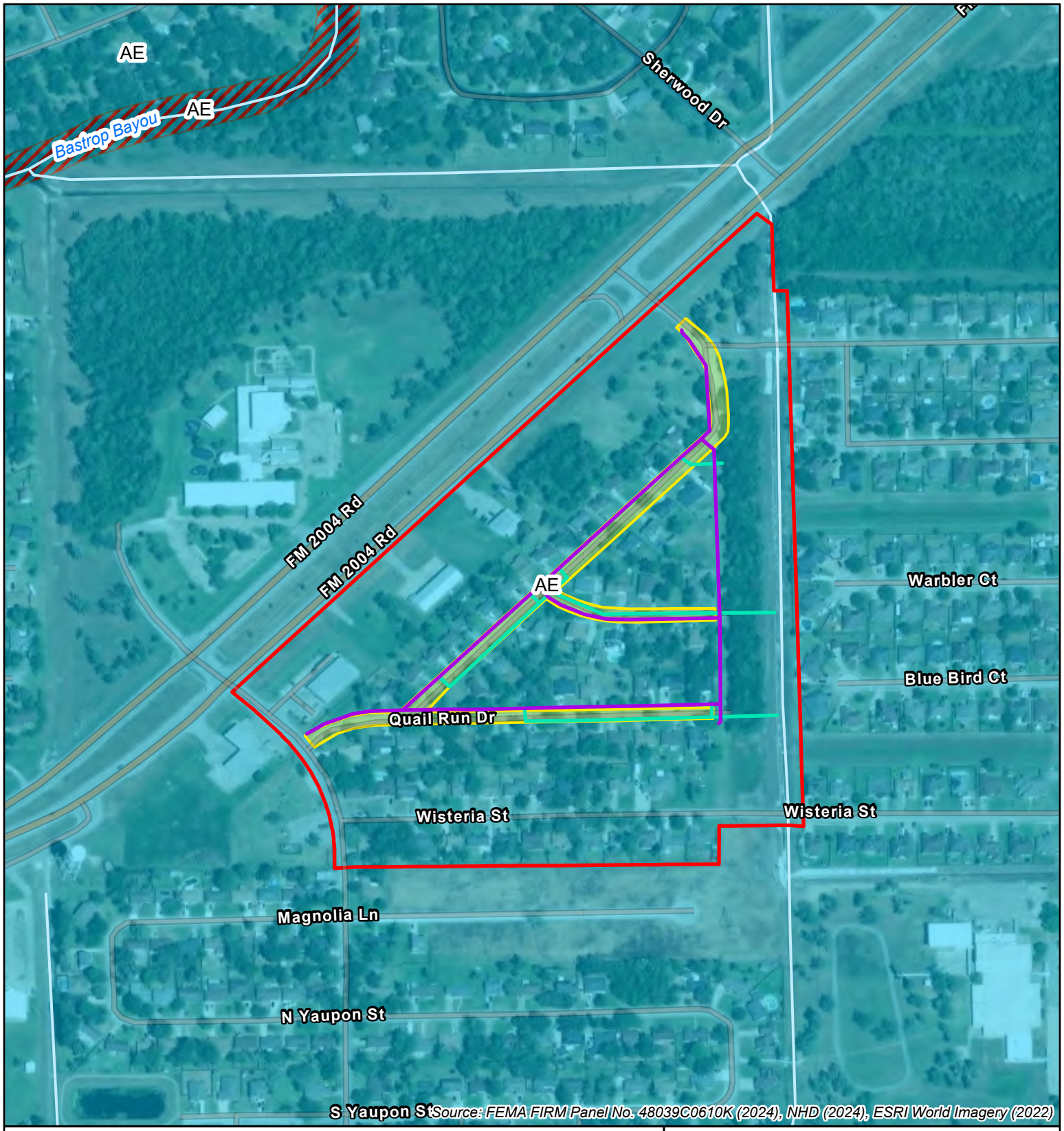
1 inch = 400 feet

N

FIGURE 5
NATIONAL WETLAND INVENTORY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- NHD Feature

FEMA Flood Zone

- AE (Floodway)
- AE (100-Year Floodplain)

N

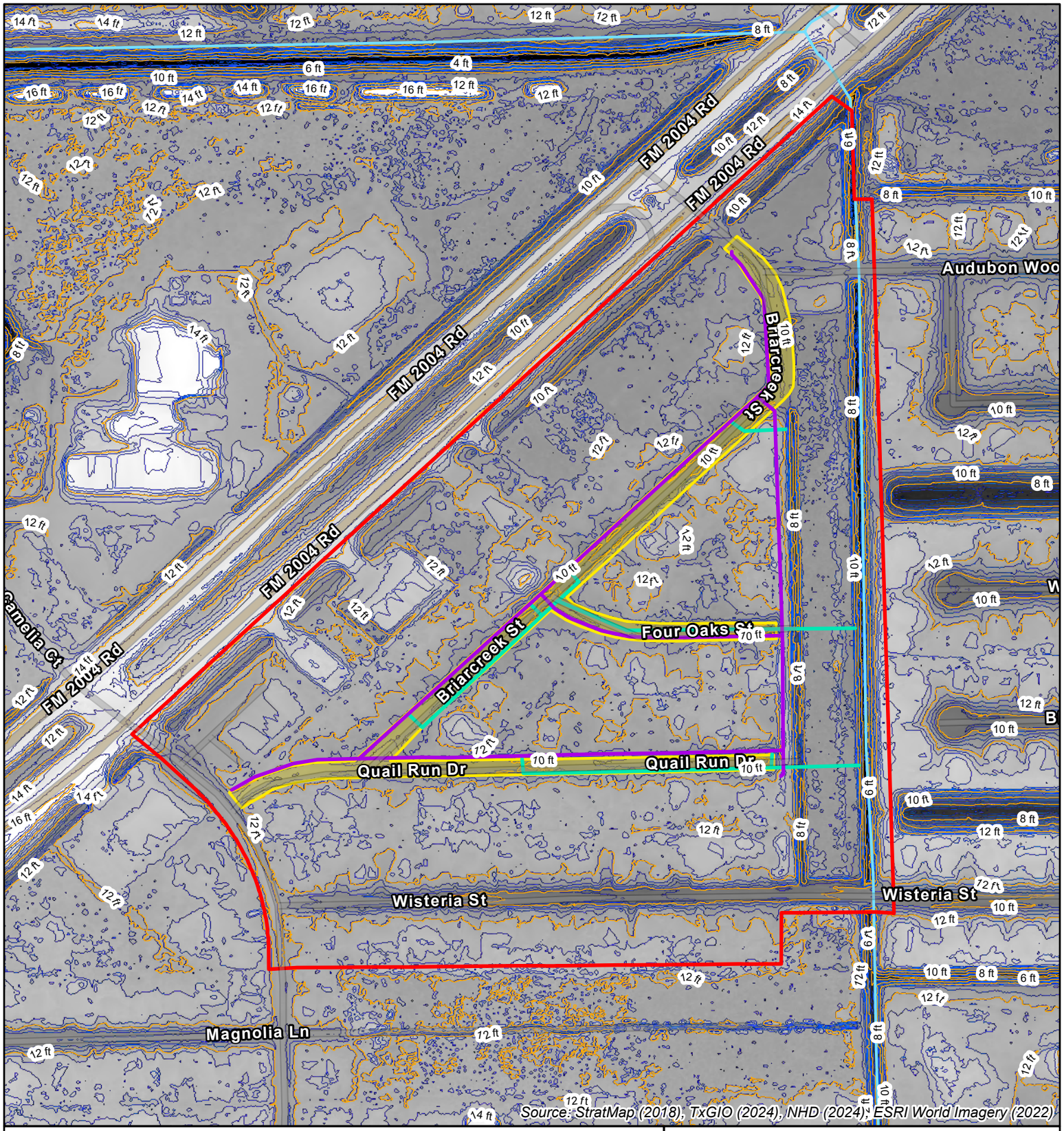
0 200 400 800 1,200 Feet

1 inch = 400 feet

FIGURE 6
FLOODPLAIN MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- NHD Feature
- 6-inch Contour
- 2-foot Contour

Elevation

High: 16 feet

Low: 8 feet

0 150 300 600 900 Feet

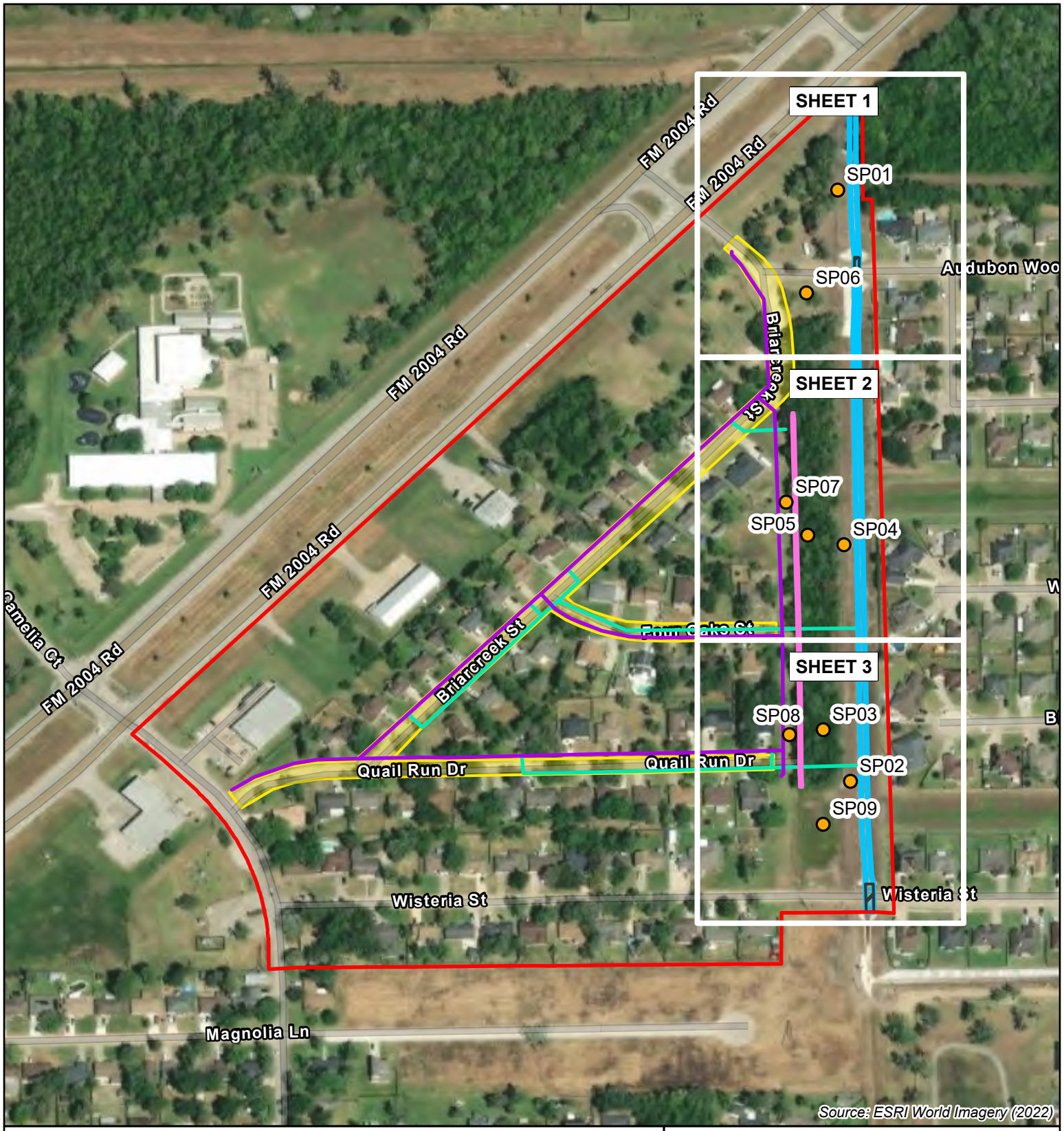
1 inch = 300 feet

N

FIGURE 7
LIDAR MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- Sample Point

Delineated Feature

- Intermittent Ditch
- Drainage Ditch
- Existing Culvert

0 150 300 600 900 Feet

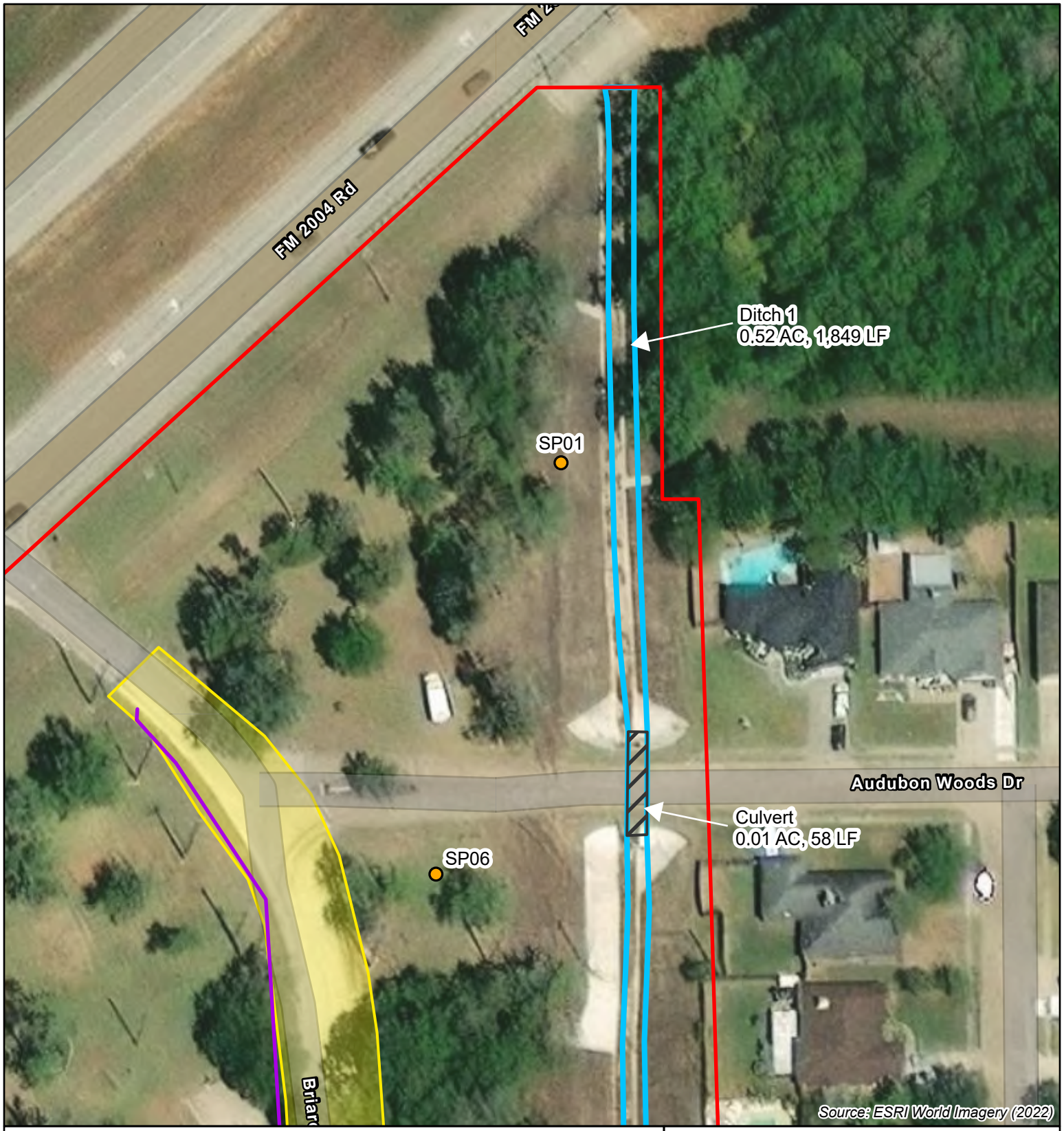
1 inch = 300 feet

N

FIGURE 8 - KEY
SAMPLE POINT LOCATION MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Sample Point

Delineated Feature

- Intermittent Ditch
- Existing Culvert

N

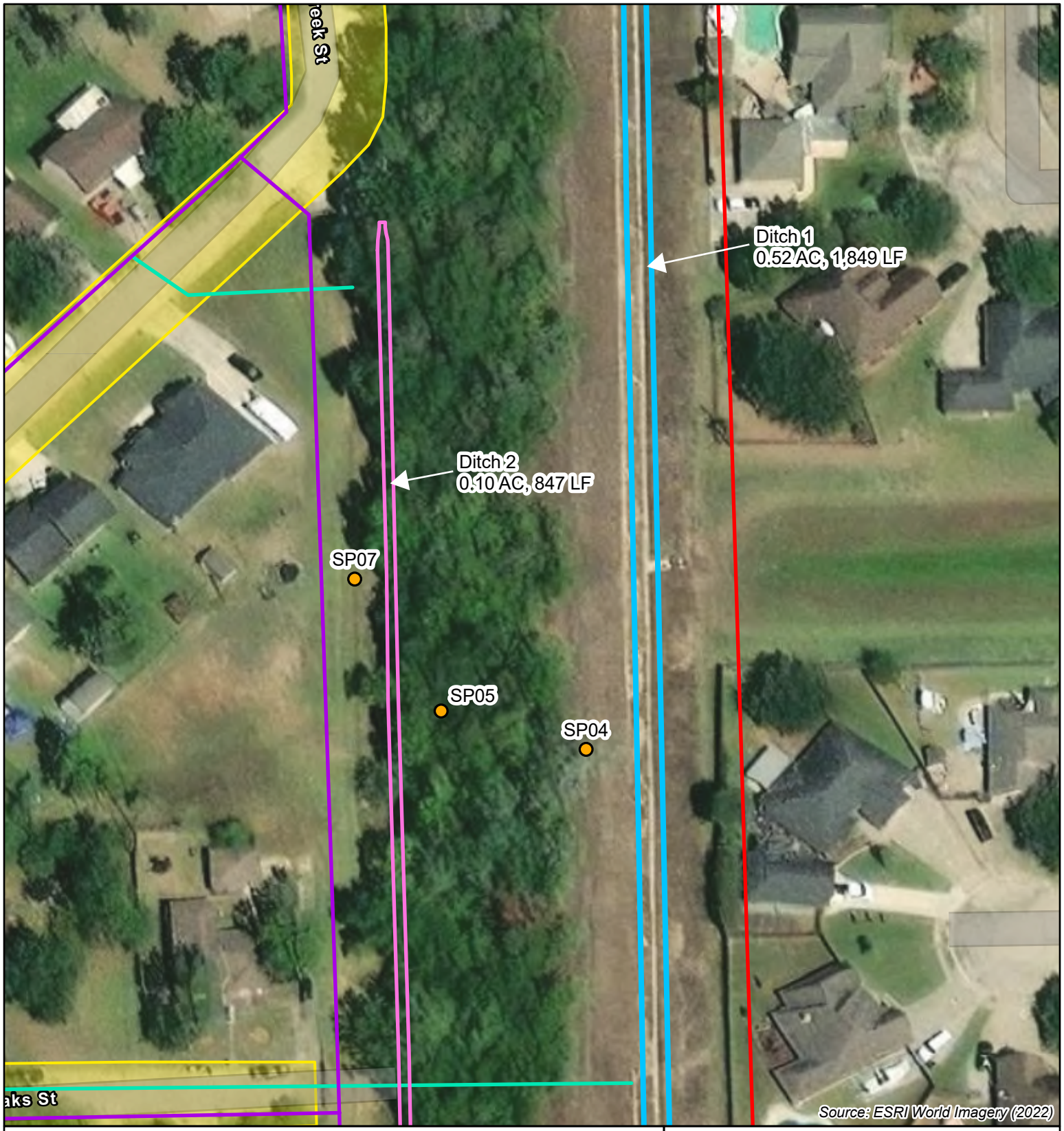
0 37.5 75 150 225 Feet

1 inch = 75 feet

FIGURE 8 - SHEET 1
SAMPLE POINT LOCATION MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- Sample Point

Delineated Feature

- Intermittent Ditch
- Drainage Ditch

0 37.5 75 150 225 Feet

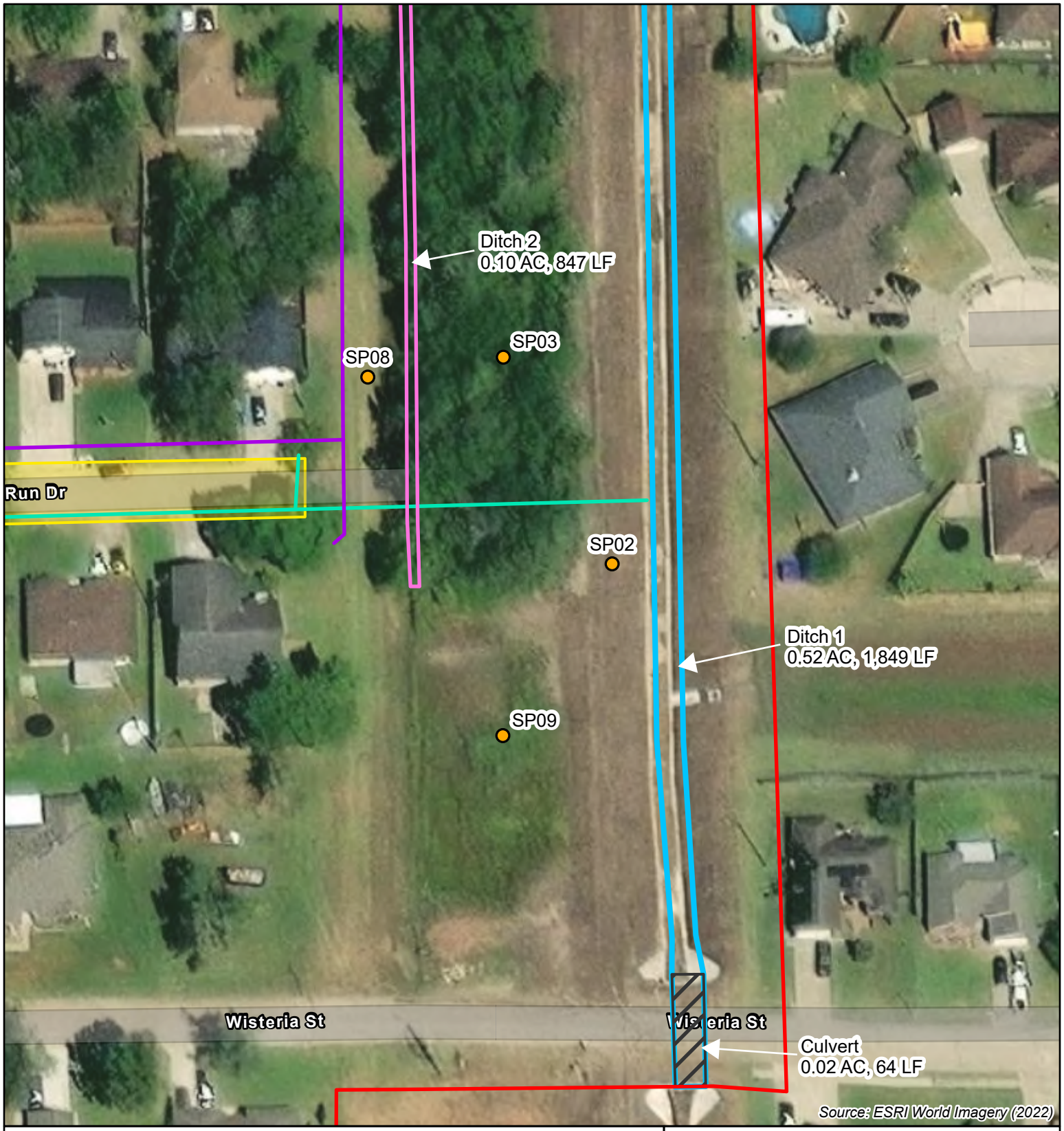
1 inch = 75 feet

N

FIGURE 8 - SHEET 2
SAMPLE POINT LOCATION MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements
- Sample Point

Delineated Feature

- Intermittent Ditch
- Drainage Ditch
- Existing Culvert

0 37.5 75 150 225 Feet

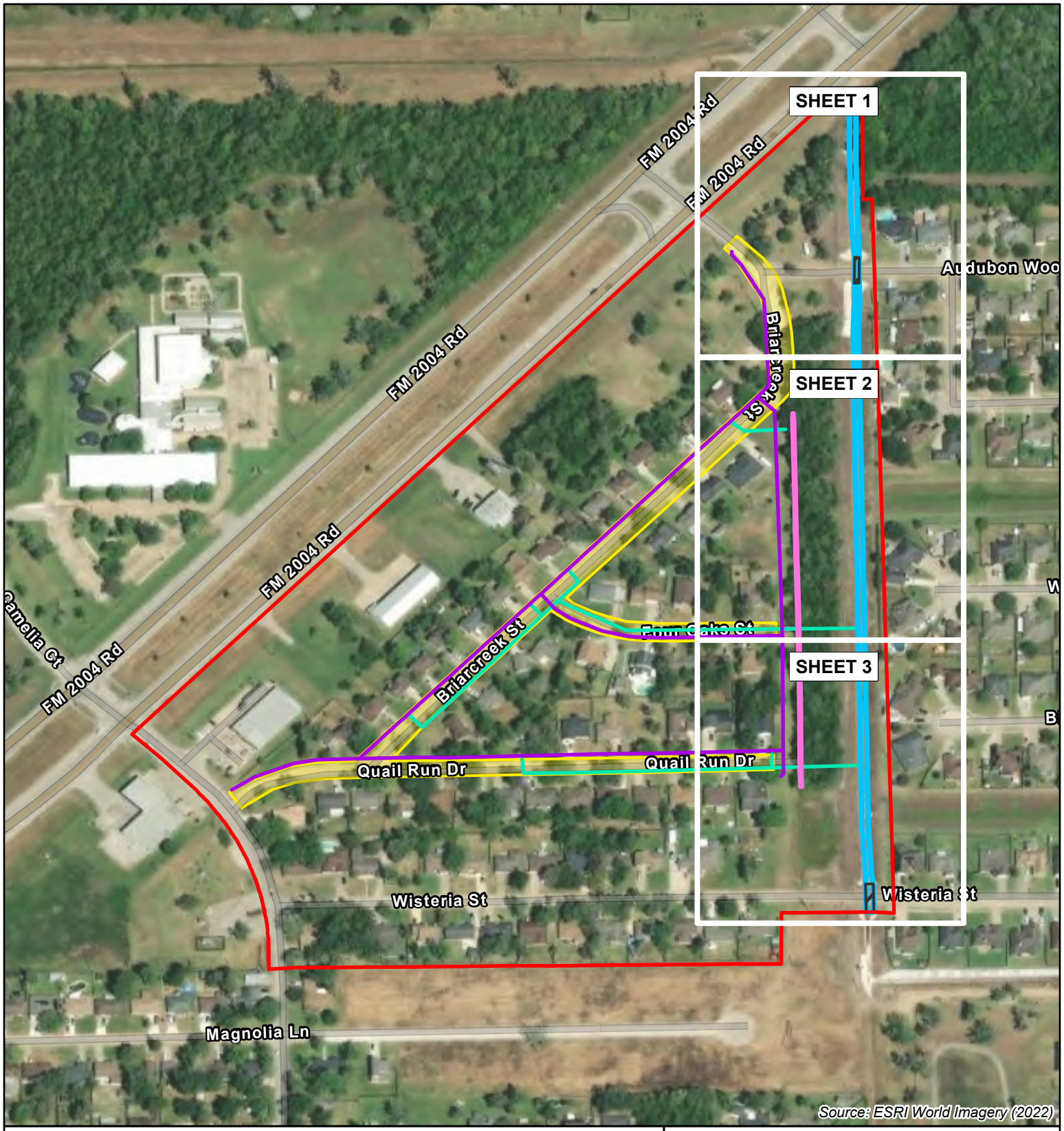
1 inch = 75 feet

N

FIGURE 8 - SHEET 3
SAMPLE POINT LOCATION MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements

Delineated Feature

- Intermittent Ditch
- Drainage Ditch
- Existing Culvert

N

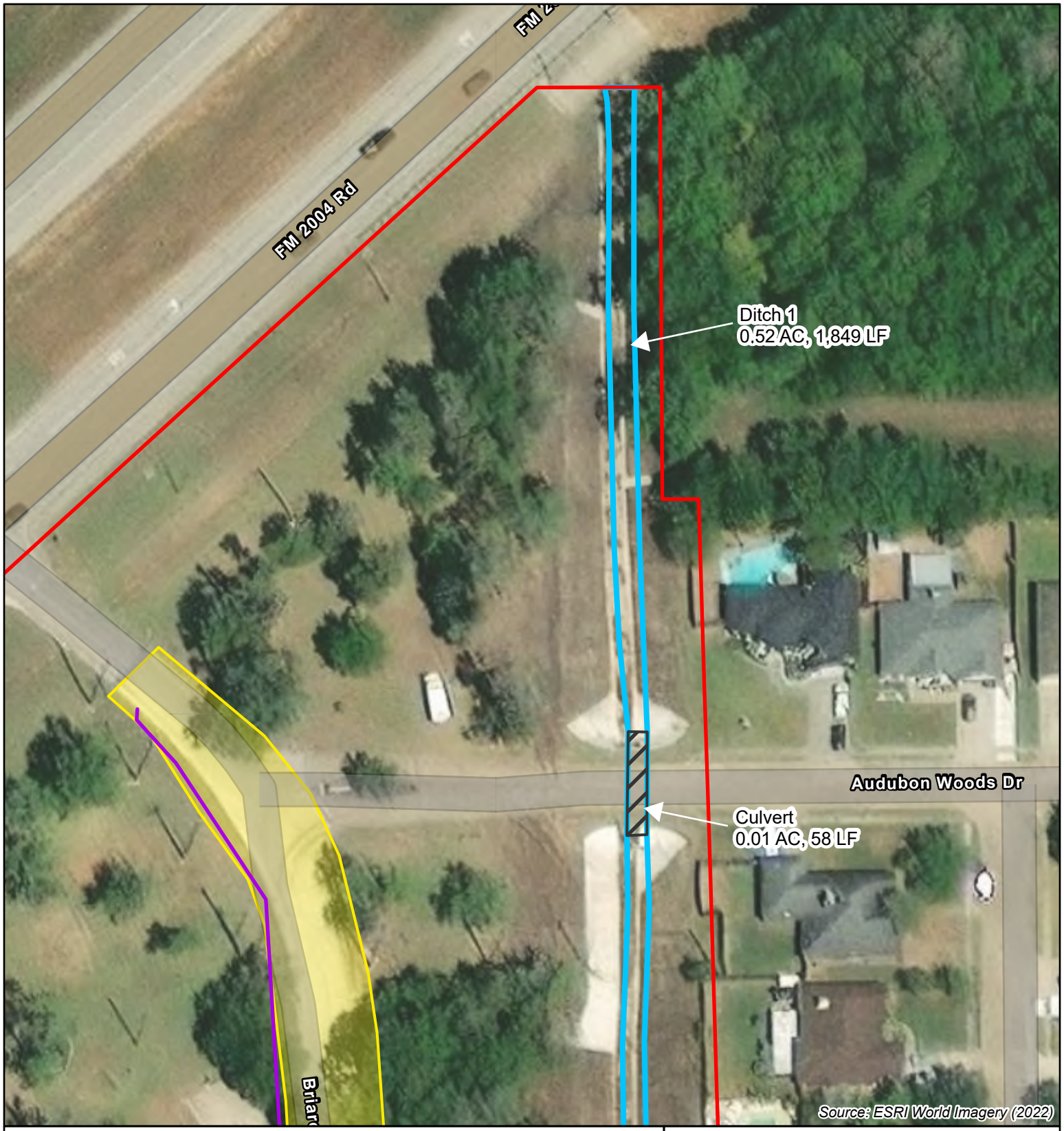
0 150 300 600 900 Feet

1 inch = 300 feet

FIGURE 9 - KEY
DELINEATED FEATURES MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements

Delineated Feature

- Intermittent Ditch
- Existing Culvert

N

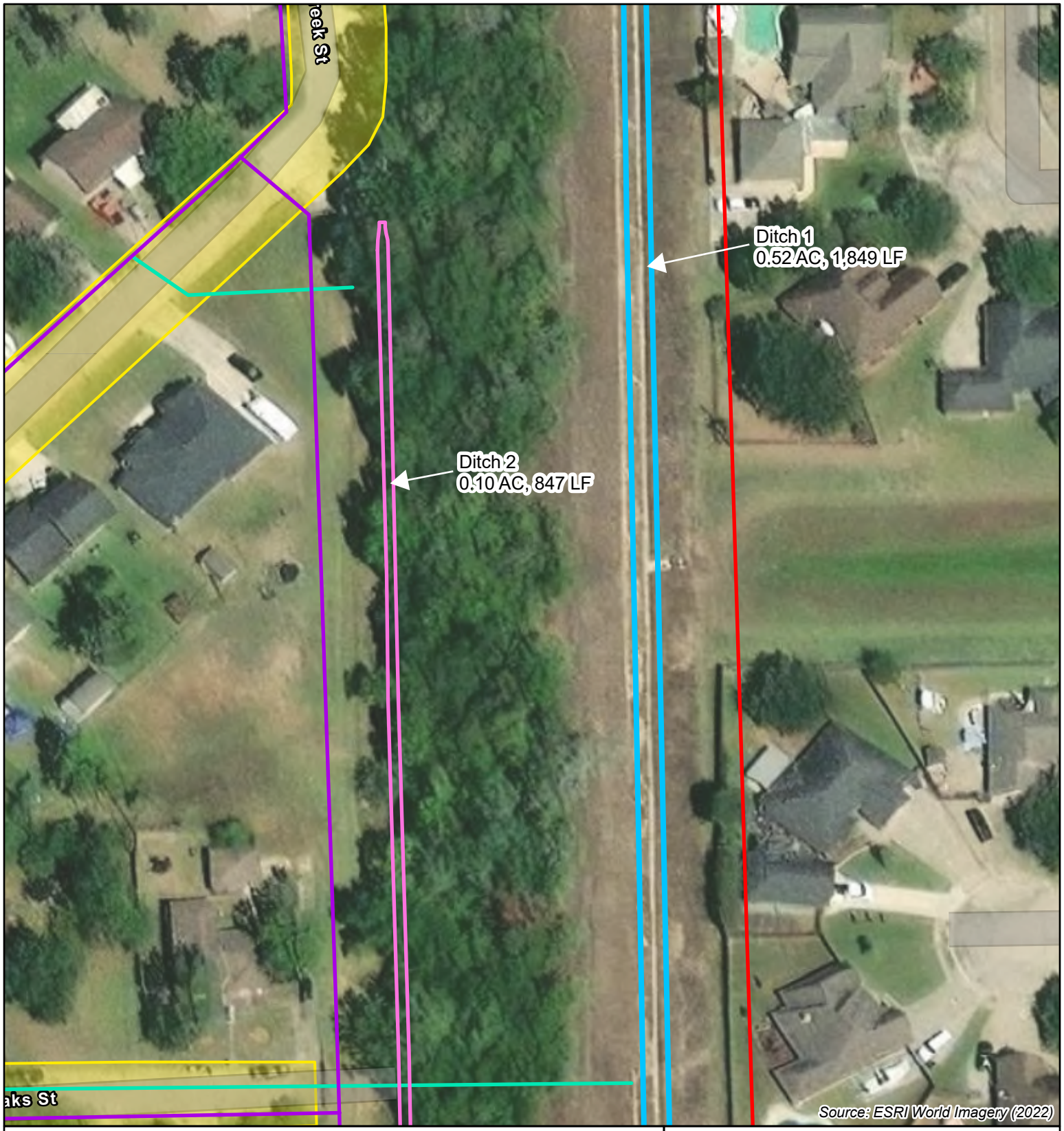
0 37.5 75 150 225 Feet

1 inch = 75 feet

FIGURE 9 - SHEET 1
DELINEATED FEATURES MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements

Delineated Feature

- Intermittent Ditch
- Drainage Ditch

0 37.5 75 150 225 Feet

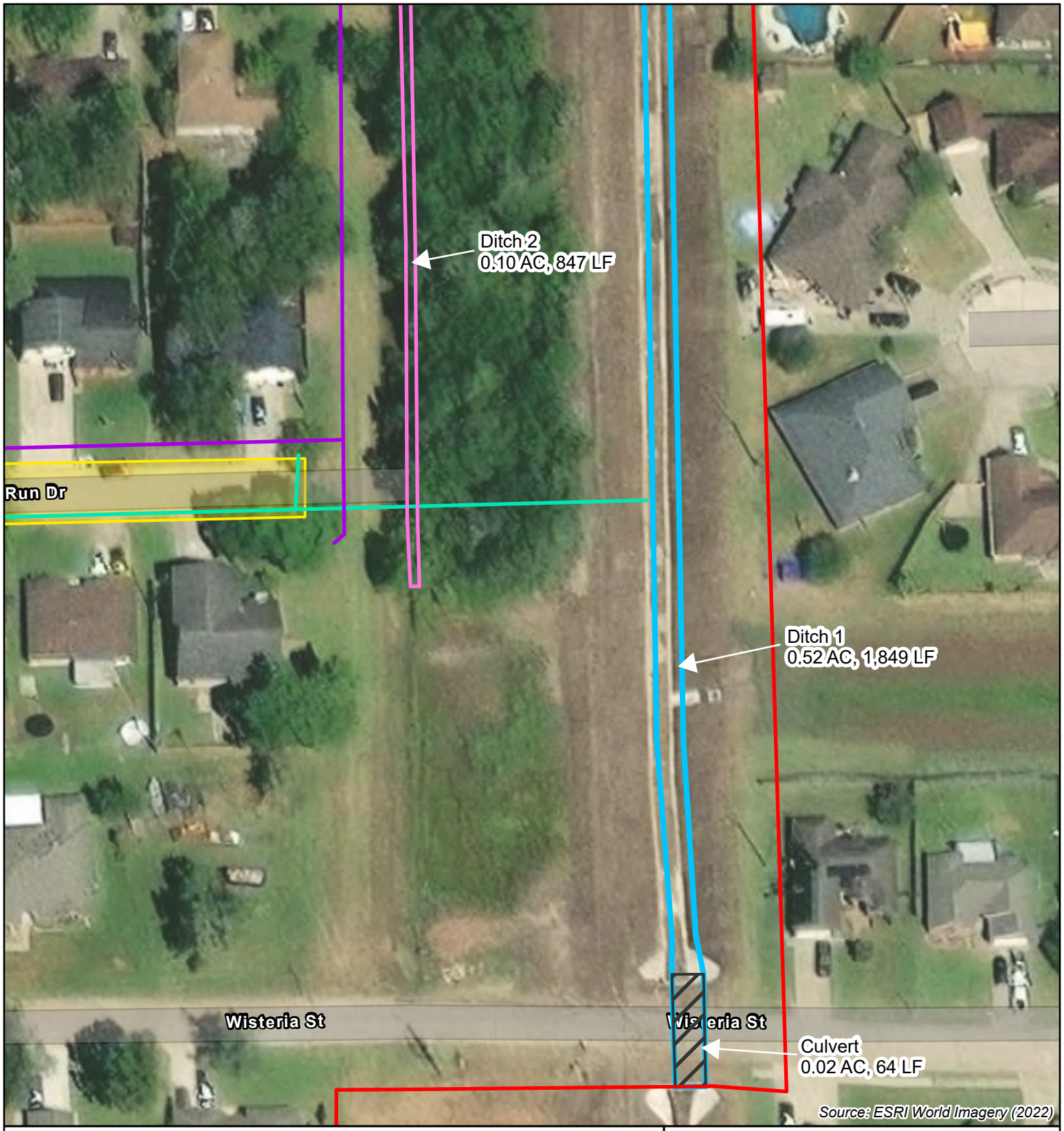
1 inch = 75 feet

N

FIGURE 9 - SHEET 2
DELINEATED FEATURES MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Street Improvements
- Water Line Improvements
- Storm Sewer Improvements

Delineated Feature

- Intermittent Ditch
- Drainage Ditch
- Existing Culvert

N

0 37.5 75 150 225 Feet

1 inch = 75 feet

FIGURE 9 - SHEET 3
DELINEATED FEATURES MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Legend

Review Area

Elevation

High: 16 feet

Low: 8 feet

0 150 300 600 900 Feet

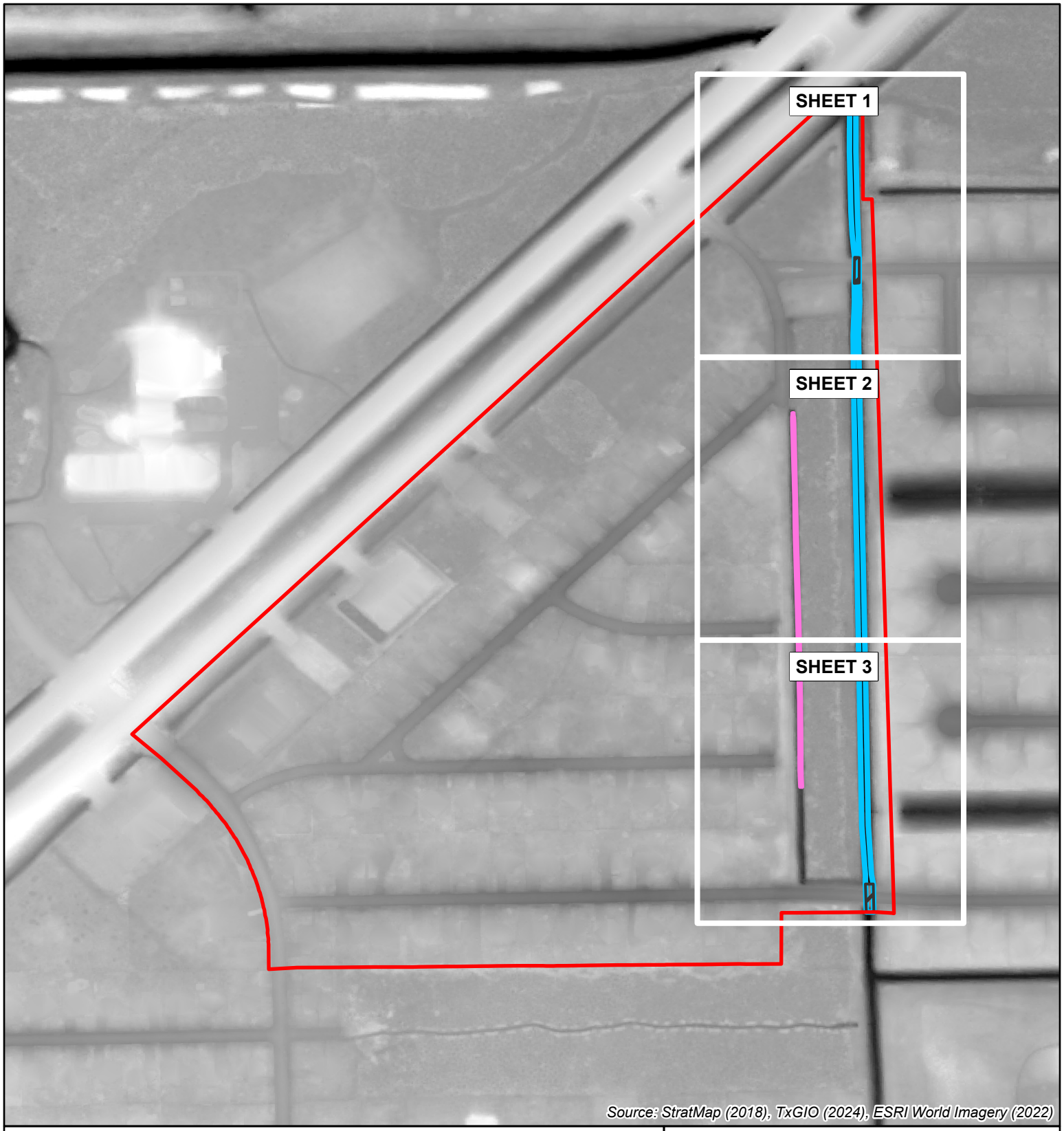
1 inch = 300 feet

N

DIGITAL ELEVATION MODEL MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 5/30/2024



Legend

Review Area

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

Intermittent Ditch

Drainage Ditch

Existing Culvert

0 150 300 600 900 Feet

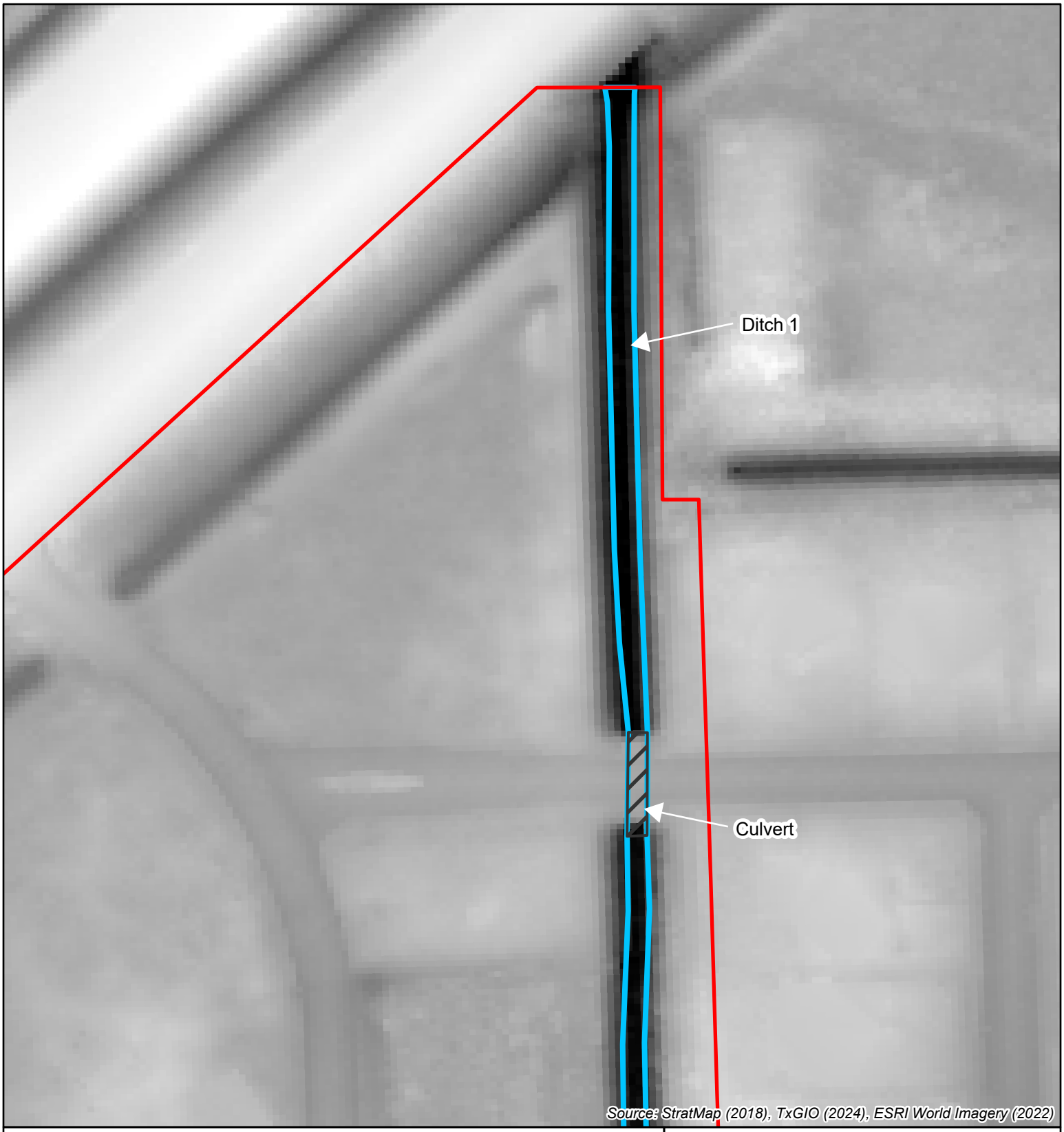
1 inch = 300 feet

N

DIGITAL ELEVATION MODEL WITH DELINEATED FEATURES KEY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

Intermittent Ditch

Existing Culvert

0 37.5 75 150 225 Feet

1 inch = 75 feet

N

SHEET 1
DIGITAL ELEVATION MODEL
WITH DELINEATED FEATURES

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Legend

Review Area

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

Intermittent Ditch

Drainage Ditch

0 37.5 75 150 225 Feet

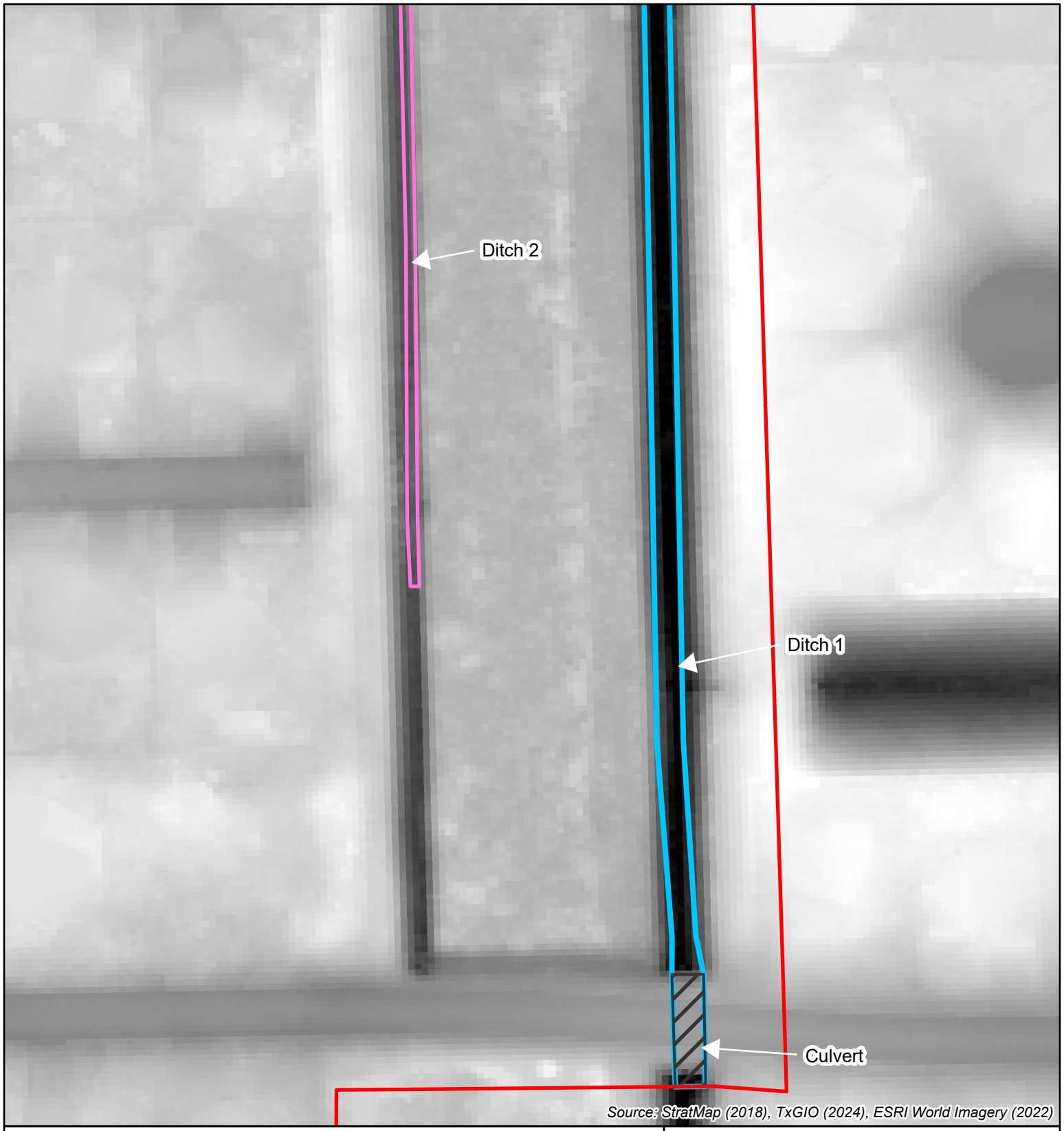
1 inch = 75 feet

N

SHEET 2
DIGITAL ELEVATION MODEL
WITH DELINEATED FEATURES

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

Intermittent Ditch

Drainage Ditch

Existing Culvert

0 37.5 75 150 225 Feet

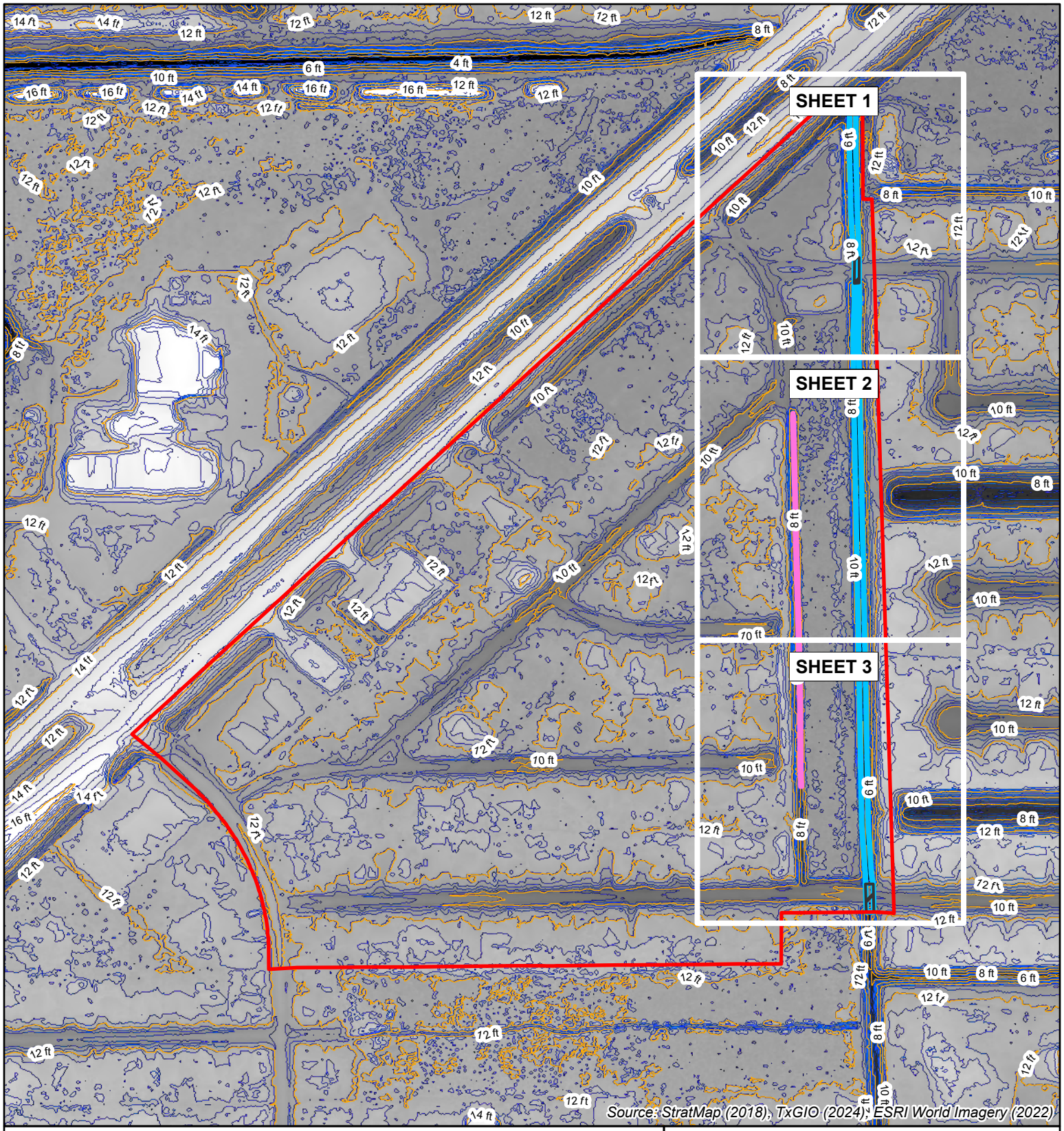
1 inch = 75 feet

N

SHEET 3
DIGITAL ELEVATION MODEL
WITH DELINEATED FEATURES

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- 6-inch Contour
- 2-foot Contour

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

- Intermittent Ditch
- Drainage Ditch
- Existing Culvert

N

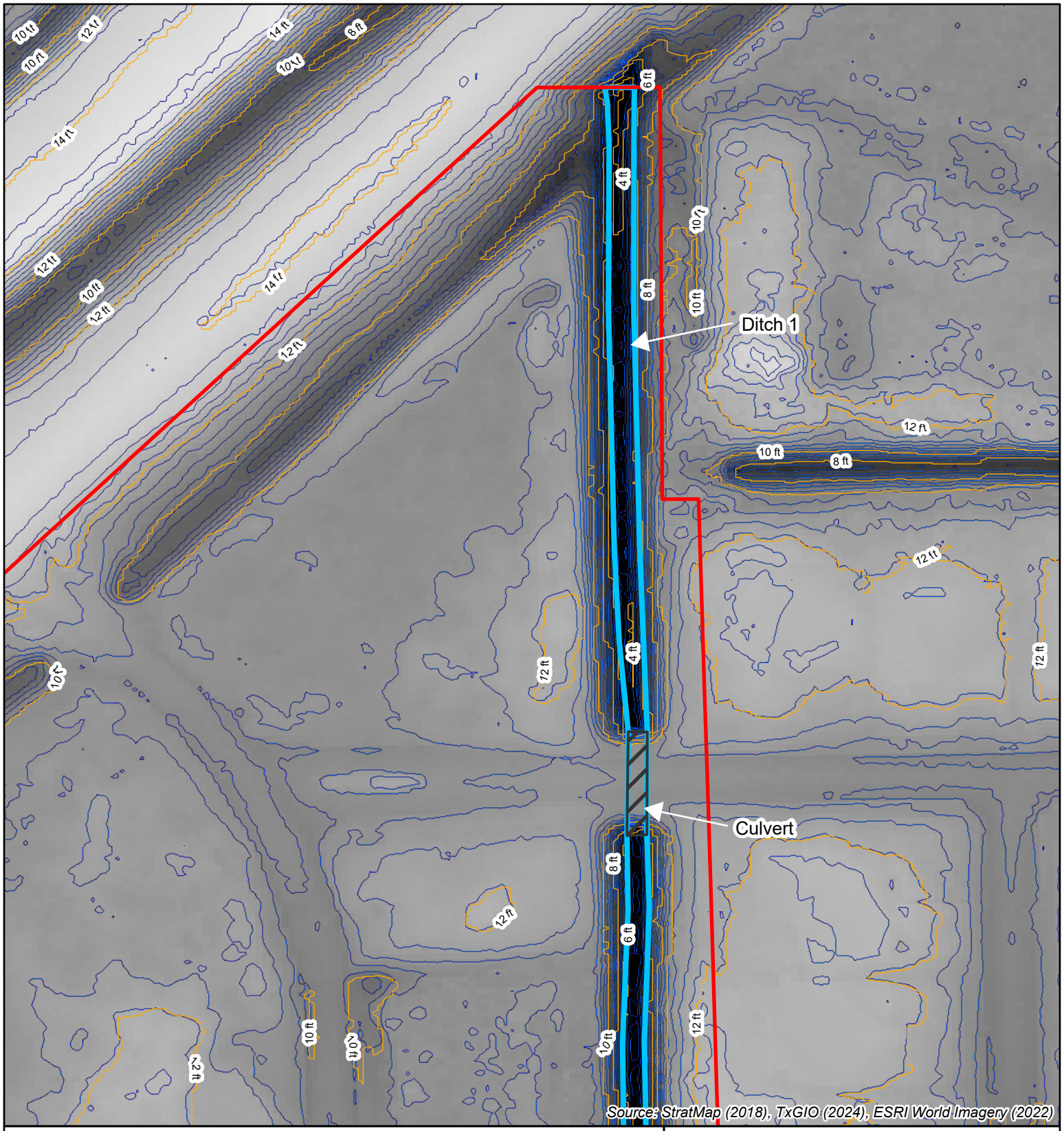
0 150 300 600 900 Feet

1 inch = 300 feet

DEM WITH 6-INCH CONTOURS AND DELINEATED FEATURES KEY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- 6-inch Contour
- 2-foot Contour

Elevation

High: 16 feet

Low: 8 feet

Delineated Feature

- Intermittent Ditch
- Existing Culvert

0 37.5 75 150 225 Feet

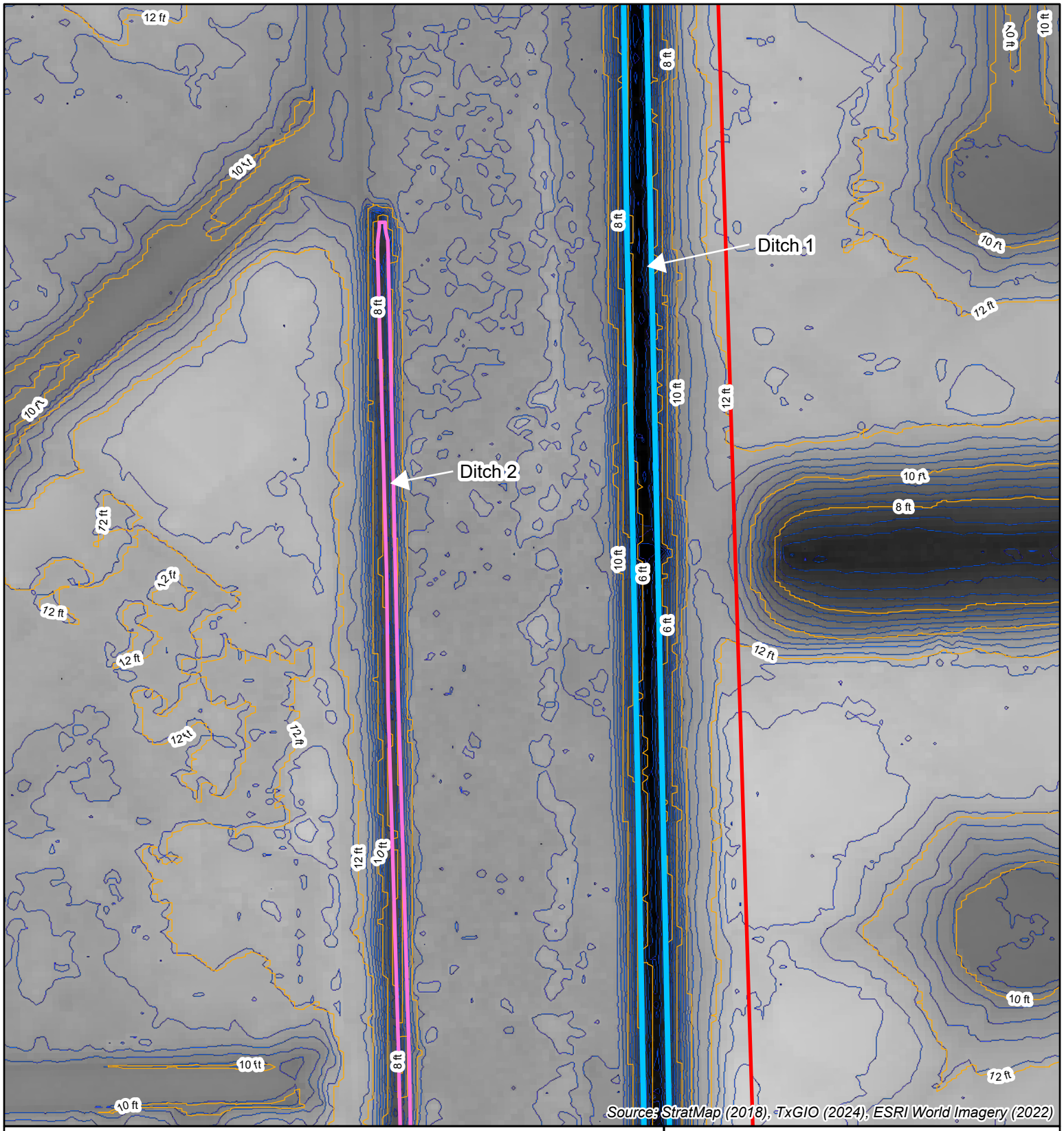
1 inch = 75 feet

N

SHEET 1
DEM WITH 6-INCH CONTOURS AND DELINEATED FEATURES KEY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area

Elevation

- High: 16 feet
- Low: 8 feet

- 6-inch Contour
- 2-foot Contour

Delineated Feature

- Intermittent Ditch
- Drainage Ditch

0 37.5 75 150 225 Feet

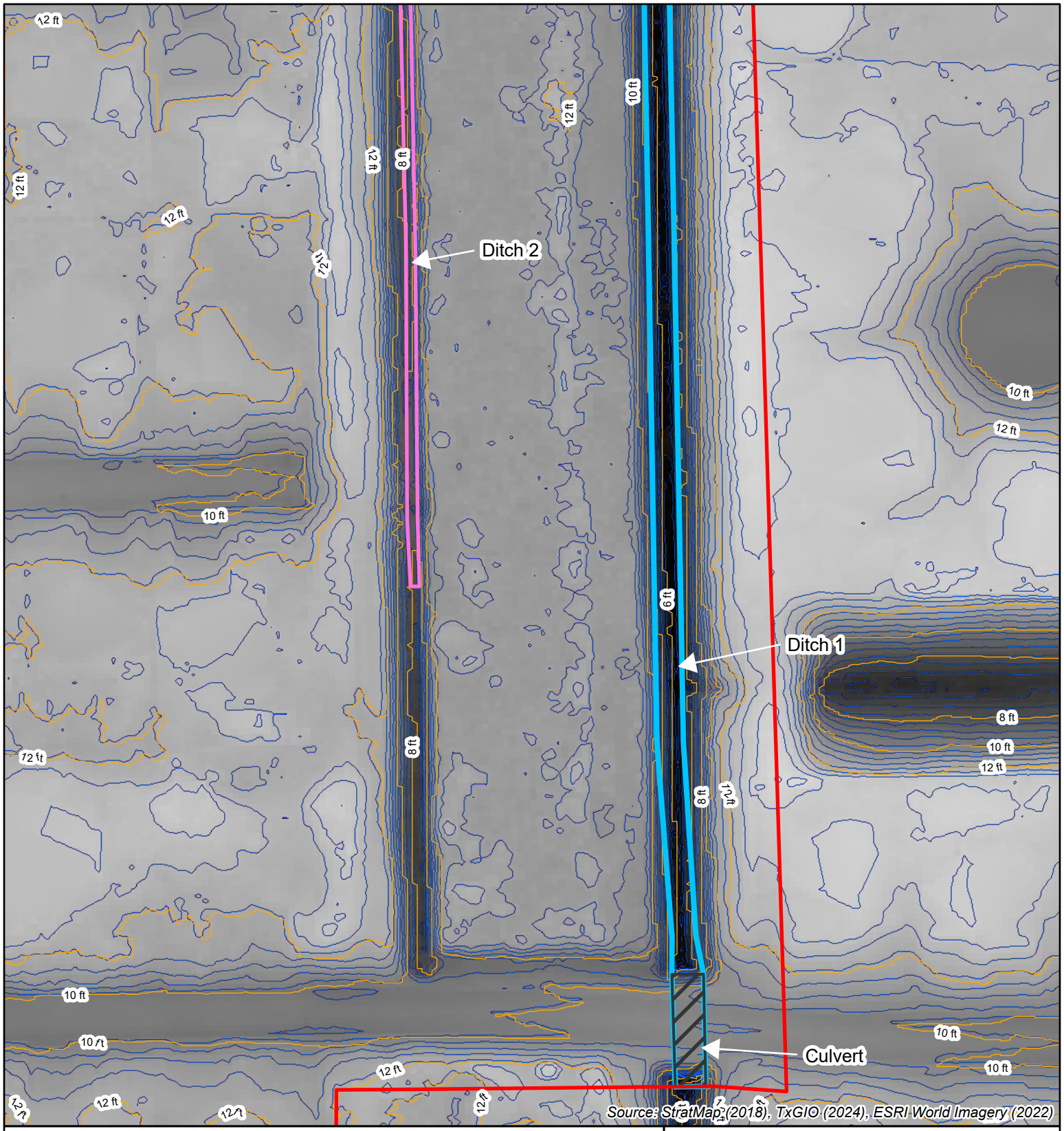
1 inch = 75 feet

N

SHEET 2
DEM WITH 6-INCH CONTOURS AND DELINEATED FEATURES KEY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

- Review Area
- Elevation
  - High: 16 feet
  - Low: 8 feet
- 6-inch Contour
- 2-foot Contour
- Delineated Feature
  - Intermittent Ditch
  - Drainage Ditch
  - Existing Culvert

N

0 37.5 75 150 225 Feet

1 inch = 75 feet

SHEET 3
DEM WITH 6-INCH CONTOURS AND DELINEATED FEATURES KEY MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Appendix B

Site Photographs

Photo 1. Overview of the project area from the north end of the Audubon Woods Subdivision, facing south.

Photo 2. Another overview of the project area from the southeast corner at Quail Run Dr, facing northwest.

Photo 3. View along Briarcrest St within the subdivision, facing north.

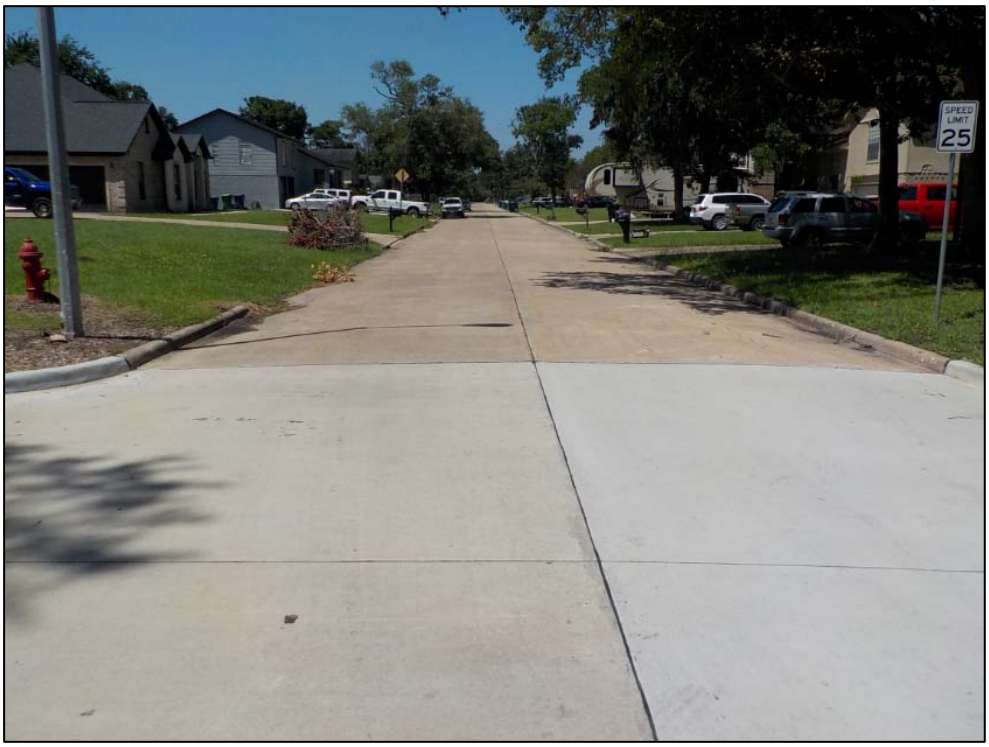


Photo 4. Another view along Briarcrest St within the subdivision, facing southwest.

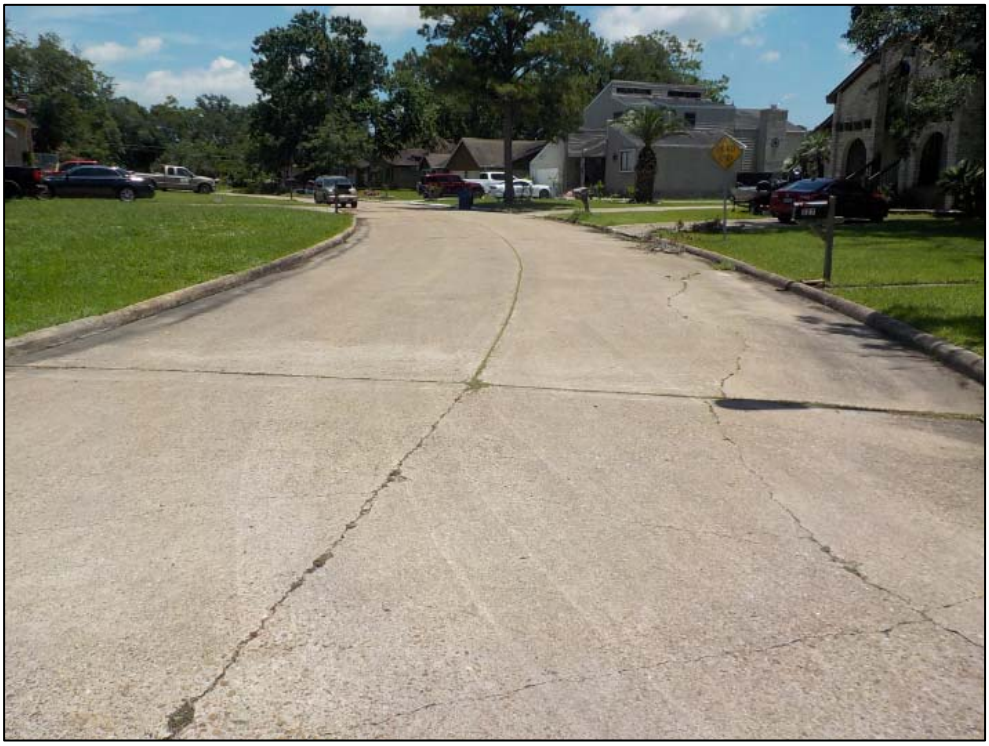


Photo 5. View along Four Oaks St within the subdivision, facing east.

Photo 6. View along Quail Run Dr within the subdivision, facing east.

Photo 7. Overview of the Intermittent Ditch (Ditch 1) located on the eastern boundary of the project area (view from CR 220), facing south (upstream).

Photo 8. Another view of the northern end of Ditch 1 (north of Audubon Woods Dr), facing south (upstream).

Photo 9. Another view of the northern end of Ditch 1 (north of Audubon Woods Dr), facing north (downstream).

Photo 10. View across the Ditch 1 channel near the north end, facing east.

Photo 11. View of the middle portion of Ditch 1 (south of Audubon Woods Dr), facing south (upstream).

Photo 12. Another view of the middle portion of Ditch 1 (south of Audubon Woods Dr), facing north (upstream).

Photo 13. View across the Ditch 1 channel near the middle of the segment in the review area, facing east.

Photo 14. View of the southern end of Ditch 1 (south of Quail Run Dr), facing south (upstream).

Photo 15. Another view of the south end of Ditch 1 (south of Quail Run Dr), facing north (downstream).

Photo 16. View of the upstream end of Ditch 2 (stormwater drainage ditch), which originates from a stormwater outfall pipe from the subdivision storm sewer system, facing south (downstream).

Photo 17. Another view of Ditch 2, facing north (upstream).

Photo 18. Another view of Ditch 2, facing south (downstream).

Photo 19. View across the Ditch 2 channel, facing east.

Photo 20. View of upland sample point SP01, facing south.

Photo 21. View of upland sample point SP02, facing north.

Photo 22. View of upland sample point SP03, facing north.

Photo 23. View of upland sample point SP04, facing north.

Photo 24. View of upland sample point SP05, facing north.

Photo 25. View of upland sample point SP06, facing east.

Photo 26. View of upland sample point SP07, facing south.

Photo 27. View of upland sample point SP08, facing south.

Photo 28. View of upland sample point SP09, facing west.

Appendix C

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP01

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.069774 Long: -95.414803 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP01

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Paspalum notatum	40	Y	FACU
2. Calyptocarpus vialis	25	Y	FAC
3. Digitaria sanguinalis	20	N	FACU
4. Bothriochloa ischaemum	10	N	UPL
5. Cyperus esculentus	5	N	FACW
6. Taraxacum officinale	5	N	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	105 = Total Cover		

50% of total cover: 52.5 20% of total cover: 21

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP02

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Maintained berm Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.066102 Long: -95.414730 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP02

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Cynodon dactylon	40	Y	FACU
2. Bothriochloa ischaemum	20	N	UPL
3. Ambrosia trifida	20	N	FAC
4. Paspalum notatum	10	N	FACU
5. Calyptocarpus vialis	10	N	FAC
6. Coreopsis lanceolata	5	N	UPL
7. Mimosa pudica	5	N	FACU
8.			
9.			
10.			
11.			
12.			
	110 = Total Cover		

50% of total cover: 55 20% of total cover: 22

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP03

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Woodland Local relief (concave, convex, none): None Slope (%): 1-2%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.066422 Long: -95.414894 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP03

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus nigra	80	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 20')			
1. Ilex vomitoria	40	Y	FAC
2. Morus rubra	20	Y	FACU
3. Quercus nigra	10	N	FAC
4. Sabal minor	2	N	FACW
5.			
6.			
7.			
8.			
	72 = Total Cover		
50% of total cover: 36	20% of total cover: 14.4		
Herb Stratum (Plot size: 10')			
1. Malvaviscus arboreus	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 10')			
1. Campsis radicans	20	Y	FAC
2. Smilax rotundifolia	10	Y	FAC
3. Toxicodendron radicans	10	Y	FAC
4.			
5.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is met.

SOIL

Sampling Point: SP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP04

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Maintained berm Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.067579 Long: -95.414767 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP04

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus nigra	80	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80 = Total Cover		
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 20')			
1. Ilex vomitoria	40	Y	FAC
2. Morus rubra	20	Y	FACU
3. Quercus nigra	10	N	FAC
4. Sabal minor	2	N	FACW
5.			
6.			
7.			
8.			
	72 = Total Cover		
50% of total cover: 36	20% of total cover: 14.4		
Herb Stratum (Plot size: 10')			
1. Malvaviscus arboreus	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 10')			
1. Campsis radicans	20	Y	FAC
2. Smilax rotundifolia	10	Y	FAC
3. Toxicodendron radicans	10	Y	FAC
4.			
5.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 85.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is met.

SOIL

Sampling Point: SP04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP05

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Maintained berm Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.067643 Long: -95.414986 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP05

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus nigra	40	Y	FAC
2. Quercus virginiana	40	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	80	= Total Cover	
50% of total cover: 40	20% of total cover: 16		
Sapling/Shrub Stratum (Plot size: 20')			
1. Ilex vomitoria	40	Y	FAC
2. Morus rubra	20	Y	FACU
3. Quercus nigra	10	N	FAC
4. Ligustrum japonicum	10	N	FAC
5. Sabal minor	2	N	FACW
6.			
7.			
8.			
	82	= Total Cover	
50% of total cover: 36	20% of total cover: 14.4		
Herb Stratum (Plot size: 10')			
1. Malvaviscus arboreus	10	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	10	= Total Cover	
50% of total cover: 5	20% of total cover: 2		
Woody Vine Stratum (Plot size: 10')			
1. Campsis radicans	20	Y	FAC
2. Smilax rotundifolia	10	Y	FAC
3. Toxicodendron radicans	10	Y	FAC
4.			
5.			
	40	= Total Cover	
50% of total cover: 20	20% of total cover: 8		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

✓ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is met.

SOIL

Sampling Point: SP05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP06

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.069139 Long: -95.414989 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP06

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Paspalum notatum	50	Y	FACU
2. Stenotaphrum secundatum	30	Y	FAC
3. Cynodon dactylon	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP07

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Maintained berm Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.067823 Long: -95.415106 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: SP07

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Paspalum notatum	50	Y	FACU
2. Stenotaphrum secundatum	30	Y	FAC
3. Cynodon dactylon	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP07

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP08

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Maintained berm Local relief (concave, convex, none): None Slope (%): 1%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.066393 Long: -95.415101 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP08

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Paspalum notatum	50	Y	FACU
2. Stenotaphrum secundatum	30	Y	FAC
3. Cynodon dactylon	20	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	N/A				Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

Hydric soil criteria is not met.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: City of Richwood Flood & Drainage Improvements (2022-100107-RMP) City/County: Richwood, Brazoria County Sampling Date: 06/06/2024

Applicant/Owner: City of Richwood State: TX Sampling Point: SP09

Investigator(s): M. Fontenot (PWS #2202) Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): Dry bottom basin Local relief (concave, convex, none): Concave Slope (%): 0%

Subregion (LRR or MLRA): LRR-T, MLRA-150B Lat: 29.065833 Long: -95.414883 Datum: WGS 84

Soil Map Unit Name: 36: Pledger clay, 0 to 1 percent slopes, rarely flooded NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** ✓
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Not a wetland sample point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): N/A
Water Table Present?	Yes _____	No ✓	Depth (inches): N/A
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): N/A

Wetland Hydrology Present? **Yes** _____ **No** ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology criteria is not met.

Based on the USACE Antecedent Precipitation Tool, normal conditions were present.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: SP09

Tree Stratum (Plot size: 20')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 20')			
1. N/A			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 10')			
1. Cynodon dactylon	50	Y	FACU
2. Paspalum notatum	40	Y	FACU
3. Coreopsis lanceolata	10	N	UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 10')			
1. N/A			
2.			
3.			
4.			
5.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation criteria is not met.

SOIL

Sampling Point: SP09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/2	100	N/A				Clay	
8-16	10YR 4/2	97	10YR 4/6	3	C	M	Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

Hydric soil criteria is met.

Appendix D

GPS Data Table

GPS Attribute Table

FID	Shape	Comment	Max PDOP	Max HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Unfiltered Positions	Filtered Positions	Horizontal Precision	Standard Deviation	Latitude	Longitude	Offset
0	Point	SP01	5.8	1.9	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	11:46:19am	22	22	0.3	0.762609	29.0697651	-95.414785	
1	Point	box culverts 3qty 5ft	5.6	2	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:52:48am	24	24	0.1	0.087045	29.0703495	-95.414717	
2	Point	box culverts 3qty 5ft	6.5	2.4	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:53:26am	24	24	0.1	0.086223	29.0703931	-95.414667	
3	Point	D1-1	2.3	1.1	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:54:59am	20	20	0.1	0.023034	29.070339	-95.414671	
4	Point	D1-2	3.6	1.4	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	11:55:32am	20	20	0.1	0.198557	29.0703256	-95.414713	
5	Point	D1-3	2.4	1.1	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:56:09am	20	20	0.1	0.279889	29.0702583	-95.414671	
6	Point	D1-4	4.1	2	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:56:36am	20	20	0.1	0.040189	29.0702574	-95.41471	
7	Point	D1-5	3.8	1.8	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:57:35am	22	22	0.1	0.034057	29.0700023	-95.414671	
8	Point	D1-6	2.8	1.2	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:58:07am	20	20	0.2	0.10295	29.0700044	-95.414711	
9	Point	D1-7	6.9	5.6	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	11:59:42am	24	24	0.1	0.159604	29.069631	-95.414662	
10	Point	D1-8	5.9	2	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:00:13pm	20	20	0.1	0.028281	29.0696293	-95.414702	
11	Point	D1-9	6.6	2.6	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:00:53pm	20	20	0.1	0.048174	29.069489	-95.414657	
12	Point	D1-10	5.6	3.1	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:01:21pm	20	20	0.1	0.079277	29.0694866	-95.414694	
13	Point	Box culvert	5.6	3	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:02:00pm	20	20	0.1	0.031616	29.0693462	-95.41465	
14	Point	Box culvert	2.1	1	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:02:27pm	20	20	0.1	0.036596	29.0693469	-95.41468	
15	Point	Box culvert	6.1	3.1	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:04:18pm	20	20	0.1	0.248495	29.0691852	-95.414682	
16	Point	Box culvert	5.9	5.1	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:04:44pm	20	20	0.1	0.042371	29.0691865	-95.414651	
17	Point	D1-11	2.4	1.1	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:05:22pm	20	20	0.1	0.125842	29.0690729	-95.414647	
18	Point	D1-12	5.8	1.9	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:05:56pm	20	20	0.1	0.123842	29.0690692	-95.41468	
19	Point	D1-13	2.4	1.1	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:06:41pm	20	20	0.1	0.005016	29.0688643	-95.414655	
20	Point	D1-14	3.8	1.6	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:07:09pm	21	21	0.1	0.030199	29.0688613	-95.414689	
21	Point	D1-15	2.5	1.2	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:08:23pm	21	21	0.1	0.066067	29.0683763	-95.414645	
22	Point	D1-16	3.1	1.3	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:08:52pm	20	20	0.1	0.093089	29.0683749	-95.414682	
23	Point	D1-17	6.6	3	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:10:52pm	20	20	0.2	0.088597	29.0675004	-95.414627	
24	Point	D1-18	4.7	2.2	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:11:21pm	21	21	0.2	0.352474	29.0674994	-95.414665	
25	Point	D1-19	5.5	2	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:13:17pm	24	24	0.1	0.112937	29.0666004	-95.414609	
26	Point	D1-20	2.7	1.3	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:13:49pm	20	20	0.2	0.100477	29.0665986	-95.414649	
27	Point	D1-21	3.5	1.7	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:17:07pm	20	20	0.1	0.089718	29.0658097	-95.414594	
28	Point	D1-22	3.7	1.9	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:17:35pm	20	20	0.1	0.049509	29.0658101	-95.414636	
29	Point	D1-23	4.3	1.8	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:20:41pm	20	20	0.1	0.056709	29.0655077	-95.414575	
30	Point	D1-24	3.2	2	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:21:09pm	20	20	0.1	0.039296	29.0655047	-95.414612	
31	Point	box culverts 2qty 6ft	5.4	2.6	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:21:43pm	18	18	0.1	0.109976	29.0654473	-95.414612	
32	Point	box culverts 2qty 6ft	3.1	1.5	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:22:15pm	20	20	0.1	0.042077	29.0654476	-95.414563	
33	Point	box culverts 2qty 6ft	2.9	1.8	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:24:42pm	20	20	0.1	0.036534	29.0652793	-95.414559	
34	Point	box culverts 2qty 6ft	3.5	1.7	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:25:39pm	20	20	0.1	0.069535	29.0652797	-95.414607	
35	Point	D1-25	2.6	1.2	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:28:05pm	20	20	0.2	0.04747	29.0652059	-95.414568	
36	Point	D1-26	4.4	3.5	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:28:33pm	49	49	0.2	0.090051	29.065206	-95.414605	
37	Point	SP02	4	1.4	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:33:07pm	26	26	0.3	0.041578	29.0660859	-95.414705	
38	Point	SP03	6.3	2.3	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:40:08pm	27	27	0.2	0.115847	29.0664074	-95.414874	

GPS Attribute Table

FID	Shape	Comment	Max PDOP	Max HDOP	Correction Type	Receiver Type	GPS Date	GPS Time	Unfiltered Positions	Filtered Positions	Horizontal Precision	Standard Deviation	Latitude	Longitude	Offset
39	Point	SP04	5.6	1.7	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	12:50:13pm	20	20	0.1	0.032522	29.0675583	-95.414746	
40	Point	SP05	1.9	1.2	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	12:58:23pm	20	20	0.2	0	29.067618	-95.414971	
41	Point	SP06	3	1.5	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	01:06:00pm	20	20	0.1	0.062003	29.0691252	-95.414979	
42	Point	36in pipe culvert	4.1	1.8	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	01:10:45pm	24	24	0.6	0.098566	29.0683781	-95.415064	
43	Point	SP07	4.2	1.3	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	01:12:22pm	20	20	0.1	0.085706	29.0678232	-95.415106	
44	Point	D2-1 west 5ft ohwm	6.6	2.7	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	01:12:58pm	20	20	0.1	0.347657	29.0678293	-95.415056	
45	Point	D2-2 west 5ft ohwm	4.1	1.2	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	01:15:32pm	21	21	0.6	0.159374	29.0676316	-95.415054	
46	Point	D2-3 west 5ft ohwm	4.3	1.8	L1 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	01:18:37pm	23	23	0.5	0.07174	29.0670871	-95.415038	
47	Point	D2-4 west 5ft ohwm	2.9	1.1	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	01:20:03pm	21	21	0.2	0.025827	29.0665841	-95.415026	
48	Point	SP08	3.9	1.9	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	01:21:05pm	18	18	0.1	0.084389	29.0663765	-95.415085	
49	Point	D2-6 west 5ft ohwm	2.9	1.1	Postprocessed Code	Geo 7X (H-Star)	6/6/2024	01:22:25pm	20	20	0.7	0	29.0661543	-95.415024	
50	Point	SP09	4.1	2.9	L1L2 Postprocessed Carrier Float	Geo 7X (H-Star)	6/6/2024	01:25:25pm	20	20	0.1	0.113554	29.0658187	-95.414875	

Appendix E

Historical Aerial Photographs

1995 Aerial Image

City of Richwood
2022-100107-RMP
Flood and Drainage Improvements Project
Richwood, Texas 77531

2004 Aerial Image

City of Richwood
2022-100107-RMP
Flood and Drainage Improvements Project
Richwood, Texas 77531

2010 Aerial Image

City of Richwood
2022-100107-RMP
Flood and Drainage Improvements Project
Richwood, Texas 77531

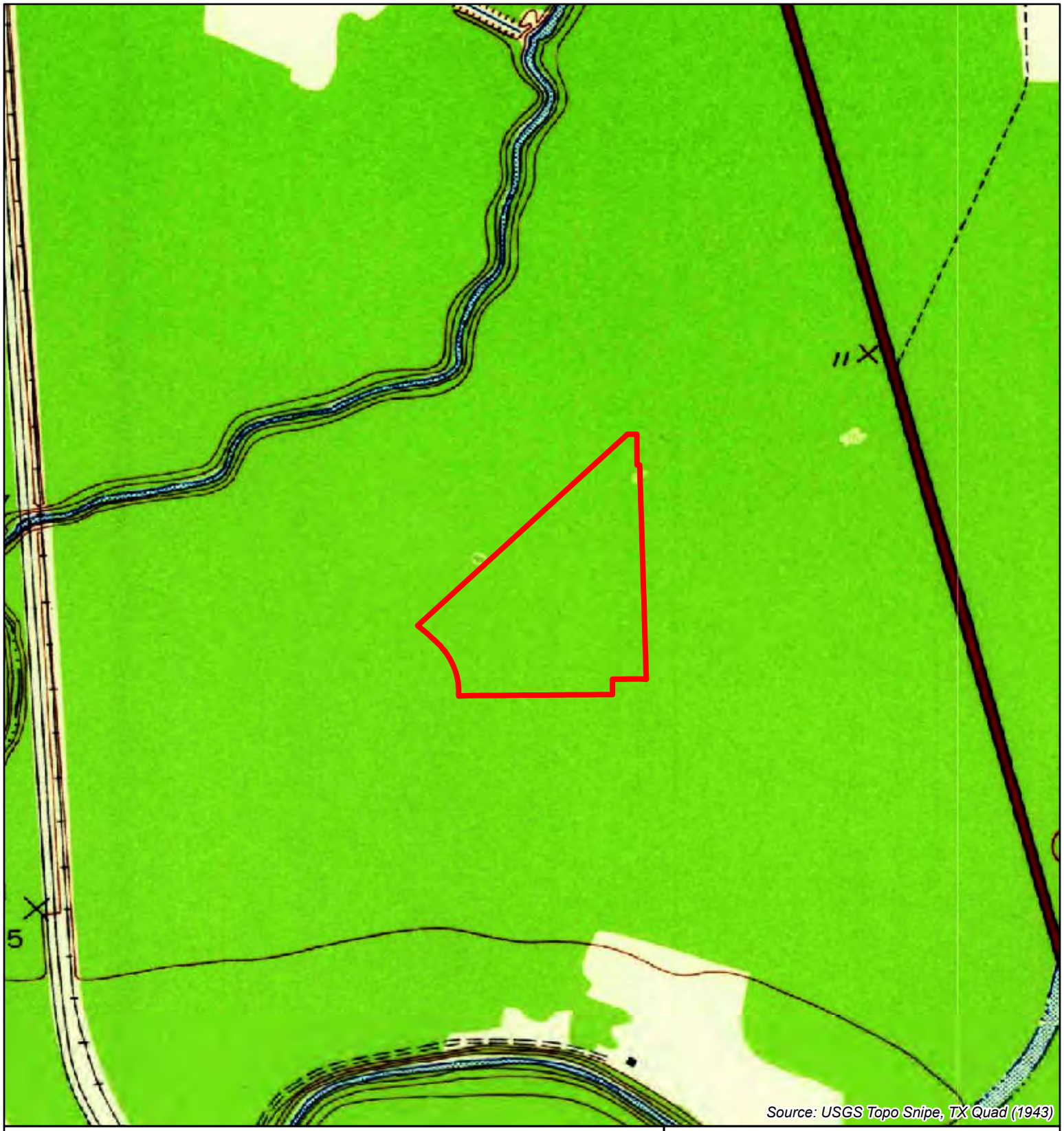

2015 Aerial Image
City of Richwood
2022-100107-RMP
Flood and Drainage Improvements Project
Richwood, Texas 77531
Google Earth
Image © 2024 Maxar Technologies
N
2000 ft

2022 Aerial Image

City of Richwood
2022-100107-RMP
Flood and Drainage Improvements Project
Richwood, Texas 77531

Appendix F

Historical Topographic Maps



Legend

Review Area

N

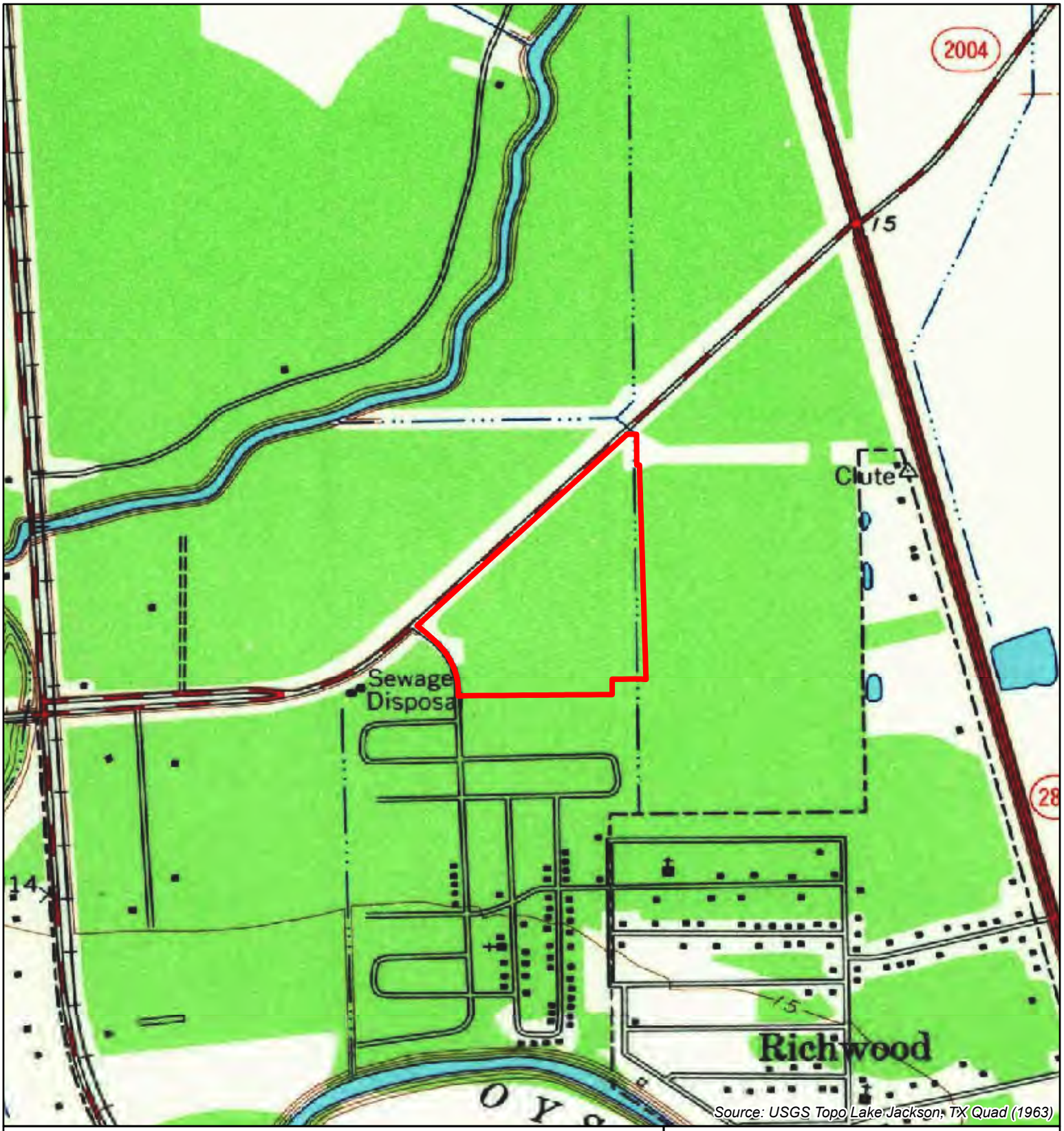
0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

1943 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

N

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

1963 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Legend

Review Area

N

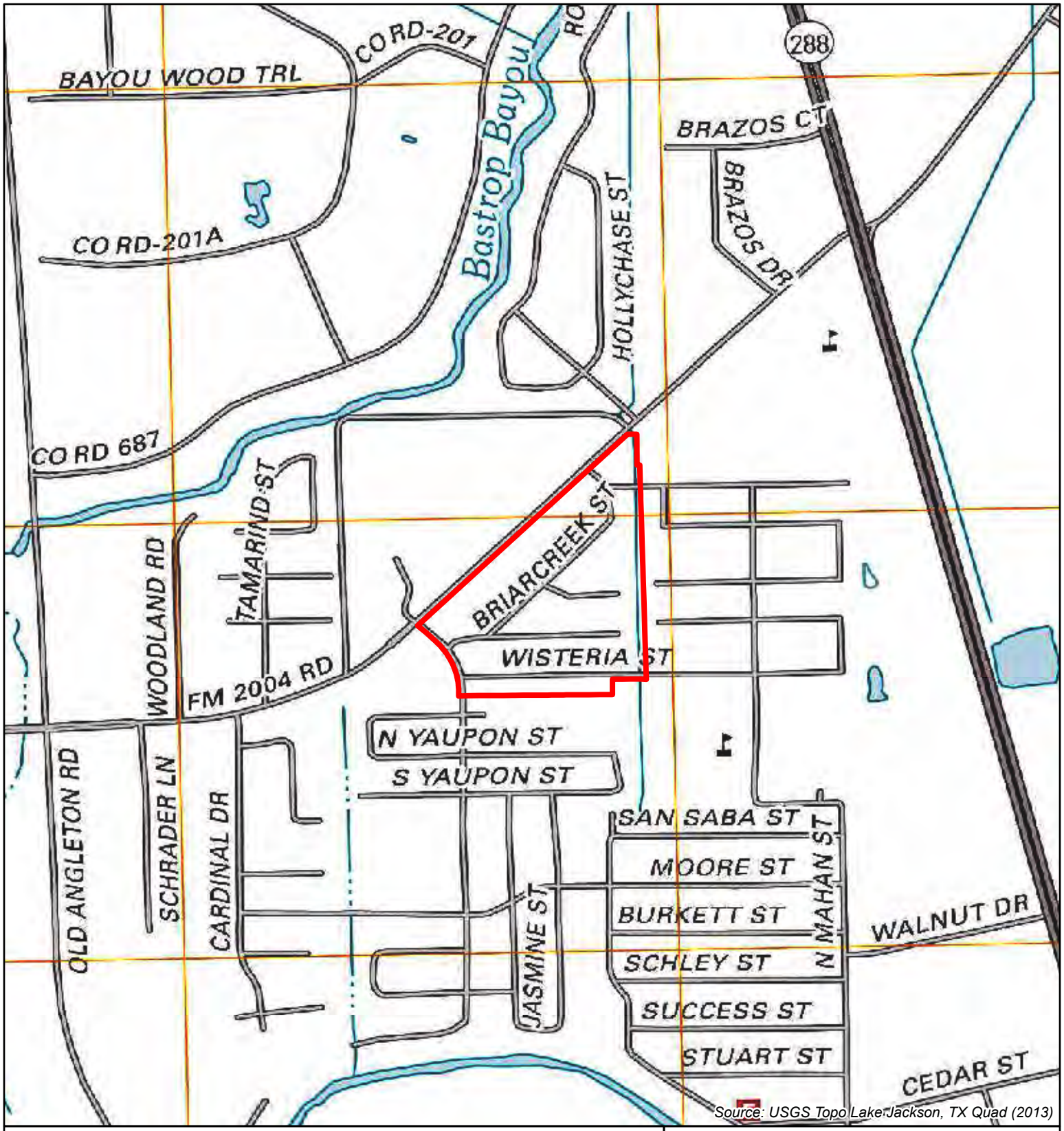
0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

1974 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

N

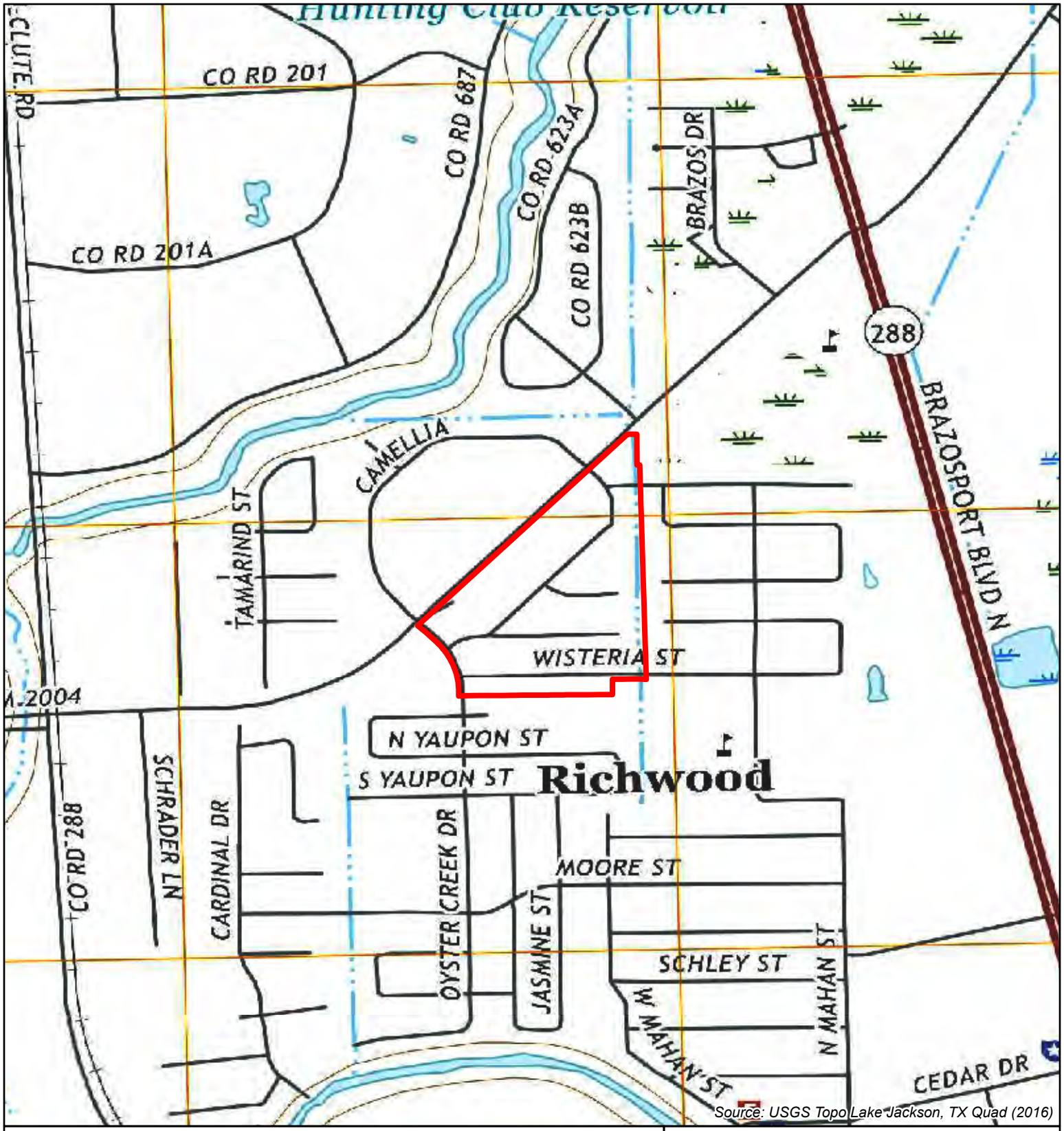
0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

2013 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

N

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

2016 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Legend

Review Area

N

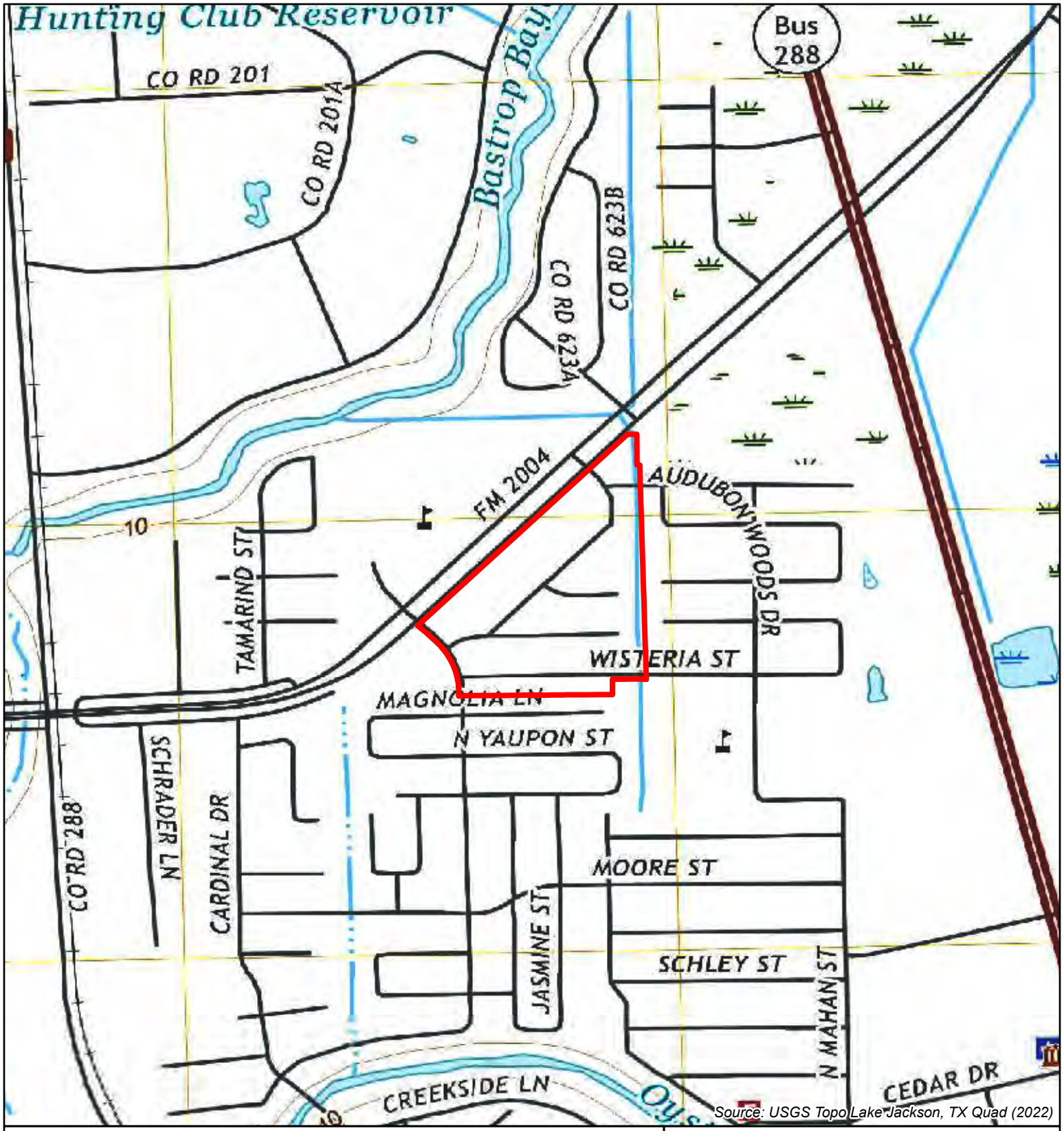
0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

2019 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024



Legend

Review Area

N

0 500 1,000 2,000 3,000 Feet

1 inch = 1,000 feet

2022 TOPOGRAPHIC MAP

CITY OF RICHWOOD
2022-100107-RMP
FLOOD AND DRAINAGE
IMPROVEMENTS PROJECT
RICHWOOD, TEXAS 77531

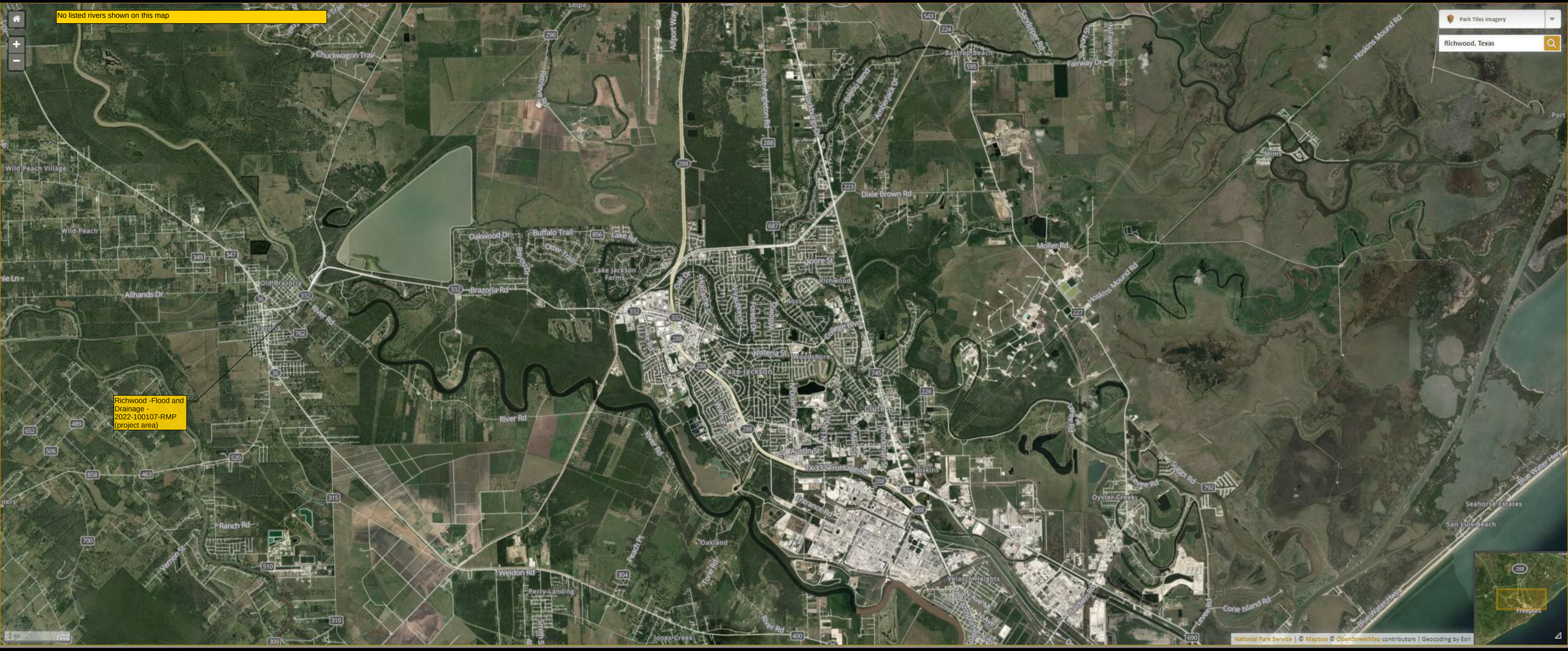
Prepared By: Cypress Environmental Consulting LLC
Project Number: 024466
Date: 6/7/2024

Wild and Scenic Rivers

Nationwide Rivers Inventory

This is a listing of more than 3,200 free-flowing river segments in the U.S. that are believed to possess one or more "outstandingly remarkable" values.

National Park Service
U.S. Department of the Interior



Environmental Justice

Environmental Justice (CEST and EA)

General requirements	Legislation	Regulation
Determine if the project creates adverse environmental impacts upon a low-income or minority community. If it does, engage the community in meaningful participation about mitigating the impacts or move the project.	Executive Order 12898	
References		
https://www.hudexchange.info/environmental-review/environmental-justice		

HUD strongly encourages starting the Environmental Justice analysis only after all other laws and authorities, including Environmental Assessment factors if necessary, have been completed.

1. **Were any adverse environmental impacts identified in any other compliance review portion of this project's total environmental review?**

   ☐Yes → *Continue to Question 2.*

   X No → *Based on the response, the review is in compliance with this section. Continue to the Worksheet Summary below.*

2. **Were these adverse environmental impacts disproportionately high for low-income and/or minority communities?**

   ☐Yes

   Explain:

   → *Continue to Question 3. Provide any supporting documentation.*

   ☐No

   Explain:

   → *Continue to the Worksheet Summary and provide any supporting documentation.*

3. **All adverse impacts should be mitigated. Explain in detail the proposed measures that must be implemented to mitigate for the impact or effect, including the timeline for implementation.**

☐Mitigation as follows will be implemented:

→ *Continue to Question 4.*

☐No mitigation is necessary.

Explain why mitigation will not be made here:

→ *Continue to Question 4.*

4. **Describe how the affected low-income or minority community was engaged or meaningfully involved in the decision on what mitigation actions, if any, will be taken.**

→ *Continue to the Worksheet Summary and provide any supporting documentation.*

Worksheet Summary

Compliance Determination

Provide a clear description of your determination and a synopsis of the information that it was based on, such as:

- Map panel numbers and dates
- Names of all consulted parties and relevant consultation dates
- Names of plans or reports and relevant page numbers
- Any additional requirements specific to your region

No adverse environmental impacts were identified in any other compliance review portion of this project's total environmental review.

Are formal compliance steps or mitigation required?

☐ Yes

☐ No

EJSCREEN ACS Summary Report

Location: User-specified point center at 29.066632, -95.416353
Ring (buffer): 1.0-miles radius
Description: Richwood -Flood and Drainage - 2022-100107-RMP

Summary of ACS Estimates	2017 - 2021
Population	4,825
Population Density (per sq. mile)	1,309
People of Color Population	2,352
% People of Color Population	49%
Households	1,700
Housing Units	1,816
Housing Units Built Before 1950	23
Per Capita Income	40,204
Land Area (sq. miles) (Source: SF1)	3.69
% Land Area	97%
Water Area (sq. miles) (Source: SF1)	0.13
% Water Area	3%

	2017 - 2021 ACS Estimates	Percent	MOE (±)
Population by Race			
Total	4,825	100%	569
Population Reporting One Race	4,491	93%	1,410
White	3,596	75%	524
Black	255	5%	262
American Indian	10	0%	135
Asian	60	1%	88
Pacific Islander	0	0%	14
Some Other Race	570	12%	387
Population Reporting Two or More Races	335	7%	353
Total Hispanic Population	1,978	41%	631
Total Non-Hispanic Population	2,848		
White Alone	2,474	51%	530
Black Alone	255	5%	262
American Indian Alone	0	0%	14
Non-Hispanic Asian Alone	60	1%	88
Pacific Islander Alone	0	0%	14
Other Race Alone	13	0%	73
Two or More Races Alone	47	1%	81
Population by Sex			
Male	2,455	51%	350
Female	2,370	49%	312
Population by Age			
Age 0-4	332	7%	145
Age 0-17	1,292	27%	338
Age 18+	3,534	73%	354
Age 65+	547	11%	128

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2017 - 2021 .

EJSCREEN ACS Summary Report

Location: User-specified point center at 29.066632, -95.416353
Ring (buffer): 1.0-miles radius
Description: Richwood -Flood and Drainage - 2022-100107-RMP

	2017 - 2021 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	3,143	100%	479
Less than 9th Grade	131	4%	106
9th - 12th Grade, No Diploma	212	7%	135
High School Graduate	750	24%	219
Some College, No Degree	796	25%	187
Associate Degree	341	11%	135
Bachelor's Degree or more	913	29%	144
Population Age 5+ Years by Ability to Speak English			
Total	4,493	100%	547
Speak only English	3,396	76%	524
Non-English at Home[1+2+3+4]	1,097	24%	352
[1]Speak English "very well"	969	22%	350
[2]Speak English "well"	87	2%	101
[3]Speak English "not well"	35	1%	87
[4]Speak English "not at all"	6	0%	77
[3+4]Speak English "less than well"	41	1%	116
[2+3+4]Speak English "less than very well"	128	3%	134
Linguistically Isolated Households*			
Total	7	100%	39
Speak Spanish	7	100%	31
Speak Other Indo-European Languages	0	0%	14
Speak Asian-Pacific Island Languages	0	0%	14
Speak Other Languages	0	0%	14
Households by Household Income			
Household Income Base	1,700	100%	196
< $15,000	76	4%	66
$15,000 - $25,000	28	2%	36
$25,000 - $50,000	297	17%	187
$50,000 - $75,000	340	20%	140
$75,000 +	960	56%	198
Occupied Housing Units by Tenure			
Total	1,700	100%	196
Owner Occupied	1,403	83%	195
Renter Occupied	297	17%	167
Employed Population Age 16+ Years			
Total	3,711	100%	501
In Labor Force	2,466	66%	355
Civilian Unemployed in Labor Force	92	4%	80
Not In Labor Force	1,245	34%	242

Data Note: Datail may not sum to totals due to rounding. Hispanic population can be of anyrace.
N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)
*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report

Location: User-specified point center at 29.066632, -95.416353
Ring (buffer): 1.0-miles radius
Description: Richwood -Flood and Drainage - 2022-100107-RMP

	2017 - 2021 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	3,924	100%	306
English	2,768	71%	432
Spanish	1,113	28%	364
French, Haitian, or Cajun	0	0%	12
German or other West Germanic	8	0%	13
Russian, Polish, or Other Slavic	0	0%	14
Other Indo-European	23	1%	37
Korean	0	0%	14
Chinese (including Mandarin, Cantonese)	0	0%	14
Vietnamese	0	0%	14
Tagalog (including Filipino)	12	0%	18
Other Asian and Pacific Island	0	0%	14
Arabic	0	0%	14
Other and Unspecified	0	0%	14
Total Non-English	1,156	29%	529

Data Note: Detail may not sum to totals due to rounding. Hispanic popultion can be of any race.
N/A meansnot available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2017 - 2021.
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJSCREEN Census 2010 Summary Report

Location: User-specified point center at 29.066632, -95.416353
Ring (buffer): 1.0-miles radius
Description: Richwood -Flood and Drainage - 2022-100107-RMP

Summary	Census 2010
Population	3,769
Population Density (per sq. mile)	1,088
People of Color Population	1,413
% People of Color Population	0.37497247362614416%
Households	1,284
Housing Units	1,386
Land Area (sq. miles)	3.46
% Land Area	0.9664390637492101%
Water Area (sq. miles)	0.12
% Water Area	0.033560936250789965%

Population by Race	Number	Percent
Total	3,769	-------
Population Reporting One Race	3,659	).9708387414773564%
White	3,009	).7983043719624143%
Black	232	06155024202257641%
American Indian	21	05491091619232541%
Asian	63	16814604555622004%
Pacific Islander	1	.7710953119675644%
Some Other Race	333	.0884013217863144%
Population Reporting Two or More Races	110	29161258522643507%
Total Hispanic Population	1,054	.2795421269487486%
Total Non-Hispanic Population	2,715	).7204578730512516%
White Alone	2,356	.6250275263738558%
Black Alone	221	05854940278270667%
American Indian Alone	10	27591680607863024%
Non-Hispanic Asian Alone	61	.6221355875551274%
Pacific Islander Alone	0	7103429101494E-05%
Other Race Alone	6	16556451840431257%
Two or More Races Alone	61	16174403740017284%

Population by Sex	Number	Percent
Male	1,866	.4952215850422704%
Female	1,903	).5047784149577297%

Population by Age	Number	Percent
Age 0-4	274	7261622179272298%
Age 0-17	1,025	7204679728760717%
Age 18+	2,744	7279532027123928%
Age 65+	374	0991920170080062%

Households by Tenure	Number	Percent
Total	1,284	
Owner Occupied	1,035	8066031209572699%
Renter Occupied	248	9339687904272992%

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, Census 2010 Summary File 1.

Environmental Assessment Factors

Earthquakes

Figure 3.

National Seismic Hazard Map

Adapted from http://earthquake.usgs.gov/research/hazmaps/products_data/48_States/index.php