Historic American Engineering Record (HAER) of the Lake Placid Dam, Seguin, Guadalupe County, Texas

SEPTEMBER 2023

PREPARED FOR

Black & Veatch
Guadalupe-Blanco River Authority

PREPARED BY

SWCA Environmental Consultants

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HISTORIC AMERICAN ENGINEERING RECORD (HAER) OF THE LAKE PLACID DAM, SEGUIN, GUADALUPE COUNTY, TEXAS

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ABSTRACT

This report presents the Historic American Engineering Record (HAER) type documentation of the Guadalupe-Blanco River Authority's (GBRA) Texas Power Corporation Development Number 4 (Lake Placid Dam). This report was prepared by SWCA Environmental Consultants (SWCA) and was approved by the U.S. Army Corps of Engineers (USACE), GBRA, the project's sponsor, as well as the Texas Historical Commission (THC). This report includes all documentary materials formatted and submitted to the standards of the National Park Service (NPS) and the Library of Congress (LOC), but it was not sent to the NPS for inclusion in the Library of Congress' (LOC) HAER Collection. Minor formatting changes have been made to enable the reproduction and distribution of the complete documentation sections as a single report, rather than a series of sections, as it would be archived in the LOC.

Part I, the Historical Information section, describes the historical significance of the Lake Placid Dam as it was determined to be eligible for listing in the National Register of Historic Places (NRHP) for its influence on local community planning and development and for its engineering design qualities. The Historical Information section also describes Lake Placid Dam as it was designed, constructed, operated, and repaired over more than nine decades of service. GBRA owns, operates, and maintains the TP-4 Dam on Lake Placid near Seguin, Guadalupe County, Texas. Completed in 1932, the TP-4 Dam is a concrete spillway with earthen embankments. On October 14, 2021, spillgate Number 2 failed at the dam with no ability to impound water and maintain the normal pool elevation required for the hydroelectric generation. The TP-4 Dam requires significant upgrades to maintain functionality after this spillgate failure, and an U.S. Army Corps of Engineers permit is required for the upgrades to occur, trigging compliance with Section 106 of the NHPA. The project proposes to replace the existing gates, to add new armoring on the embankments, and to construct a new access walkway at the TP-4 Dam. The project will replace the two existing bear trap gates with two new hydraulically actuated steel crest gates, and the foundation will be modified to maintain the structural stability of the spillway and to spread the structural load of the new gates. The existing earthen dam embankments are armored partially with concrete; however, the current Texas Commission on Environmental Quality standards for dam safety require additional concrete armoring. Additionally, a new walkway will be installed above the spillway to provide more stable and safer access for visual inspection than the existing suspension bridge, which is no longer safe for use. Part II describes the dam's structural and design information. Part III is the sources of information used in this document, as well as resources not searched.

Appendix A contains a representative selection of original as-built engineering and architectural drawings dating from the system's original period of design and construction (1930 to 1932). The final section of this report includes seventeen large-format black-and-white photographs taken by Matthew Holtkamp, M.A. as a mitigation requirement for GBRA's proposed dam repairs.

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HISTORIC AMERICAN ENGINEERING RECORD

TEXAS POWER (TP)-4 DAM ON LAKE PLACID

Location:	The Lake Placid Dam is 2.45 miles southwest of Seguin, Texas, along the Guadalupe River, in Guadalupe County, Texas. The physical address of the TP-4 Lake Placid Dam is 19513 FM725, Seguin, Texas. The coordinate's datum is WGS 84. The dam is located at latitude 29.548502, longitude -97.999448. The coordinate represents the approximate center of the TP-4 spillway where it crosses the Guadalupe River. The coordinate was obtained on July 27, 2022, using decimal degrees accurate to +/- one meter.
Historic Owner/ Occupant:	Texas Hydro-Electric Corporation.
Present Owner/ Occupant:	Guadalupe-Blanco River Authority (GBRA), Seguin, Texas.
Historic Use:	One of six hydroelectric dams built along the Guadalupe River in 1930.
Present Use:	Still in use as a dam.
Significance:	The Texas Power Corporation's Development Number 4 (TP-4) was the fourth of six hydroelectric power production dams planned and constructed along the Guadalupe River between 1927 and 1932, most of which continue to operate as originally constructed. TP-4 was the last dam completed, in 1932. On October 14, 2021, spillgate Number 2 failed at the dam with no ability to impound water and maintain the normal pool elevation required for the hydroelectric generation. The TP-4 Dam requires significant upgrades to maintain functionality after this spillgate failure, and an U.S. Army Corps of Engineers permit is required for the upgrades to occur. The TP-4 Dam is representative of the system of dams constructed to create a hydroelectric power grid for the Guadalupe River Valley, and the bear trap gates are among the earliest examples of this spillgate mechanism in the state.
Historian(s):	This report was completed by Erin Edwards, M.P.S., Hannah Curry, M.S., and Ella McIntire, M.A. of SWCA Environmental Consultants, in Houston, Texas.
Project Information:	The project was instigated by the need for upgrades at the dam in order to continue functioning at optimal levels. On October 14, 2021, spillgate Number 2 failed at the dam with no ability to impound water and maintain the normal pool elevation required for the hydroelectric generation. The TP-4 Dam requires significant upgrades to maintain functionality after this spillgate failure. The project will replace the two existing bear trap gates with two new hydraulically actuated steel crest gates, and the foundation will be modified to maintain the structural stability of the spillway and to spread the structural load of the new gates. The existing earthen dam embankments are armored partially with concrete; however, the current Texas Commission on Environmental Quality standards for dam safety require additional concrete armoring. Additionally, a new walkway will be installed above the spillway to provide more stable and safer access for visual inspection than the existing suspension bridge, which is no longer safe for use. This historic documentation report was sponsored by the GBRA, in consultation with the United States Army Corps of Engineers, Fort Worth District (USACE-SWF) and the Texas State Historic Preservation Officer (SHPO), for purposes of mitigating adverse effects caused by the GBRA's proposed repair and improvement of Texas Power Corporation Development Number 4 (TP-4).

Planned and constructed by Texas Power Corporation from 1927 to 1928, TP-4 was recommended as eligible for NRHP listing for its influence on local community development (NRHP Criterion A). Following a partial failure of the dam's spillgate Number 2 in May 2021, the dam was reassessed and again recommended for NRHP listing under Criterion A as well as Criterion C for its engineering design qualities. When dam repairs became necessary in 2021, the USACE-SWF and the Texas SHPO concurred that TP-4 was eligible for NRHP listing at a local level of significance under both Criterion A and Criterion C.

Research methods employed for this HAER-type documentation project emphasized acquisition and analysis of reliable primary and secondary sources ranging from original as-built/record drawings and historical photos archived by the project owner, Guadalupe-Blanco River Authority, to technical hydropower dam design and documentation reports published by state and federal agencies. Historical context information was obtained from a variety of websites, including regional newspaper columns and the Texas Historical Commission's (THC) Historic Sites Atlas listings for similar hydropower dam sites.

Historic documentation services were provided by SWCA, working under contract with Black and Veatch Corporation. GBRA Executive Manager of Engineering, Charles Hickman, P.E., served as the project sponsor and provided access to GBRA's engineering drawing and photograph collections. Copies of this documentary report and its supplementary materials will be filed with the USACE-SWF and the THC. Additional copies of the report along with original drawings and photographs will be archived at GBRA Headquarters in Seguin, Texas.

Part I. Historical Information

A. Physical History

1. Date(s) of construction: Construction of the Lake Placid Dam began in 1930 and was completed in 1932.

2. Engineer: Fargo Engineering Company, a Michigan-based engineering firm specializing in water and steam power in the Midwest.[1]

3. Contractor: Unknown.

4. Ownership: Lake Placid Dam is one of six hydroelectric powerplants operated by GBRA on the Guadalupe River. The powerplants were authorized by the State Board of Water Engineers via two permits. Permit No. 21, dated July 25, 1914, authorized an appropriation not to exceed 1300 cubic feet per second (cfs) from the Guadalupe River for hydroelectric generation. Permit No. 21 was issued to the Guadalupe Water Power Company, which is now owned by the GBRA. Permit No. 1096, dated June 12, 1929, granted an appropriation that was not to exceed 941,200 acre-feet of water per annum. Permit No. 1096 was issued to the Hunt Development Company, which is also now owned by GBRA. GBRA purchased the Lake Placid Dam from Texas Power Corporation (TPC) in 1963.[2]

The state legislature created GBRA initially in 1933 as the Guadalupe River Authority, and then reorganized during the next session as GBRA (i.e., Guadalupe-Blanco River Authority). The intent was to provide an agency that would balance the public and private demands on water from the Guadalupe River and its tributaries. Currently, GBRA exists to protect and conserve the water resources of the Guadalupe River Basin across 10 counties, beginning at the headwaters of the Guadalupe and Blanco Rivers, and ending at San Antonio Bay.[3] The

[1] Williams and Coggin, *McQueeny, Texas: A Pictorial History*.

[2] "Power Dams Sites Sold for Million," *Victoria Advocate*, Monday, May 18, 1931, p. 4. Accessed via Newspapers.com.; "Texas Power Corporation to Guadalupe-Blanco River Authority Contract of Sale," Deed, April 1963.

[3] "About Us," Guadalupe-Blanco River Authority (blog), accessed March 29, 2022, https://www.gbra.org/about/.

GBRA's services include wastewater management, water supply, water treatment, watershed protection, water resource management, and hydroelectric generation (GBRA internal files).

5. Construction of the dam: Construction began in 1930, and hydroelectric power was first generated in March 1932. The dam is earth fill with a concrete core wall, bear trap gates, concrete spillway, and powerhouse. The dam measured 1,750 feet long, and 41 feet tall. The dam has a total capacity of 2,624 acre-feet and a surface area of 248 acres (GBRA internal files).

6. Spillway Gates: Fargo Engineering Company provided a bear trap gate design for their only Texas designs, specifically a gate patented by Huber & Lutz, engineers based in Zurich, Switzerland.[4] The Huber & Lutz design includes an additional piece on the upstream leaf attached at a right angle to create overlap with the downstream leaf when lowered (GBRA internal files).

7. Original Plans and Construction: All the drawings were produced by Fargo Engineering Company of Jackson, Michigan from 1925 – 1927 for the original project developer Texas Power Corporation with as built/record drawing updates also produced by Fargo Engineering Company from 1927 to 1932. Plans show traditionally massive earthen dam construction with distinctly modern reinforced concrete structural elements and an architecturally detailed powerhouse. A select group of those drawings are included as Figures 1 through 26 in Appendix A of this report, and others may be accessed at GBRA's engineering records archive.

8. Alterations and additions: The original manual dam controls inside the control house were upgraded to electronically actuated controls in the late 1990s to early 2000s, enabling remote operation and control of the spillgates. A new electric actuated valve and an instrument and control panel to monitor water levels and generation output were added to the interior of the powerhouse. Over the last 90 years the wooden timber facings of the spillgates required maintenance and eventual replacement due to damage caused by floating debris. The original timber facings were replaced with new timbers in the 1980s. The replacement timbers are bound together by tongue and groove joints and attached to the underlying metal trusses using 5/8" bolts, matching the original installation.

B. Historical Context

Seguin, Texas

Guadalupe County, Texas, comprises approximately 718 square miles of Central Texas northeast of the City of San Antonio and Southwest of the City of Austin. This area is known for its rivers and recreation, German Heritage, and the limestone-clad historic downtown square of Seguin. The county was formally organized in 1846, though efforts began before the annexation of Texas, and the county seat Seguin is known as one of the oldest cities in Texas.[5]

Guadalupe County is so named for its northern boundary: the Guadalupe River, from which the county derives its unique cultural identity. The Guadalupe River was named for her Lady Guadalupe—the Virgin Mary—by Spanish explorer Alonso de Leon in 1689, and the region was home to indigenous peoples, and subject to exploitation, trade, and exploration by Spanish, Mexican, and American parties throughout the seventeenth through nineteenth centuries.[6]

Archaeological evidence reveals continuous occupation of the area since the Archaic period.[7] At the time of European invasion and colonization, this region was home to Native American Tribes including the Karankawas, Tonkawas,

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[4] Bentley Historical Library, *Fargo Engineering Company records: 1897-1951 (Majority of material found within 1910-1930)* (Ann Arbor, Michigan: University of Michigan, 1995) https://quod.lib.umich.edu/b/bhlead/umich-bhl-9543?view=text

[5] John Gesick, "Seguin, TX," Texas State Historical Association: Handbook of Texas, accessed February 28, 2022, https://www.tshaonline.org/handbook/entries/seguin-tx.

[6] Gesick, "Seguin, TX."

[7] Gesick, "Seguin, TX."

Comanches, and Lipan Apaches, who utilized the resources of the river, and lived throughout central and south Texas.[8] Descendants of these groups still live in the areas surrounding the river, however, Native American removal substantially impacted the legacy of Native Americans along the Guadalupe River. Today, the various springs, lakes, and rivers hold distinct cultural and spiritual significance for federally protected Tribes throughout Texas and the United States.[9]

The first land grant in the area was a Spanish land grant in 1806.[10] Then, after Mexico won its independence from Spain, the Mexican government granted land to settlers throughout the area. Early settlement was short-lived due in part to conflict with Native Americans, but the area acutely experienced the upheaval of the Texas Revolution.

In the wake of the Revolution, much of the land in the area was granted to veterans of the Texas Revolution and Texas Rangers in the 1840s. These men were soon joined by German immigrants, American colonists, and enslaved Africans, and their militant protections over the area incentivized trade and settlement. Initially, the communities around the Guadalupe were sparse and decentralized, organized around river crossings, mills, and markets, however, the Texas Rangers who first returned to the area in 1838 to protect it from Mexican forces formed a settlement near the river. They first called their community Walnut Springs, but changed the name to Seguin, for Tejano military hero Juan N. Seguin, in 1839.[11]

The town of Seguin was incorporated in 1853 by charter, and it grew quickly due to its former military presence and proximity to the river for trade, agriculture, and industry. By 1860, Seguin had Presbyterian, Methodist, Episcopalian, Catholic, and Baptist churches, and in 1850, a schoolhouse was built. After the American Civil War, free people of color and their descendants formally established congregations and schools recognized by the state in Seguin.[12]

The city continued to grow in size and stature, and German immigrants continued to flow into the community through Galveston Bay.[13] German immigration was considered big-business, and German communities formed, consolidated, and moved throughout the state.[14] The German population is credited for advancing and organizing agriculture in Guadalupe County, and the arrival of the railroad enabled these goods to be disseminated efficiently. These two industries were significant factors for Seguin's success in the Antebellum South and set a precedent for prosperity.[15]

Hydroelectric Development at the Turn of the Century

The use of electricity to provide light and power to homes and businesses is a relatively recent development. Electric power got its start in New York in the 1880s. Thomas Edison invented the incandescent bulb in the 1870s and began to work with wealthy customers to install electric power (produced by small generators) in their homes. In 1882, with funding from J.P. Morgan, Edison opened the Pearl Street Station in lower Manhattan, the first centralized power plant composed of multiple generators that served numerous homes and customers by sending electricity over a grid of wires. The Pearl Street Station quickly became a model for industrial-scale power generation.[16]

The first hydroelectric power plant came into service in Appleton, Wisconsin, on September 30, 1882, and was powered by the Fox River. The plant was known as the Appleton Edison Light Company and was based on Edison's work in

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[8] "Native Land Digital," Native-Land.ca, accessed March 1, 2022, https://native-land.ca/; John Gesick, "Seguin, TX."

[9] "About – Art of the Sacred Texas Springs," accessed March 1, 2022, https://sacredtexassprings.com/about/; "Save Our Springs Alliance - Austin's Water Watchdog Since 1992," accessed March 1, 2022, https://www.sosalliance.org/; "TPWD: State of Springs," accessed March 1, 2022, http://www.texasthestateofwater.org/screening/html/water_mag_springs.htm.

[10] Gesick, "Seguin, TX."

[11] Gesick, "Seguin, TX."; Jesus De la Teja, "Seguin, Juan Nepomuceno," Texas State Historical Association: Handbook of Texas, accessed February 28, 2022, https://www.tshaonline.org/handbook/entries/seguin-juan-nepomuceno.

[12] Gesick, "Seguin, TX."

[13] Robert Polcheck, "German Texans," Texas Almanac, July 2020, https://www.texasalmanac.com/articles/german-texans.

[14] Lawrence H. Konecny and Clinton Machann, "German and Czech Immigration to Texas: The Bremen to Galveston Route, 1880- 1886," *Nebraska History* 74 (1993): 136–41; Terry G. Jordan, "The German Settlement of Texas after 1865," *The Southwestern Historical Quarterly* 73, no. 2 (1969): 193–212.

[15] Gesick, "Seguin, TX."

[16] "History of Electricity," IER (blog), accessed March 29, 2022, https://www.instituteforenergyresearch.org/history-electricity/.

creating an electrical grid in New York City. It produced just enough electricity to light the owner's home, a nearby building, and the plant itself.[17] Despite the low initial energy yield, the plant proved that hydroelectric power was a viable source of electricity.

When electric power first came into use in the 1880s, it offered a level of safety and convenience that the previously popular gas light could not match, and as a result, it quickly gained popularity in urban areas. The dense populations of cities made the installation of electric infrastructure economical; power lines could serve many customers per mile, decreasing the average installation cost per customer. As well, new electric companies quickly began to merge, eliminating the need for many smaller generating plants and enabling the consolidated companies to instead use larger, more efficient facilities.[18] Federal interests in water development also increased, and in 1902, the Bureau of Reclamation was established to provide water resource management in the United States, formalizing federal governance of water infrastructure.[19]

While hydroelectric power was developing exponentially elsewhere around the world, large hydropower plants in North America appeared in more notable locations around Grand Rapids, Michigan; Niagara Falls, New York; Ottawa, Ontario; and Dolgeville, New York.[20] In 1912, hydropower was the fastest growing source of electric generation in the United States. The start of World War I demanded more electrical power for manufacturing and national security, and by the end of the war, many huge steam and hydroelectric powerplants were built around the nation. The policies of the 1930s, such as President Roosevelt's New Deal, further propelled the development of multifaceted hydropower and flood control projects throughout the United States, such as the Hoover Dam.[21] However, until the Rural Electrification Act of 1936 was passed, only 10 percent of rural Americans had electricity, and hydroelectricity in rural communities was limited to mills and structures near the water.[22]

Rural Electrification Act and Hydroelectricity in Texas

Hydroelectric power was especially advantageous in the remote localities of the Western United States, where resources for power such as coal and timber were scarce or elsewise difficult to transport. Hydroelectricity on a smaller scale powered Westward expansion and served the communities along the railroads therein. The Rural Electrification Act of 1936 enabled the Federal Government to grant loans to states, public utilities, electrical cooperatives, and municipalities, to build power lines to farms and ranches, which was particularly important in Central Texas, where railroad expansion increased rural development and increased agricultural demands required more sophisticated and large-scale irrigation.

While waterpower has never been a reliable source of industrial electric power in Texas on a large-scale, throughout the nineteenth and twentieth centuries, the everchanging currents of the Texas rivers were harnessed for the benefit of local communities. Many of these small scale-dams in Texas began as earthen and limestone embankments that occurred naturally along the riverbed, and improvements enabled these dams to hold more water and to power mills, gins, water wheels, and small-scale electric plants through primitive copper wiring. Small-scale dams appeared along the Colorado and Brazos Rivers as early as 1820. In Guadalupe County, the Saffold Dam on the Guadalupe River near the town of Seguin began as a natural dam, which was then improved by Henry Troell in the late 1800s to power a cotton gin. The City of Seguin bought the Saffold Dam in 1907, as a part of a concerted effort to maximize the hydroelectric generating capacity of the Guadalupe River to serve the growing population of Seguin in the shadow of oil development.[23]

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[17] "The World's First Hydroelectric Power Plant Began Operation," accessed March 29, 2022, https://www.americaslibrary.gov/jb/gilded/jb_gilded_hydro_2.html.

[18] "History of Electricity," IER (blog), accessed March 29, 2022, https://www.instituteforenergyresearch.org/history-electricity/.

[19] Bureau of Reclamation, "History," accessed March 29, 2022, https://www.usbr.gov/history/borhist.html.

[20] "A Brief History of Hydropower," International Hydropower Association, accessed March 28, 2022, https://www.hydropower.org/iha/discover-history-of-hydropower.

[21] U.S. National Park Service, "6. Hydroelectric Power and the Bureau of Reclamation," accessed March 28, 2022, https://www.nps.gov/articles/6-hydroelectric-power-and-the-bureau-of-reclamation.htm.

[22] U.S. National Park Service, "7. Hydroelectric Power in the 20th Century and Beyond," accessed March 28, 2022, https://www.nps.gov/articles/7-hydroelectric-power-in-the-20th-century-and-beyond.htm.

[23] "Saffold Dam," Texas Historical Markers, accessed March 28, 2022, https://texashistoricalmarkers.weebly.com/saffold-dam.html; Linda Williams and Bruce Coggin, *McQueeney, Texas: A Pictorial History* (Virginia Beach, VA: The Donning Company Publishers, 2011).

The effort to increase hydroelectric power on the reliable Guadalupe River was led by the Guadalupe Water Power Company (GWPC). Beginning in 1912, the GWPC sought to construct a series of dams along the river, and in 1914, the State Board of Water Engineers: Permit No. 21 authorized the GWPC to build six powerplants along the river.[24]. However, priorities shifted during World War I and the company disbanded. Julius M. Abbott, son of Guadalupe County settlers and significant businessman in Guadalupe County society, reorganized the company as the Texas Power Company (TPC).[25] Under Abbott, the TPC built on existing efforts to create retention dams on the Guadalupe River, taking over the same Permit No. 21. TPC constructed six powerplants that are now operated by GBRA, and they are Dunlap (TP-1), McQueeney (TP-3), Placid (TP-4), Nolte (TP-5), H-4 Dam, and H-5 Dam.[26]

TP-4 Dam

The State Board of Water Engineers authorized the construction of the TP-4 Dam in 1929, as part of Permit No. 21 and No. 1096, which allowed the Hunt Development Company to appropriate 995,000 acre-feet of water annually for hydroelectric generation. It was part of the six-dam system along the Guadalupe River.[27] Both permits authorized their respective companies to construct six dams along the Guadalupe River for the purposes of generating hydroelectric power, however, financial difficulties stymied GWPC's ability to follow through on construction.[28]

Hunt Development Company was chartered in Delaware, and their lawyer, State Senator Alvin Jacob Wirtz, filed their permit application on September 10, 1928.[29] A hearing about the permit occurred on November 27, 1928, and numerous farmers attended to share their objections. Despite their protests, the State authorized the permit that same day. Although Wirtz's position in the state legislature likely helped the permit along, Wirtz also secured the financial backing needed for construction. With $2 million secured for construction and a deal with the Comal Power Company to distribute the generated power, construction on the first dam began in 1927.[30]

Construction on the TP-4 Dam began in 1930, and it began generating power in March 1932.[31] Papers also reported that it was the last completed structure of the six authorized under their permits, completing work years before the 1936 Rural Electrification Act provided the federal funding to offset the costs. [32] The TP-4 Dam was designed by Fargo Engineering Company in Jackson, Michigan using a bear trap gate design that works with manual or hydraulic mechanisms rather than electrical ones, and the TPC dam system represent the company's only designs in Texas.[33] The specific design used on the TP-4 Dam was patented by Huber & Lutz, engineers based in Zurich, Switzerland, and includes an additional piece on the upstream leaf attached at a right angle to create overlap with the downstream leaf when lowered

Bear trap spillgates were originally patented in the early nineteenth century by Josiah White in Pennsylvania. They gained popularity throughout the century and are best documented on dams along the Ohio River. When the design moved across the Atlantic to Europe, European engineers modified the design to change how the leaves of each gate interlock and support each other and called it a roof gate. The Huber & Lutz design used at the TP-4 Dam, as well as the H-4 and H-5

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[24] F.A. Godfrey and C.L. Dowell, "Texas Water Development Board: Major Hydroelectric Powerplants in Texas Historical and Descriptive Information," August 1968.

[25] Williams and Coggin, *McQueeney, Texas: A Pictorial History*.

[26] Texas Historical Association, "Water Power," Texas State Historical Association: Handbook of Texas, accessed March 29, 2022, https://www.tshaonline.org/handbook/entries/water-power;

[27] F.A Godfrey and C.L. Dowell, "Major Hydroelectric Powerplants in Texas: Historical and Descriptive Information." Texas Water Development Board, Report 81. August 1968, p. 44.

[28] "Night Session of Senate." *Austin American Statesman*. Saturday, March 1, 1913, page 2. Accessed via Newspapers.com; "Water Appropriation Permit Granted." *Fort Worth Record-Telegram.* Wednesday, November 28, 1928, page 4. Accessed via Newspapers.com.

[29] "Water Hearing Set." *The Austin American.* Tuesday, September 11, 1928, page 10. Accessed via Newspapers.com.

[30] Baer Engineering and Environmental Consulting, Inc. "Texas Power Corporation Development Number 1," HAER TX-3405, Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, November 2021, p. 7.

[31] Godfrey and Dowell, p. 44.

[32] "Austin Men Visit Guadalupe Dams." *The Austin American,* Wednesday, November 25, 1931, p. 2. Accessed via Newspapers.com.

[33] "Austin Men Visit Guadalupe Dams." *The Austin American,* Wednesday, November 25, 1931, p. 2. Accessed via Newspapers.com.; Bentley Historical Library, *Fargo Engineering Company records: 1897-1951 (Majority of material found within 1910-1930)* (Ann Arbor, Michigan: University of Michigan, 1995) https://quod.lib.umich.edu/b/bhlead/umich-bhl-9543?view=text

Dams, included a "roof ridge" installed at a right angle on the gate's upstream leaf. Although bear trap gates and roof gates differ slightly in design, engineers often use the terms interchangeably.[34] In 1964, documentation sponsored by the Texas Water Commission showed that the dams at Marble Falls Lake and Possum Kingdom Reservoir were the only other known dams with bear trap gates in Texas outside the Guadalupe River dam system.[35] The gates on the dam at Possum Kingdom Reservoir since have been replaced.[36]

Hunt Development Company sold the dams to a subdivision of TPC in 1931, and GBRA purchased the dams from TPC in 1963.[37] The state legislature created GBRA initially in 1933 as the Guadalupe River Authority, and then reorganized during the next session as GBRA (i.e., Guadalupe-Blanco River Authority). The intent was to provide an agency that would balance the public and private demands on water from the Guadalupe River and its tributaries. Currently, GBRA exists to protect and conserve the water resources of the Guadalupe River Basin across 10 counties, beginning at the headwaters of the Guadalupe and Blanco Rivers, and ending at San Antonio Bay.[38] The GBRA's services include wastewater management, water treatment, water supply, water resource management, watershed protection, and hydroelectric generation.

Development on Lake Placid

The waterway near the TP-4 Dam, also known as Lake Placid, has long been settled and developed by area residents. U.S. Geological Survey topographic maps show low density development along this section of the Guadalupe River in 1911, 1919, 1924, and 1930, the oldest topographic maps showing individual settlements for the area.[39] Aerial imagery for the area demonstrates that development density increased following the construction of the TP-4 Dam as water recreation activities grew in popularity.[40] A review of public appraisal district property records for parcels adjacent to Lake Placid also demonstrates that property owners are a mixture of year-round and seasonal occupants.

Part II. Structural/Design Information

A. General Statement

1. Character: Originally designed by Fargo Engineering Company of Jackson, Michigan for the Texas Power Corporation, TP-4 is one of six similar hydroelectric dams constructed along the lower Guadalupe River between 1927 and 1932. Incorporating a combination of traditionally robust earthen dam construction with distinctly refined, modern reinforced concrete structural elements, the character of TP-4 is that of a modern hybrid design that reflected evolving national trends in hydropower dam design in the early twentieth century period. The TP-4 Dam, as well as its sisters, provided valuable electricity to Seguin and the surrounding areas years before the 1936 Rural Electrification Act became federal law, putting Seguin and Guadalupe County ahead of many of its peers. The privately funded project represents the commitment Seguin's community leaders had towards the area's growth and demonstrates a successful rural electrification project before federal law provided funding. The TP-4 Dam, and the others constructed by TPC on the Guadalupe River, are the only projects designed by Fargo Engineering Company in Texas. The bear trap gates used on the TP-4 Dam are atypical in Texas, where the most

[34] Ryszard Daniel and Tim Paulus, *Lock Gates and Other Closures in Hydraulic Projects*, Cambridge, MA: Butterworth-Heinemann, 2019, p. 218-223.

[35] C.L. Dowell, "Bulletin 6408: Dams and Reservoirs in Texas, Historical and Descriptive Information." Texas Water Commission, July 1964.

[36] S.S. Vaghti, M. McClendon, and G.S. Lund, "Concrete assessment and service life extension planning for Morris Sheppard Dam." *Sustainable and Safe Dams Around the World: Proceedings of the ICOLD 2019 Symposium*, Jean-Pierre Tournier, Tony Bennett, Johanne Bibeau, ed. New York: CRC Press 2019, pg. 665.

[37] "Power Dams Sites Sold for Million," *Victoria Advocate*, Monday, May 18, 1931, p. 4. Accessed via Newspapers.com.; "Texas Power Corporation to Guadalupe-Blanco River Authority Contract of Sale," Deed, April 1963.

[38] "About Us," Guadalupe-Blanco River Authority (blog), accessed March 29, 2022, https://www.gbra.org/about/.

[39] U.S. Geological Survey Seguin, Texas quadrangle. Accessed via https://ngmdb.usgs.gov/topoview/viewer/.

[40] "Historic Aerials." Nationwide Environmental Title Research, LLC. Accessed March 20, 2022. https://www.historicaerials.com/viewer.

common gate designs are radial, vertical lift, and hinged crest.[41] The bear trap type gates are most common in Texas on the dams along the Guadalupe River, and only one dam in the state beyond this set continues to rely on bear trap gates. The TP-4 Dam has significance due to being one of the few surviving examples of bear trap gates in Texas.

2. Condition of fabric: The condition of the fabric is in generally good condition, and the dam structure has had only minimal alterations; a new electric actuated valve and an instrument and control panel to monitor water levels and generation output. Two of the bear trap gates are damaged from floating debris and need to be replaced.

B. Description

This asymmetrical hydroelectric dam structure lies roughly on the north-south axis where it spans the Guadalupe River, near Seguin, Texas, and it includes five primary elements: the embankments, spillway, substation, suspension bridge, and powerhouse.

1. Embankments. The embankments are asymmetrical, stretching approximately 1,250 feet on the north and approximately 190 feet on the south. The embankments have steel sheet pilings, laminated wood core walls, and earthen walls to protect the structure beneath. Concrete armoring was installed over the portions of the embankments closest to the retaining walls as part of the original design to prevent erosion, add structural stability, and reinforce the river's channelization.

2. Spillway. The spillway has two bear trap gates, also called roof gates, separated by an intermediate pier. Each bear trap gate has two overlapping leaves, one upstream and one downstream, to manage water flow. The gates are made with wood planks, and they originally relied on hydraulic adjustment of flows to operate and adjust the gate position. The gates are currently in a lowered position after gate Number 2 failed during an October 2021 flood event. The intermediate pier is solid concrete, utilizing concrete fill inside board-formed concrete finish.

3. Substation. The substation is attached to the powerhouse on the south, and it includes one set of three conductors, commonly called a bus, connected to a set of three platform transformers. The substation connects on the south to a two-pole wooden transmission line before moving underground for connection to the larger electrical system. The substation sits on a concrete slab foundation and is surrounded by a chain link fence with barbed wire across the top to protect the equipment.

4. Powerhouse. The powerhouse is a structural masonry building on the south side of the river. The L-plan powerhouse is a three-story building with a flat roof, crenellated parapet, original concrete coping covered with non-original metal, brick walls on levels two and three, wood-formed concrete walls on level one, and a concrete pier and beam foundation. The L-plan is dominated by the three-story rectangular ascender, and the foot is a one-story section on the west elevation. Typical windows are narrow steel-frame multi-light windows spanning levels two and three, and each window has two 2/2 sections of operable awning windows, one at each level as well as a plain steel spandrel near the top. Typical windows also have soldier course spandrels beneath and contrasting brick casing around the window and spandrel.

The south façade has a single opening, off-center towards the west. The opening contains one set of paired steel doors with a corresponding transom and casing to match the typical windows. The doors have a single panel in the lower half and a 3x3 grid of lights with a metal grate in the upper half, and the metal transom is a 2x6 multilight grid.

The north elevation mirrors the south so that the doorways align, however, the north elevation doorway contains a single door with sidelights to fill the same size casing. Additionally, half the transom has been removed and

[41] "Design and Construction Guidelines for Dams in Texas." Dam Safety Program, Texas Commission on Environmental Quality. RG-473, August 2009, accessed April 2022, https://www.tceq.texas.gov/downloads/publications/rg/rg-473.pdf.

infilled with a new interior duct to help relieve pressure on the mechanical equipment on level one. There is also a sign reading GBRA on the exterior, and the north elevation of the L-plan foot is visible. The L-plan foot has a single window on the north elevation, and it is a steel 3x3 multi-light opening with a 2x3 awning sash with the same casing as other openings.

The east elevation has three regularly spaced typical windows. The west elevation has two typical windows that mirror the east elevation on the south. The one-story foot on the west has a single, steel door with a panel in the lower half and a 3x3 grid of lights in the upper half, and there is a steel screen door on the interior. The one-story foot also has a window on its south elevation, and it is steel 3x3 multi-light opening with a 2x3 awning sash with the same casing as other openings.

Level one of the powerhouse has an no interior walls on the east or west, and it shelters the turbine for the hydroelectric generator. It is accessible via a concrete stair on the west side of the south embankment. The board-formed concrete used to construct level one remains in fair condition.

On the interior, the powerhouse has a painted wood plank ceiling, two-tone painted walls, and painted poured concrete floors. There is a non-operational restroom in the northeast corner enclosed by a partial-height brick wall with a concrete ceiling, and all other space is used for generation equipment. The generator sits below the floor plate for level two. The vertical generator is a 2,400 kw, 3 phase, 60 cycle, 2,300 volt, 180 rpm unit with a direct connected exciter. The generator and control equipment were produced by the General Electric Company. The turbine is installed in an open wheel pit, equipped with trash racks and headgates. The turbine was constructed by S. Morgan Smith, does 180 rpm, with a Kaplan propellor type, with a capacity of 3,750 hp at 29.0-foot head and is controlled by a Woodward governor. Most of the equipment is original to the powerhouse, such as the hoist system. Other equipment has been installed over time, such as an electric actuated valve and an instrument and control panel to monitor the water levels and generation output associated with the TP-4 Dam.

5. Suspension Bridge. The suspension bridge is a steel cable walkway that attaches to the powerhouse on the south and to a steel truss tower on the north. The suspension bridge aided in inspecting the spillgates and identifying missing or broken wooden planks, however, it is no longer in use due to safety concerns.

C. Mechanicals/Operation

TP-4 was constructed as a run-of-river plant that depended on flows in the Guadalupe River that are highly variable, ranging from twenty-eight cubic feet per second (cfs) to well over 46,300 cfs with a median and average flow of 395 cfs and 613 cfs, respectively. On June 16, 1964, storage of water began in Canyon Reservoir near New Braunfels, Texas. After that date, the flow of the river was partly regulated by releases from Canyon Reservoir, which has a discharge capacity of approximately 5,000 cfs. During large flood events, rainfall on the intervening watershed areas downstream of Canyon Lake Dam can contribute a significant portion of the river flow[42].

The roof-weir "bear trap" spillgates at TP-4, like each of the six Guadalupe Valley Hydroelectric System (GVHS) dams downstream from Canyon Reservoir, provide primary control of headwater levels in its corresponding reservoir (Lake Placid). This head is used to provide controlled water flow via a bypass canal to the TP-4 powerhouse located on the south bank of the Guadalupe River, where the water level is again controlled by headgates before it enters the powerhouse wheelpit to turn the single turbine and produce electricity.

During normal operation, TP-4, like each of the six GVHS hydropower facilities, is operated to pass all river flow through the turbines while maintaining the reservoir at its full-pond level to maximize operating head without overflowing the spillgates. When the river flow exceeds the flow capacity through the TP-4 powerhouse, or when the powerhouse is not generating, GBRA will spill the flow over the spillgates. During low river conditions when river flow is not adequate to

[42] Curry, Hannah and Ella McIntire, *Historic Resources Survey of the Lake McQueeney Spillgate Replacement and Dam Armoring Project, Seguin, Guadalupe County, Texas*. Prepared for Black & Veatch and the Guadalupe-Blanco River Authority, April 2022.

operate the TP-4 powerhouse turbine, GBRA shuts the powerhouse down and passes the river flow over the TP-4 spillgates. The total flow capacity through the TP-4 powerhouse at the normal operating level is about 1,300 cfs[43].

When a flood event occurs, the water level at the TP-4 dam will start to rise and spill over the spillgates. When the water level reaches the spill-point level, GBRA will manually start adjusting the TP-4 spillgate positions in an attempt to keep the water in Lake Placid at a specified spill-to-hold level from 0.2' to 0.6' below the spill-point level. Due to the highly variable nature of flooding on the Guadalupe River there is currently no set operational plan for relating changes in water level to gate position. The historic design of the bear trap spillgates makes it very difficult to maintain a desired gate position. Consequently, gate adjustments are made by trial-and-error experience of the GBRA dam operators. GBRA personnel monitor upstream weather conditions and flow releases to help anticipate expected inflows. During spill events, the dams must be staffed twenty-four hours a day to continuously monitor water levels and adjust spillgate positions.

D. Site Information

The Lake Placid Dam is 2.45 miles southwest of Seguin, Texas, along the Guadalupe River, in Guadalupe County, Texas. The physical address of the TP-4 Lake Placid Dam is 19513 FM725, Seguin, Texas. When viewed from ground level, the TP-4 dam and spillway is an impressive structure set among mature native trees with the main spillway and south (right) embankment rising to an elevation equal to that of the adjacent riverbank. In contrast, the north (left) bank of the Guadalupe River is substantially lower in elevation, with the TP-4 spillway and its right (north) embankment overlooking the natural river channel below. This asymmetrical hydroelectric dam structure includes five primary elements: the embankments, spillway, substation, suspension bridge, and powerhouse. From the TP-4 spillway to the TP-4 powerhouse, the overall TP-4 hydropower complex exhibits a distinctive integration of engineering design within a natural riverine landscape that has characterized TP-4 and its related GVHS run-of-the-river hydropower plants for more than ninety years.

Part III. Sources of Information

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[43] Ibid

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C. Likely Sources Not Yet Investigated

None known.

APPENDIX A
REDUCED COPIES OF MEASURED AND INTERPRETIVE DRAWINGS

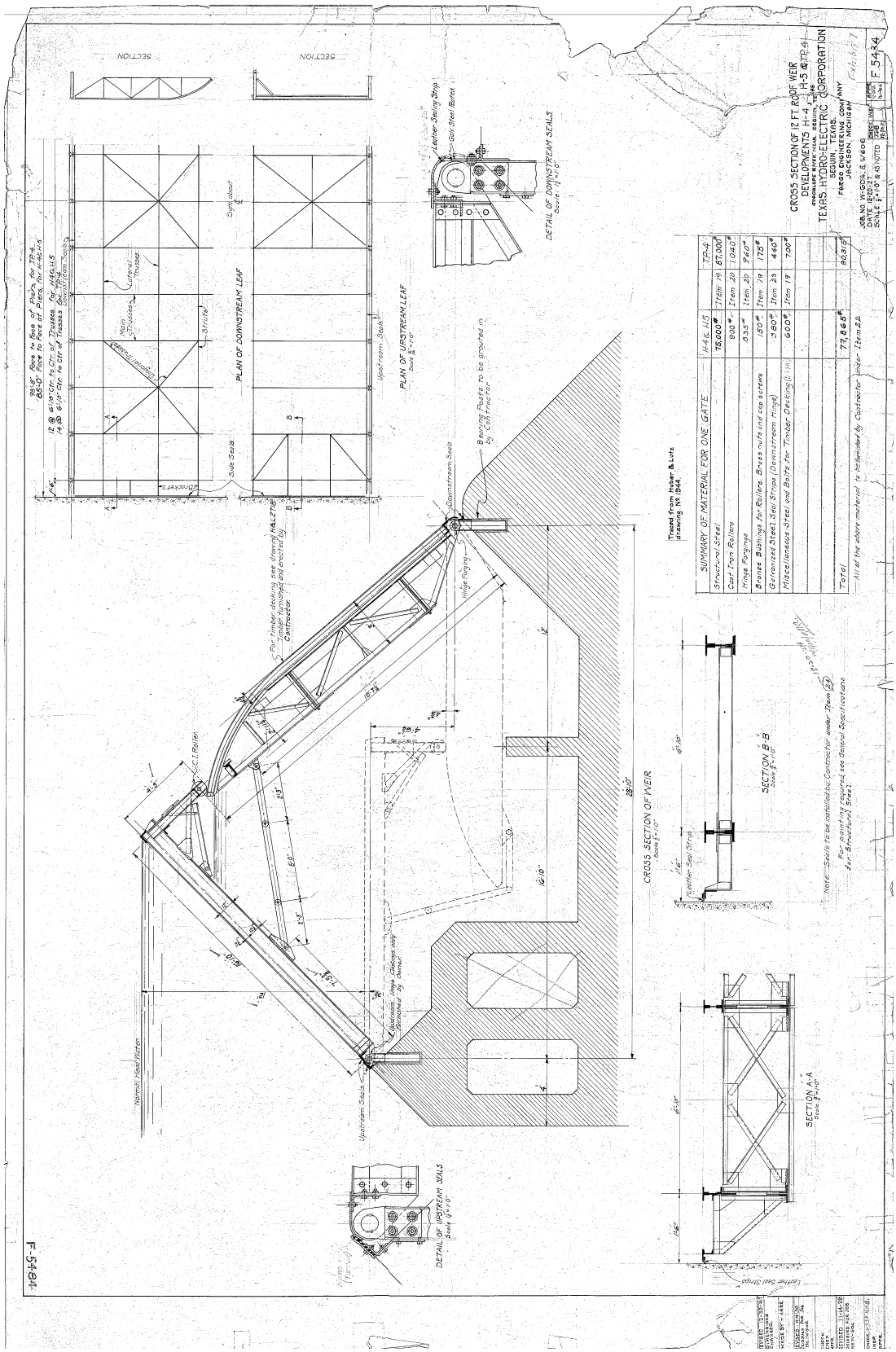


Figure 1. #F5484.Cross Section of 12 Ft. Roof Weir Developments H-4, H-5, TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, dated 12/20/1927.

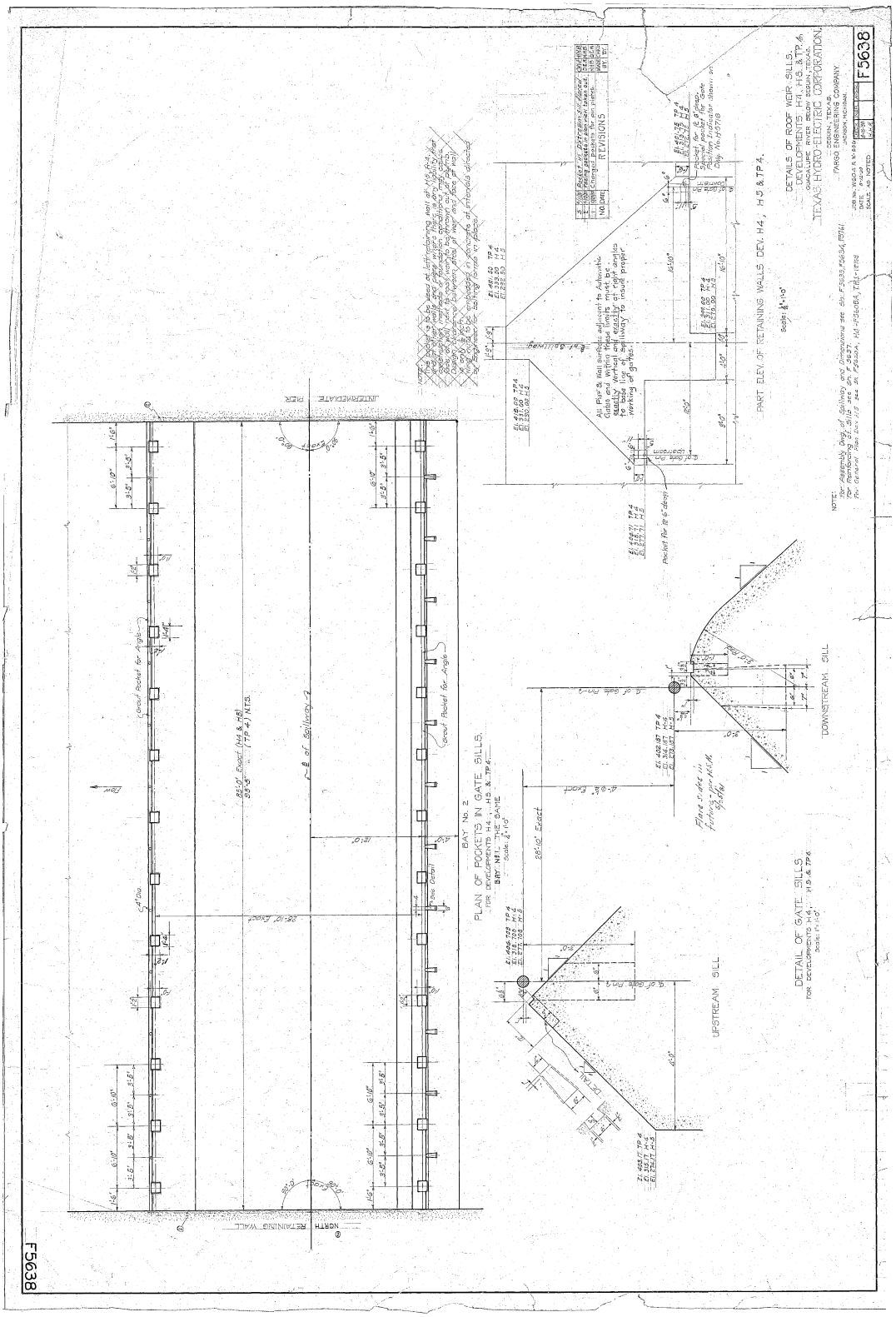


Figure 2. #F5638. Details of Roof Weir Sills, Developments H4, H5, TP-4, Guadalupe River Below Seguin, Texas, Texas Hydro-Electric Corporation, Seguin, Texas, Drawn by Fargo Engineering Company, Jackson, Michigan, dated 08/12/1930.

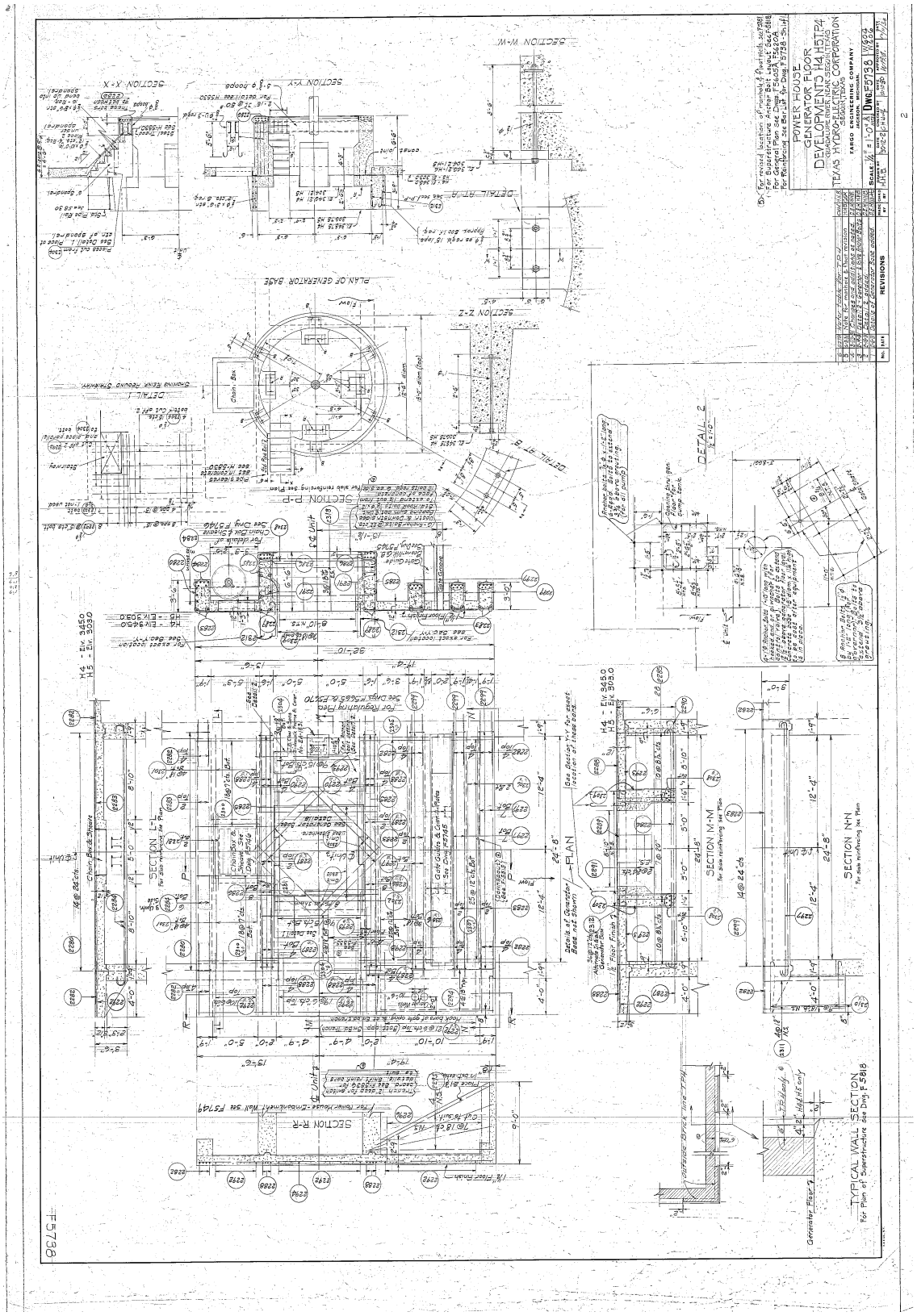


Figure 3. #F5738. Power House Generator Floor, Developments H4, H5, TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, dated 12/02/1930.

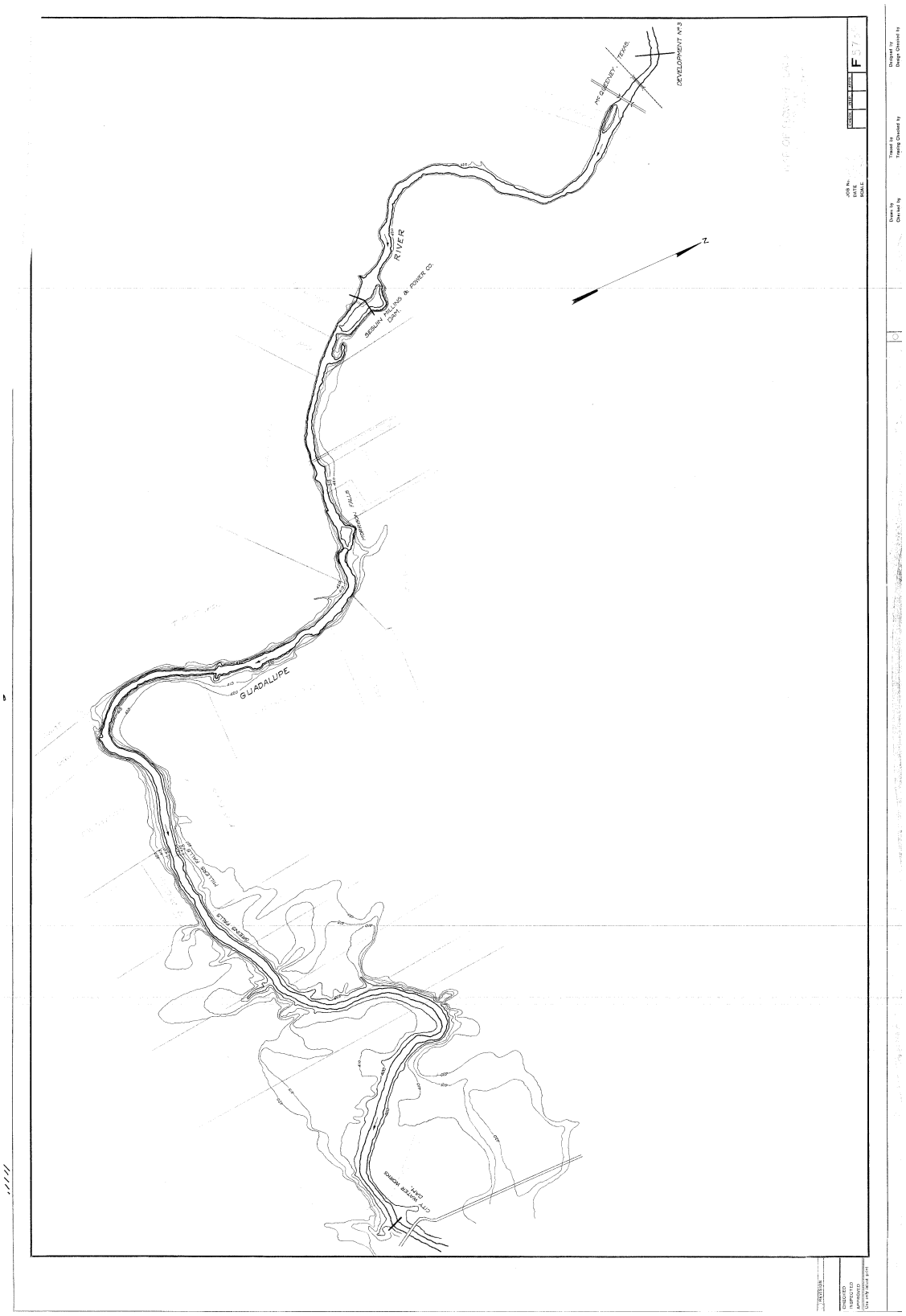


Figure 4. F5739. Map of Flowage Land AboveTP-4 Development. Texas Hydro-Electric Corporation, Seguin, Texas, Drawn by Fargo Engineering Company, Jackson, Michigan, dated 05/21/1930.

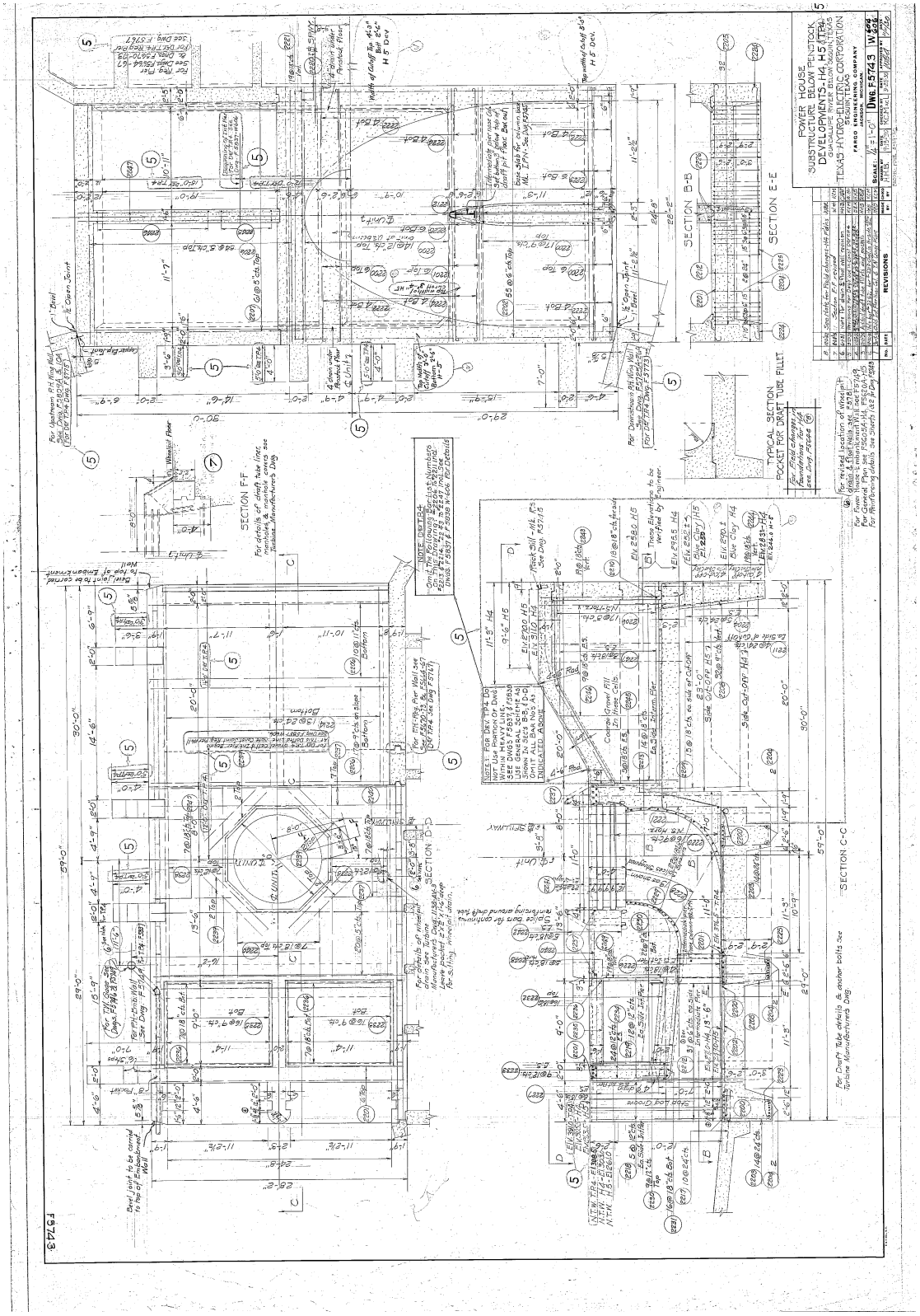


Figure 5. F5743. Power House Substructure Below Penstock, Developments H4, H5, TP-4, Guadalupe River Below Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas, Drawn by Fargo Engineering Company, Jackson, Michigan, dated 09/18/1930.

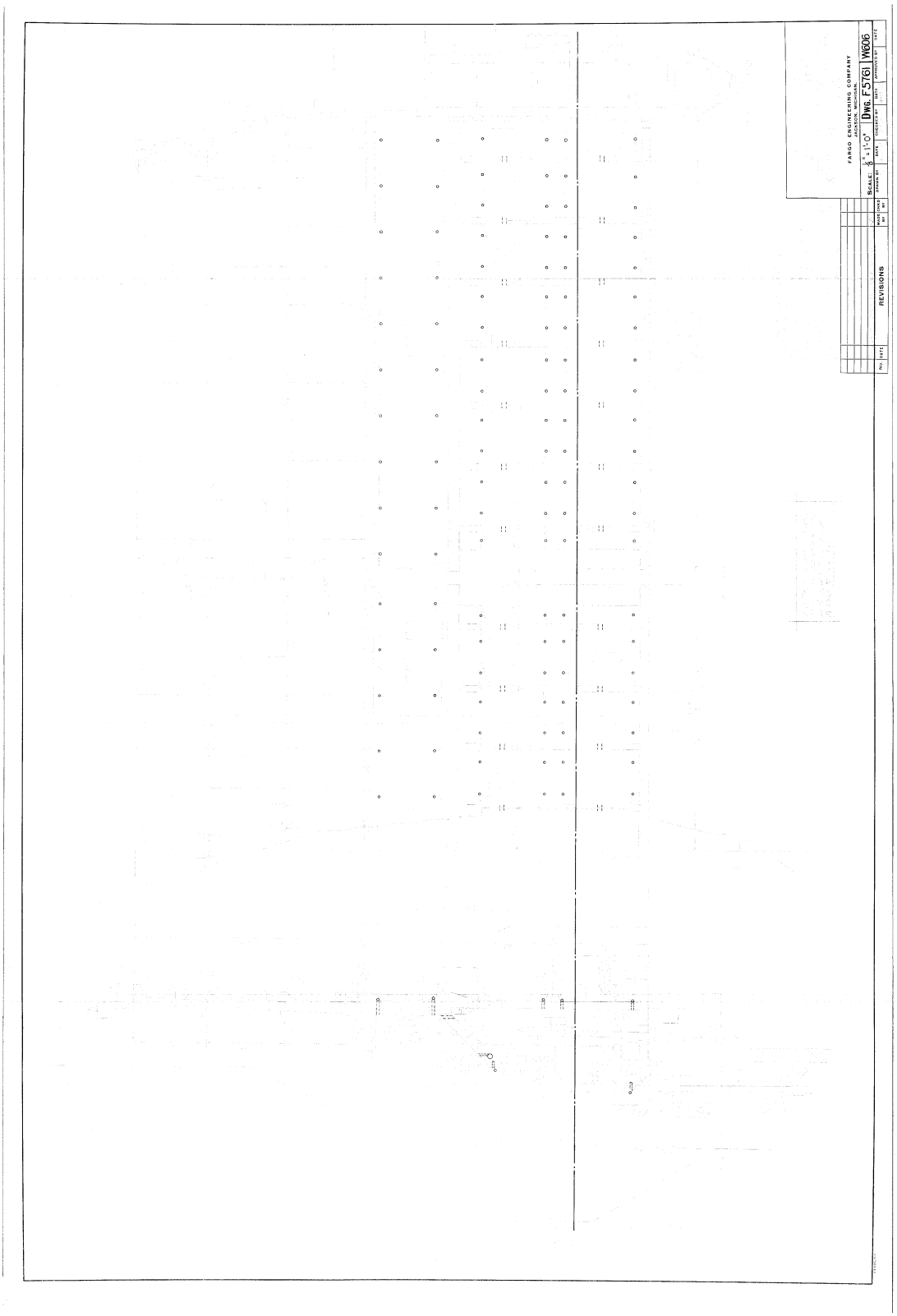


Figure 6. F5761. Spillway Assembly. Development TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 04/06/31.

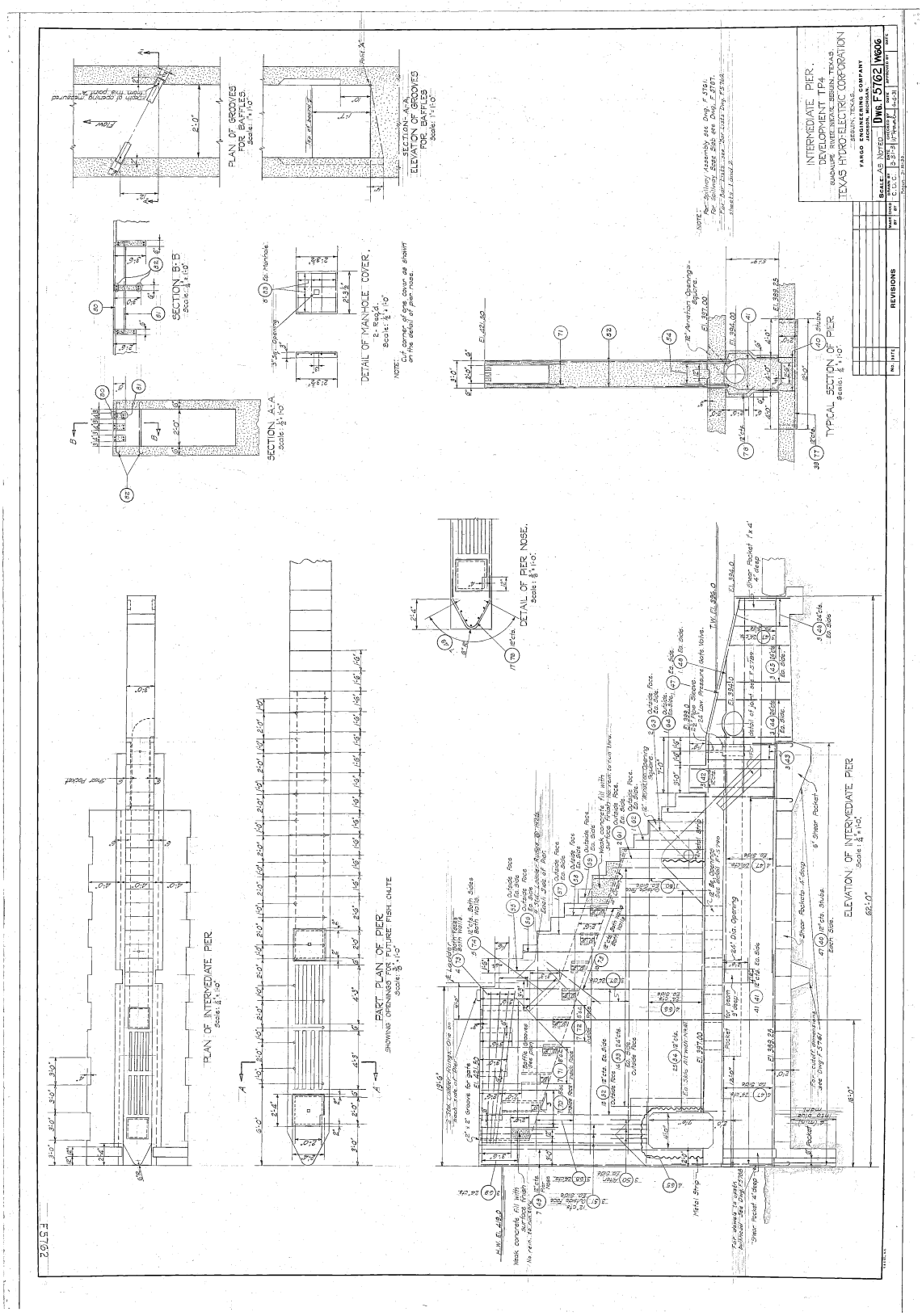


Figure 7. F5762. Intermediate Pier Development TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/31/1931.

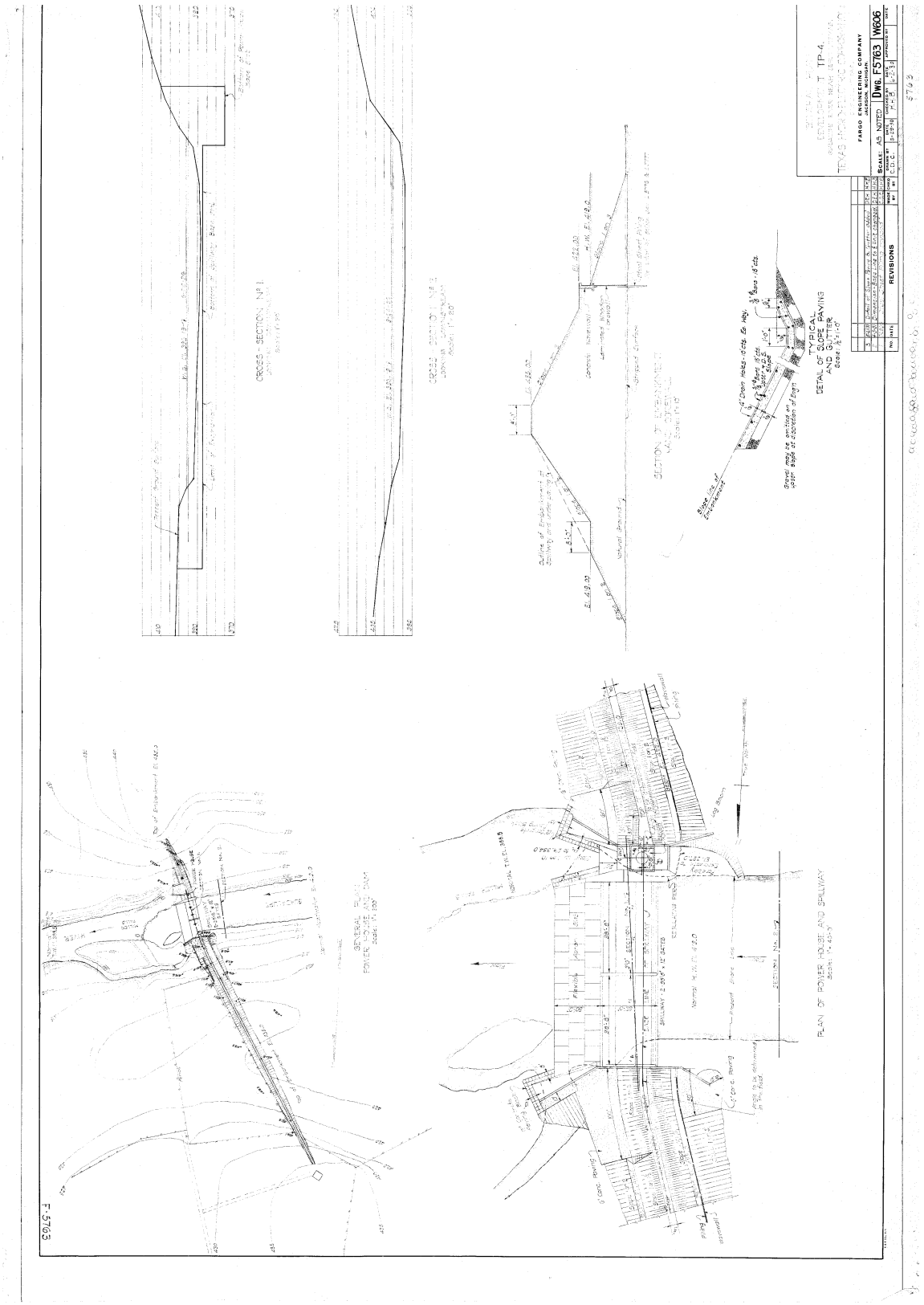


Figure 8. F5763. General Plan Development TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 05/29/1931.

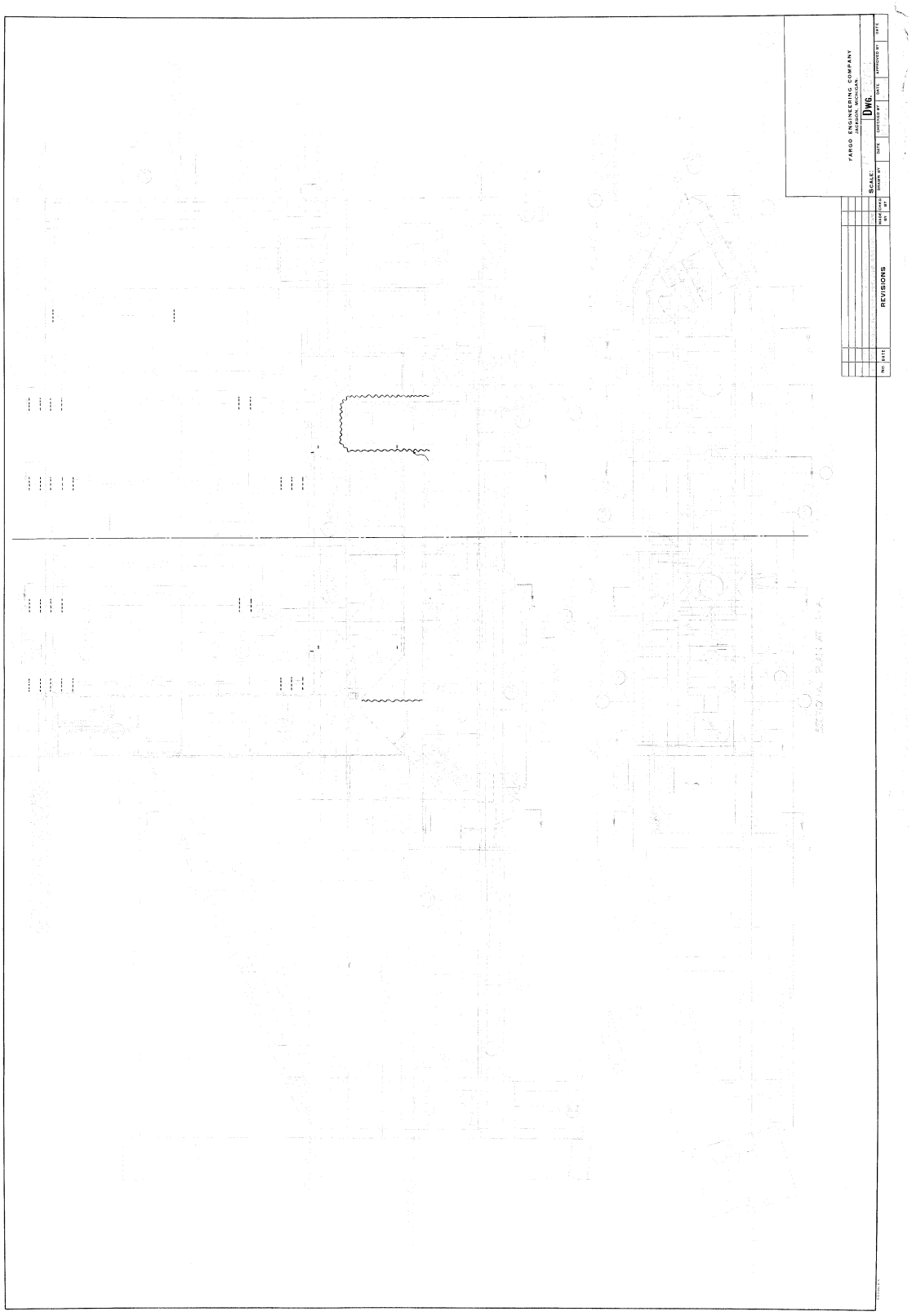


Figure 9. F5764. Regulating Pier Development TP-4. Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/31/1930.

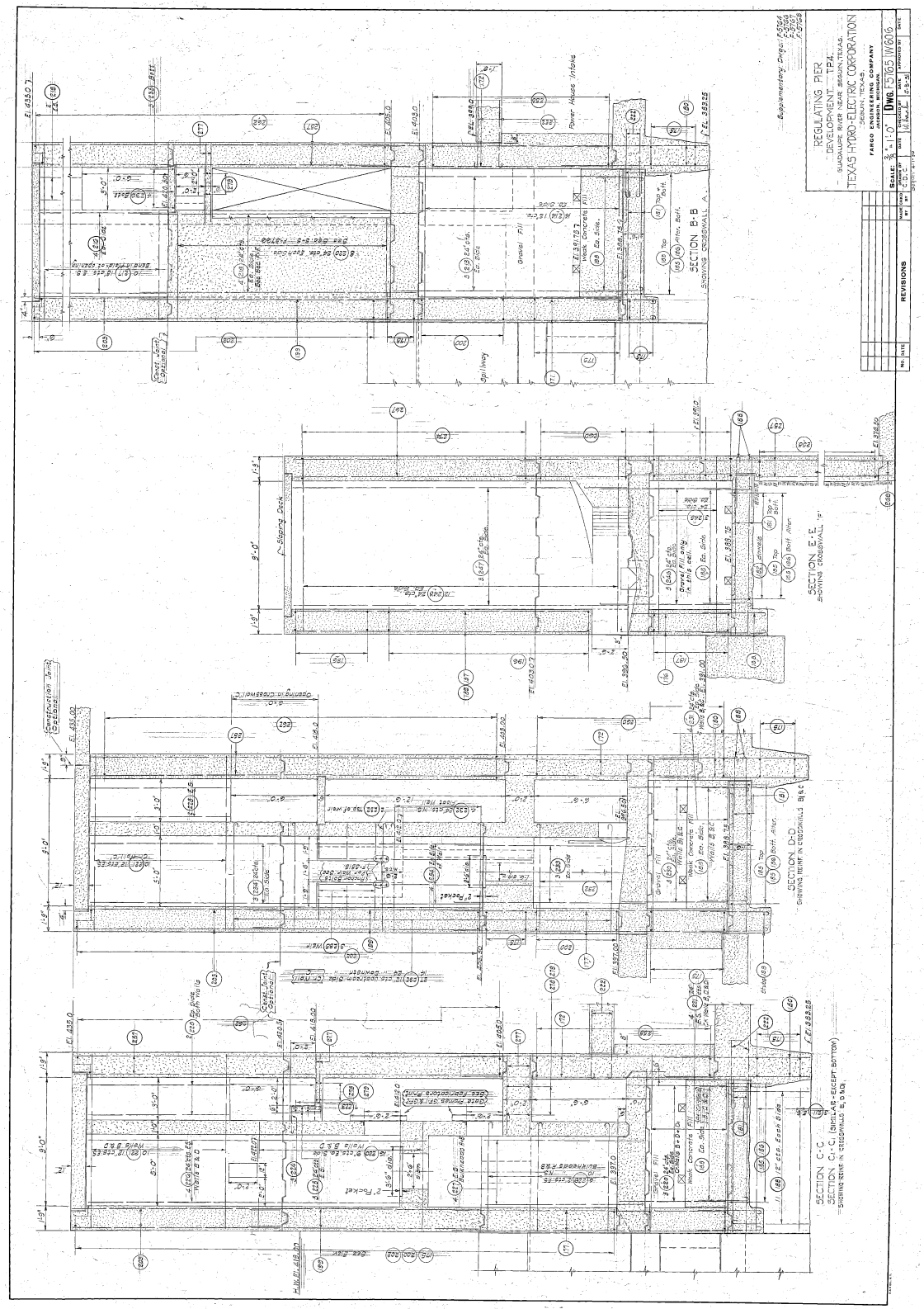


Figure 10. F5765. Regulating Pier Development TP-4. Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 05/03/1931.

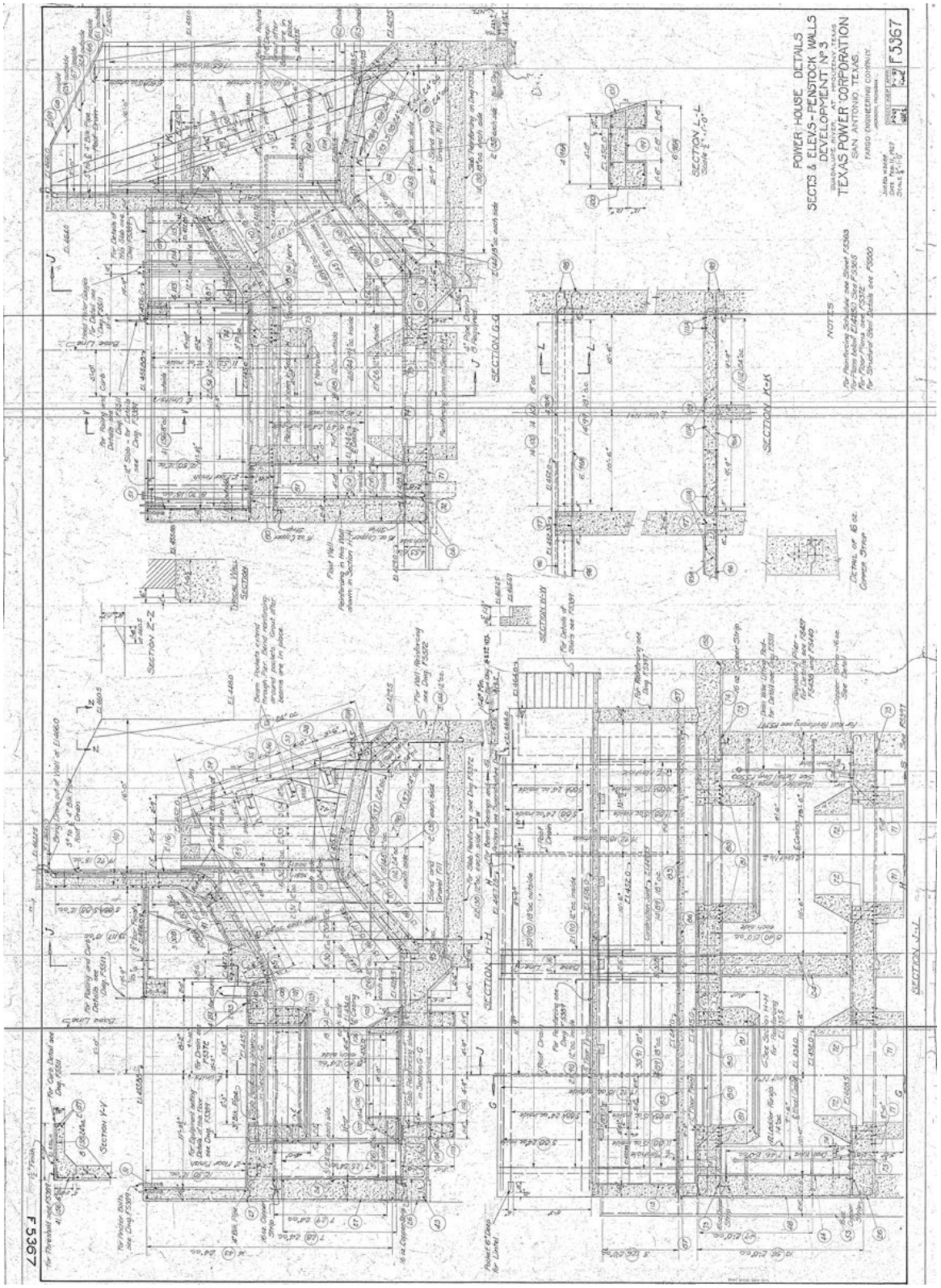


Figure 11. F5766. Regulating Pier Development TP-4. Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 05/03/1931.

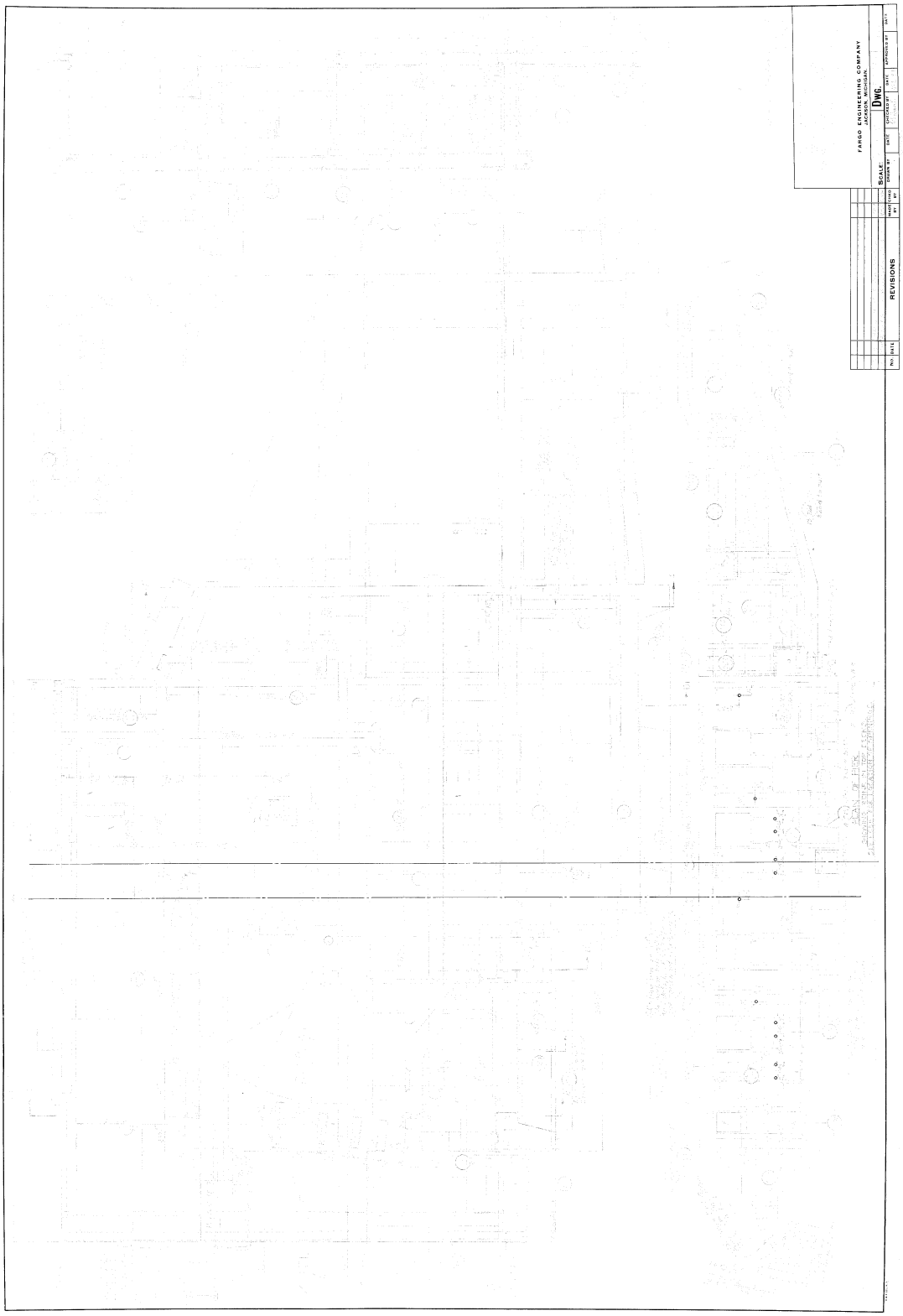


Figure 12. F5767. Regulating Pier Development TP-4. Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/07/1930.

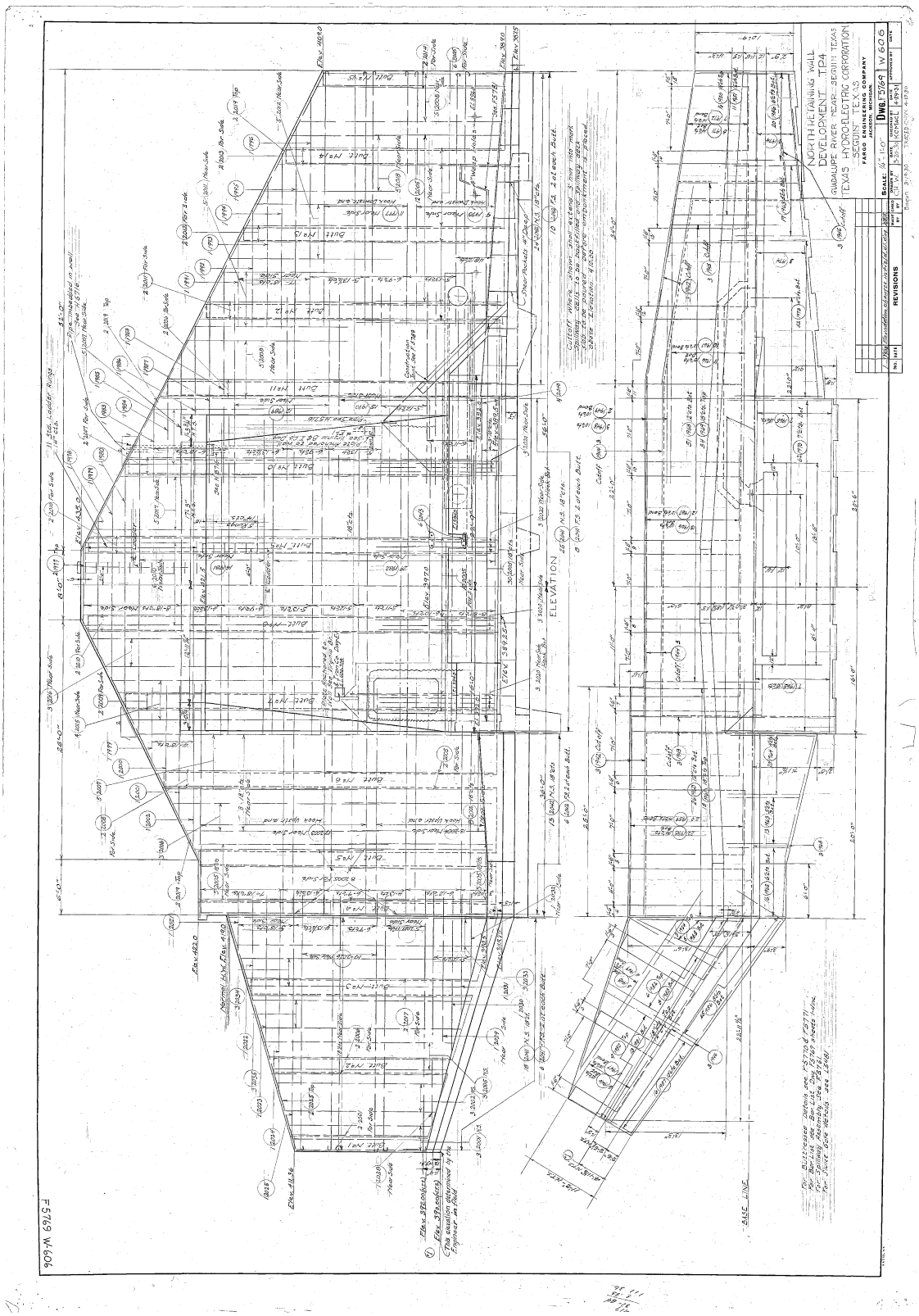


Figure 13. F5769. North Retaining Wall Development TP-4, Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/19/1930.

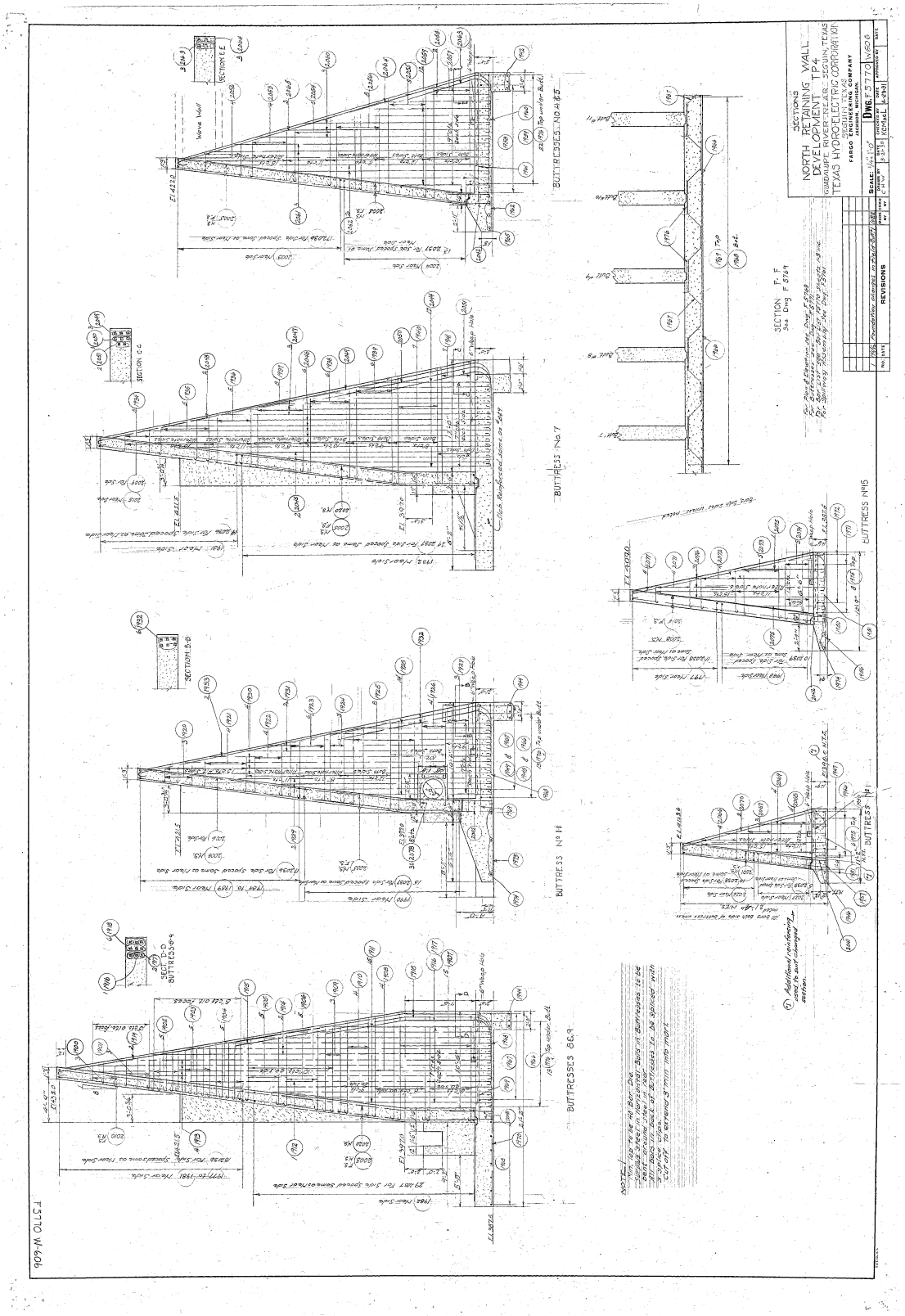


Figure 14. F5770. Sections North Retaining Wall Development TP-4. Guadalupe River Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/21/1930.

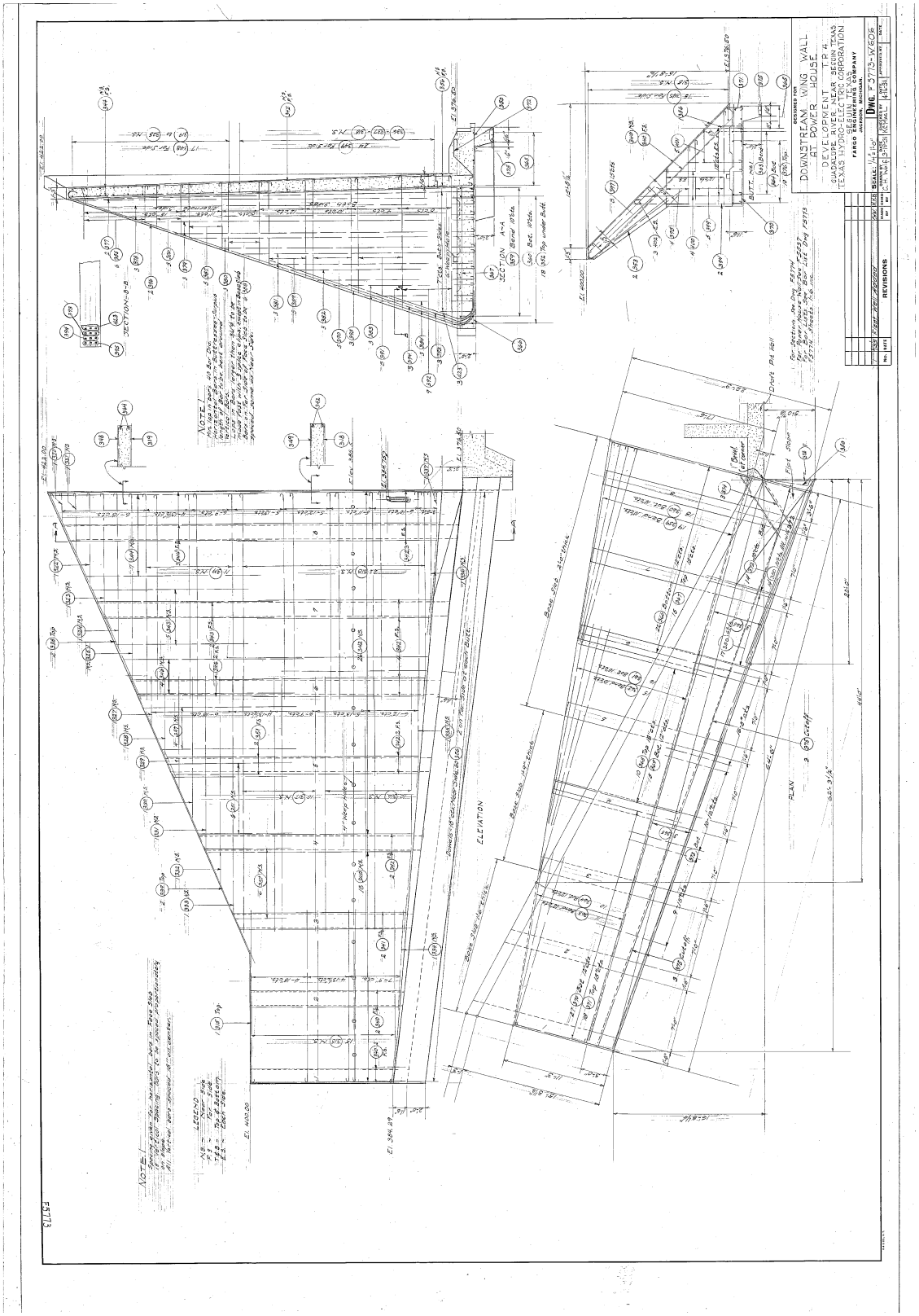


Figure 15. F5773. Downstream Wing Wall at Power House, Development No. 4, Guadalupe River, Near Seguin, Texas, Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/19/1931.

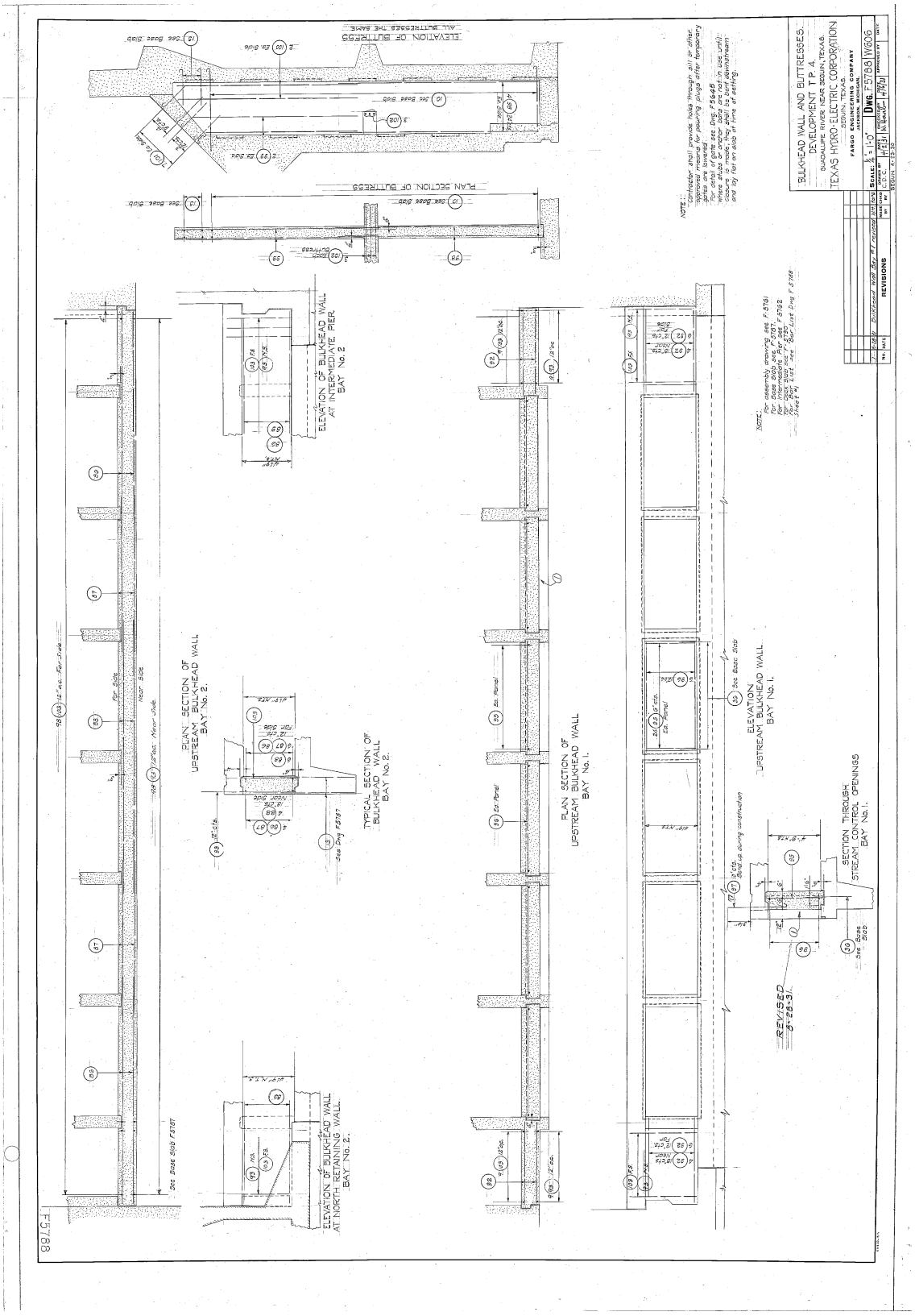


Figure 16. F5788. Bulkhead Wall and Buttresses, Development No. 4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 04/23/1930.

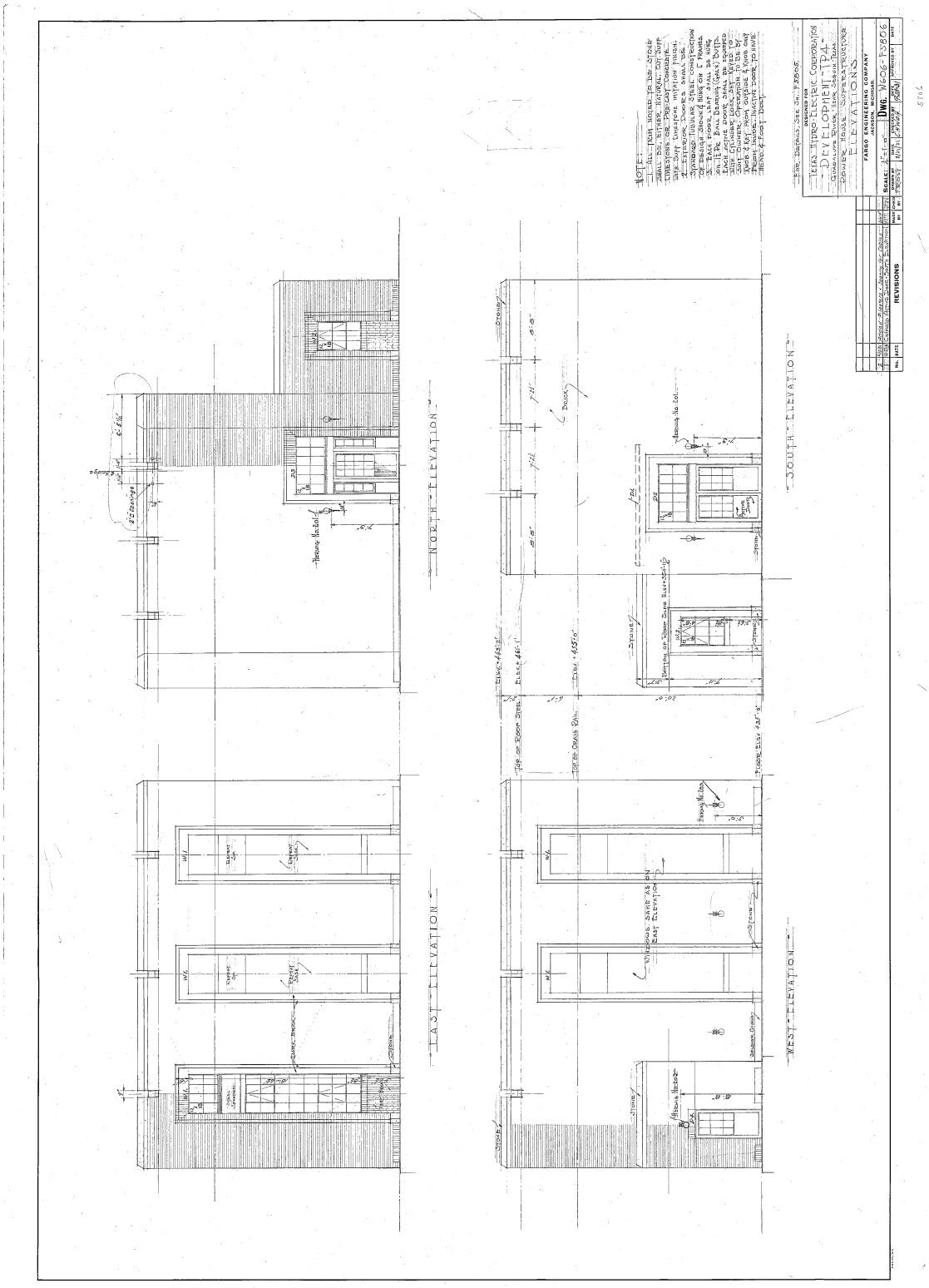


Figure 17. #F5806. Power House Superstructure Elevations Development No. 4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, dated 08/31/1931.

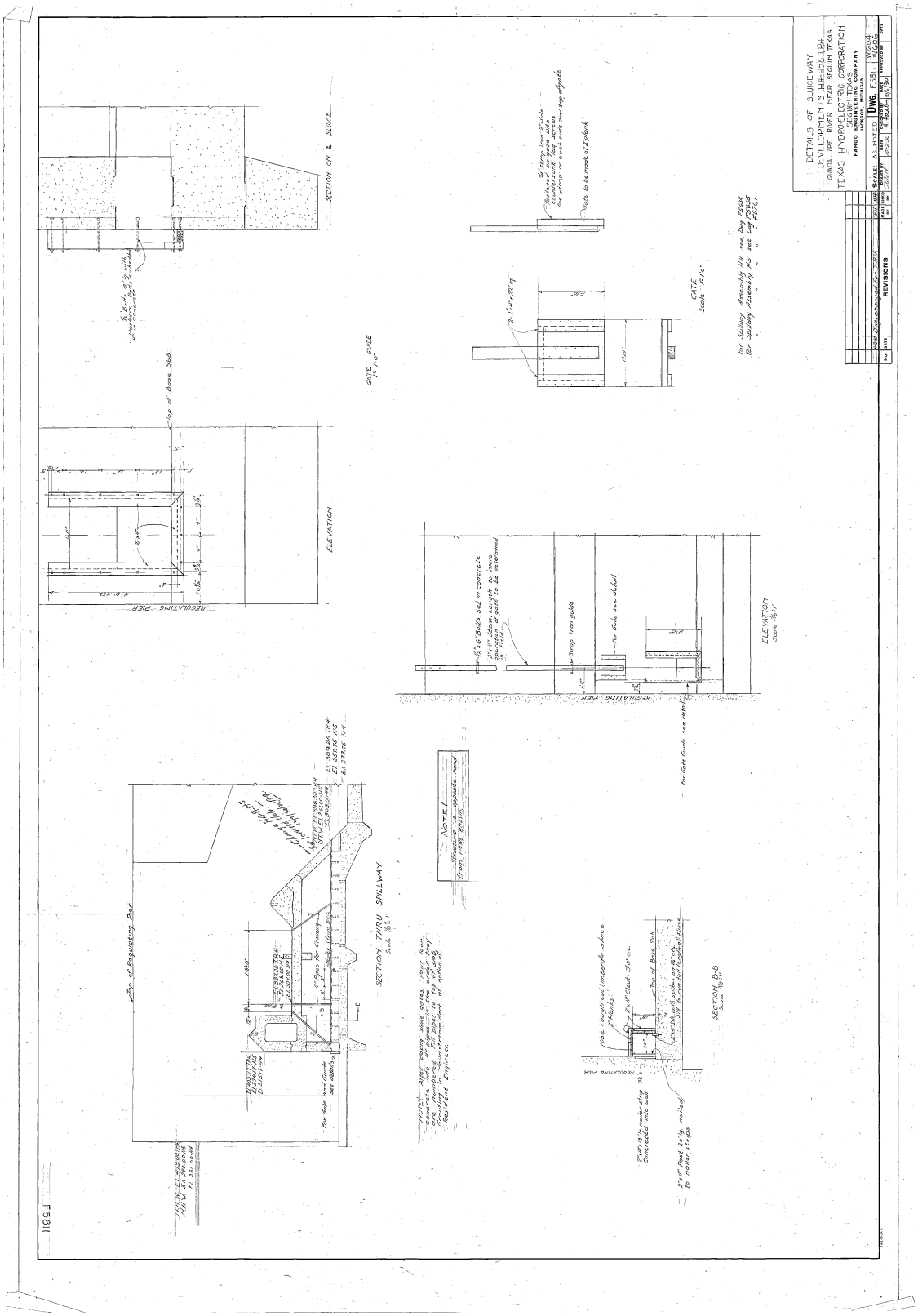


Figure 18. F5811. Details of Sluiceway, Development No. H4, H5, TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 10/02/1930.

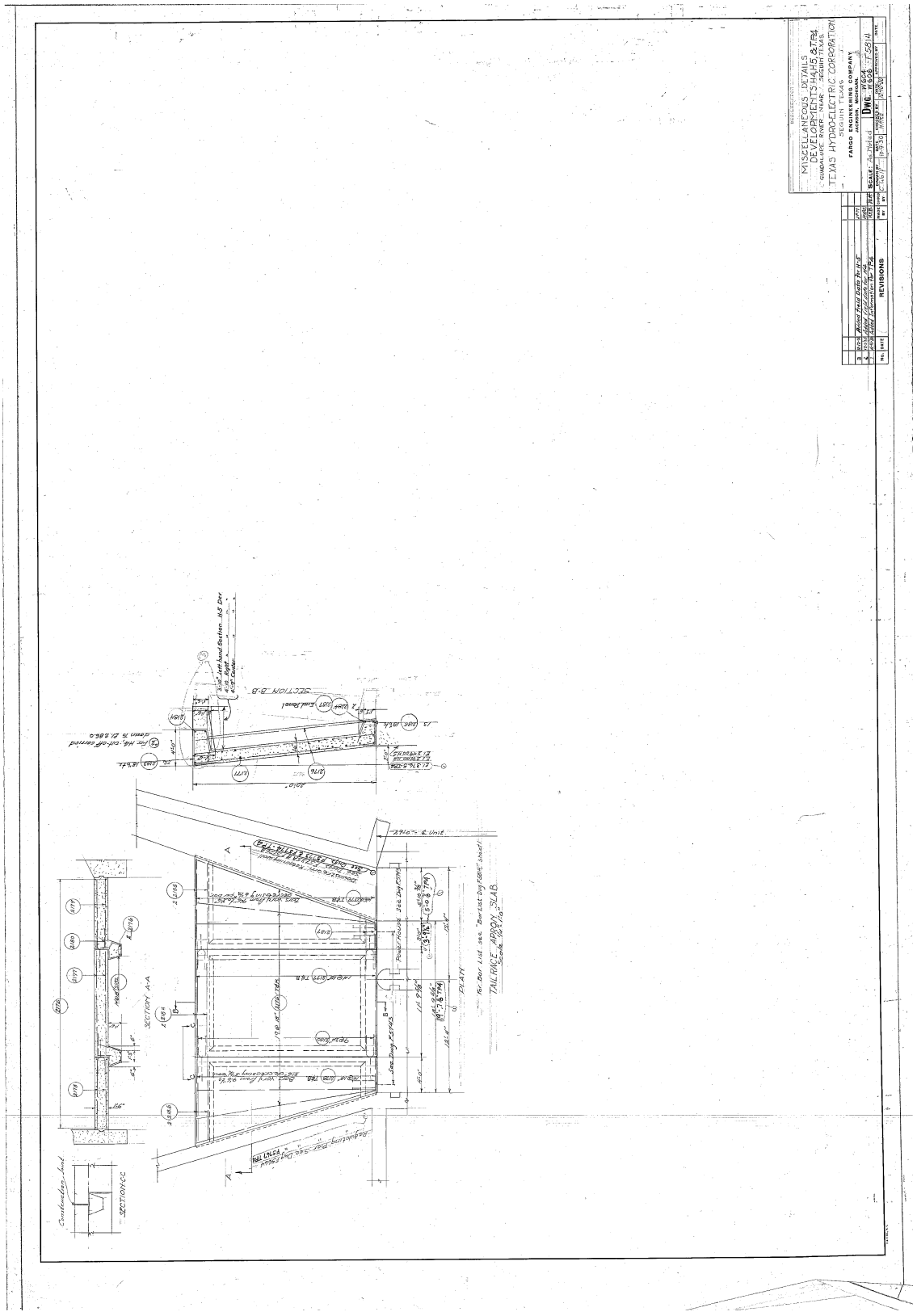


Figure 19. F5814. Miscellaneous Details Development No. H4, H5, TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 10/09/1930.

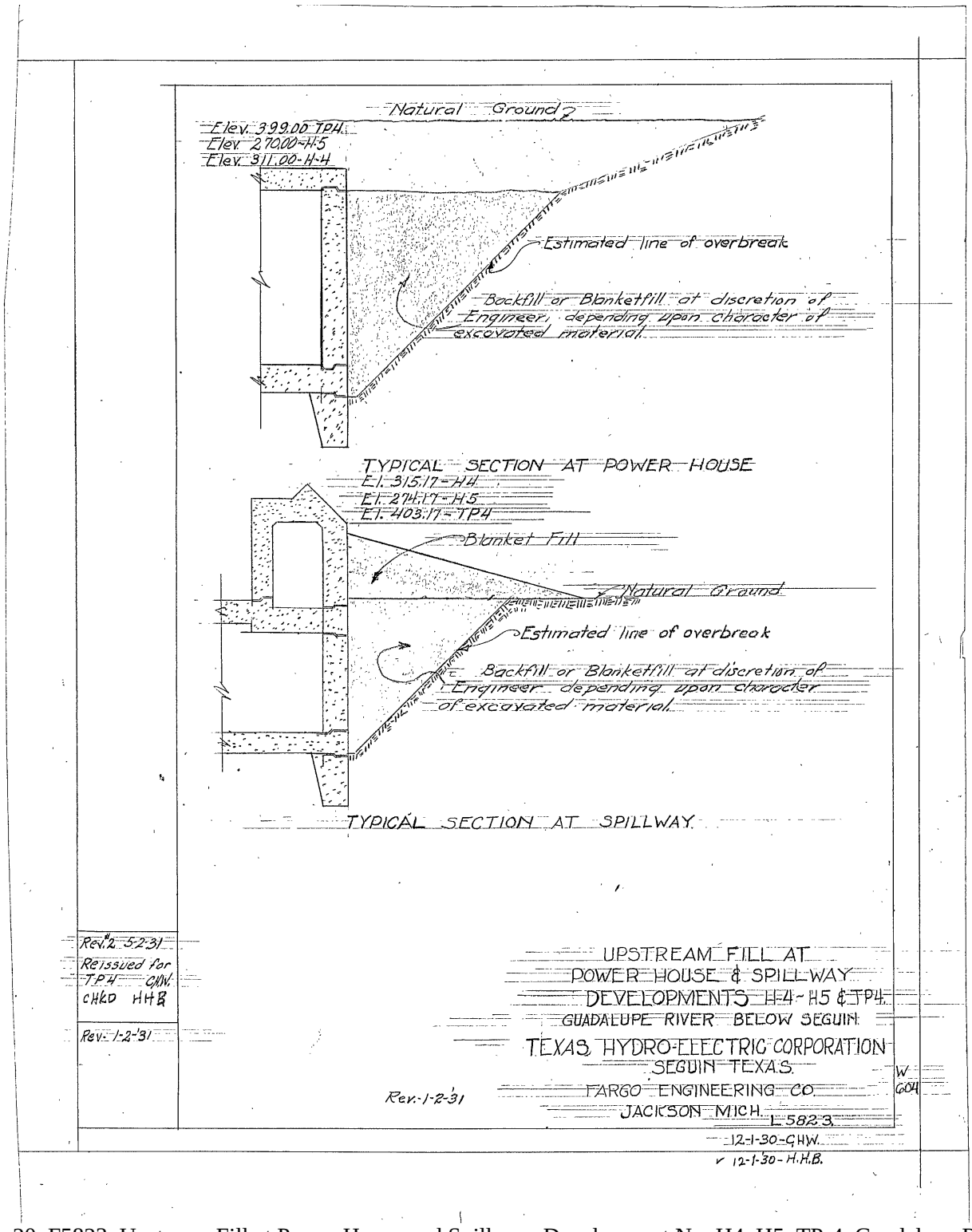


Figure 20. F5823. Upstream Fill at Power House and Spillway, Development No. H4, H5, TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 12/01/1930.

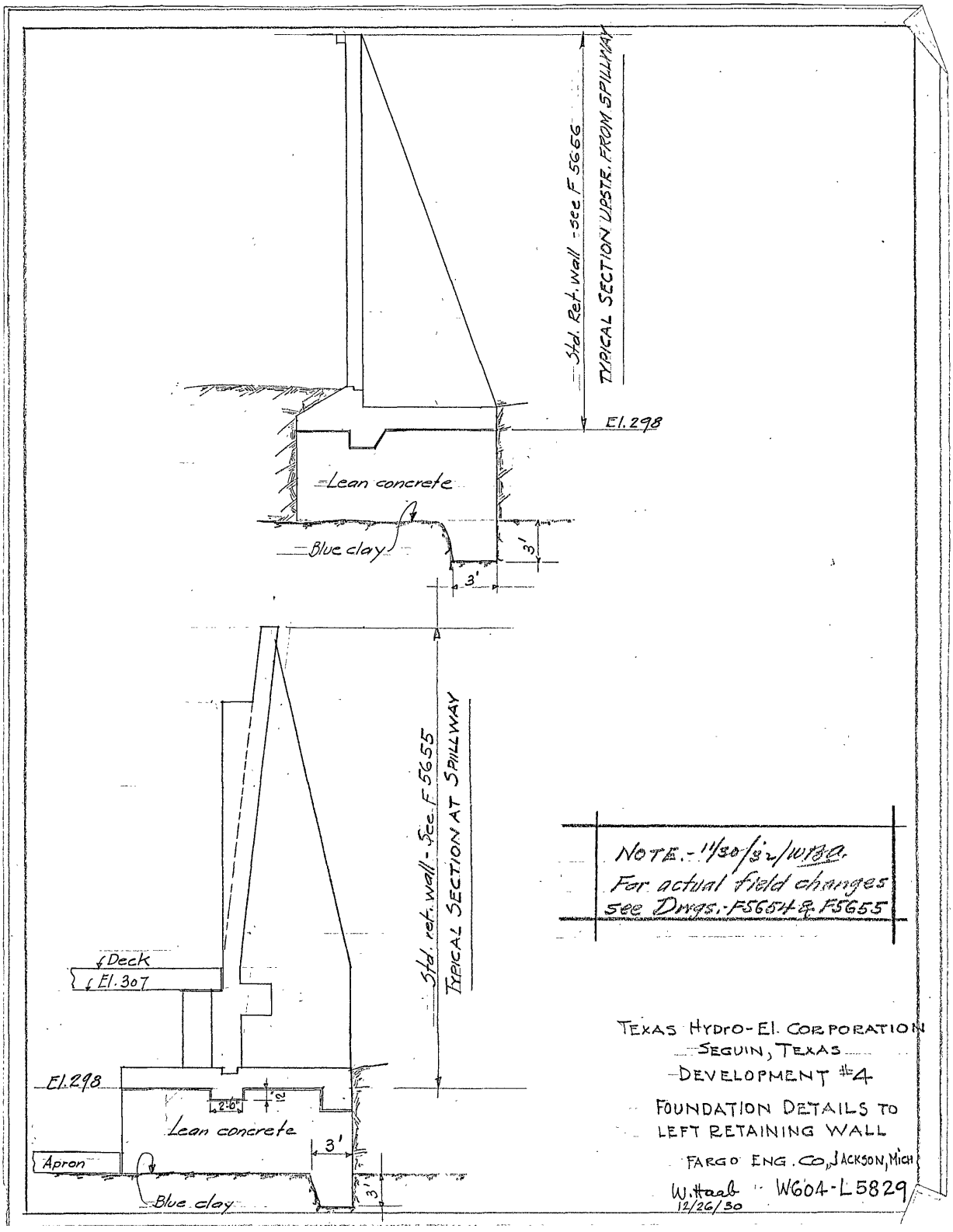


Figure 21. F5829. Foundation Details to Left Retaining Wall, Development No. TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 12/26/1930.

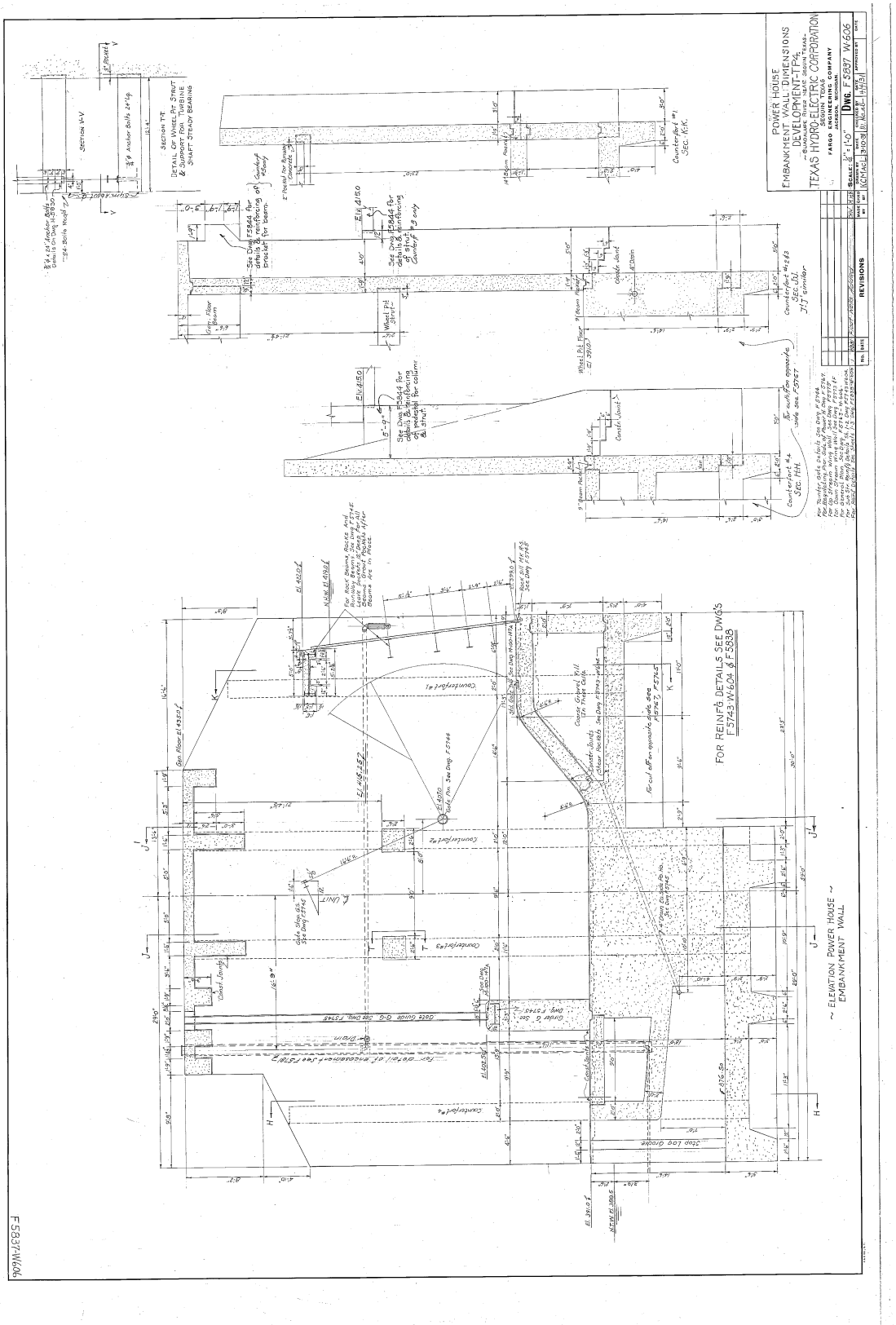


Figure 22. F5837. Power House Embankment Wall Dimensions, Development No. 4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/10/1931.

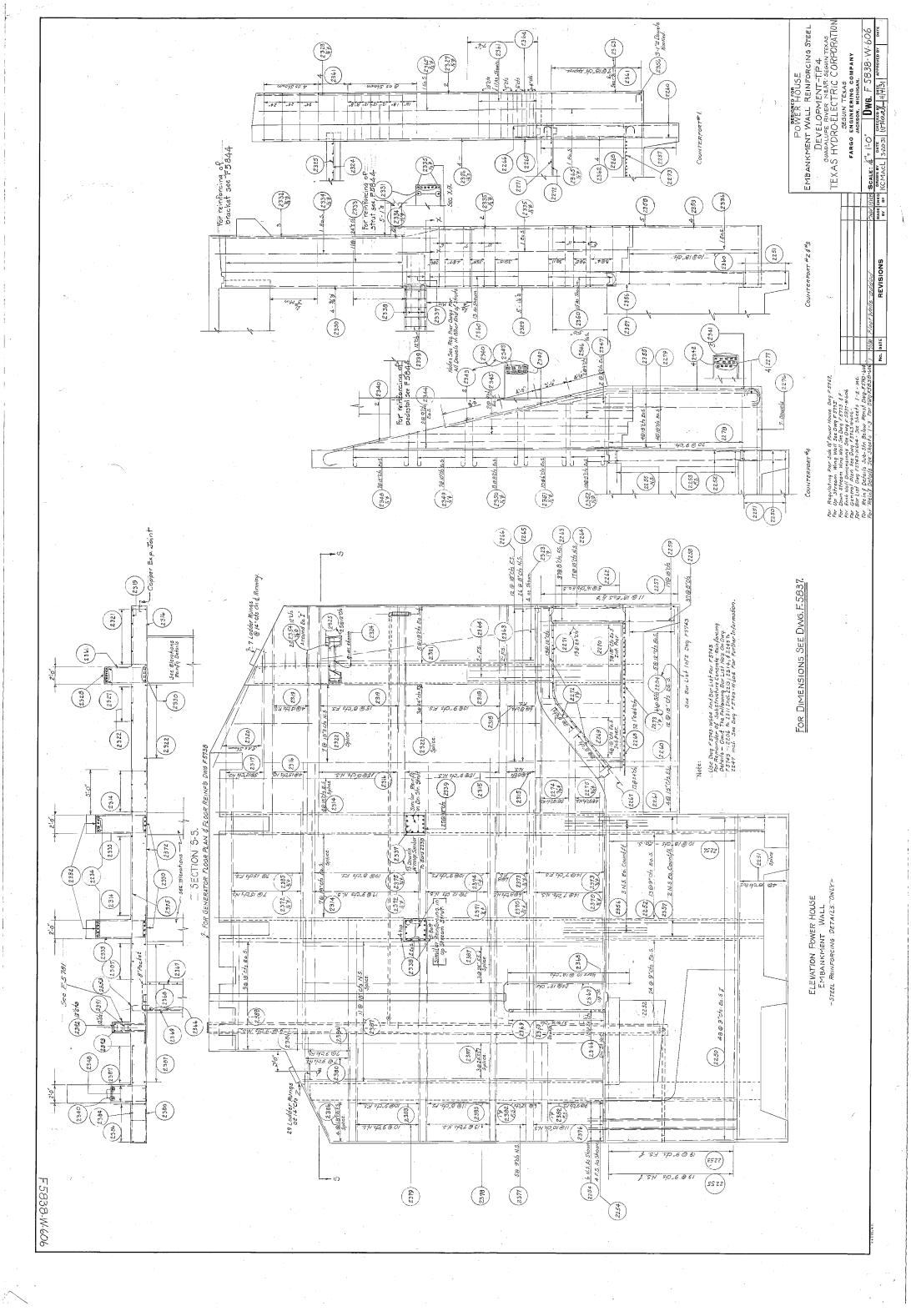


Figure 23. F5838. Power House Embankment Wall Reinforcing Steel, Development No. 4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 03/20/1931.

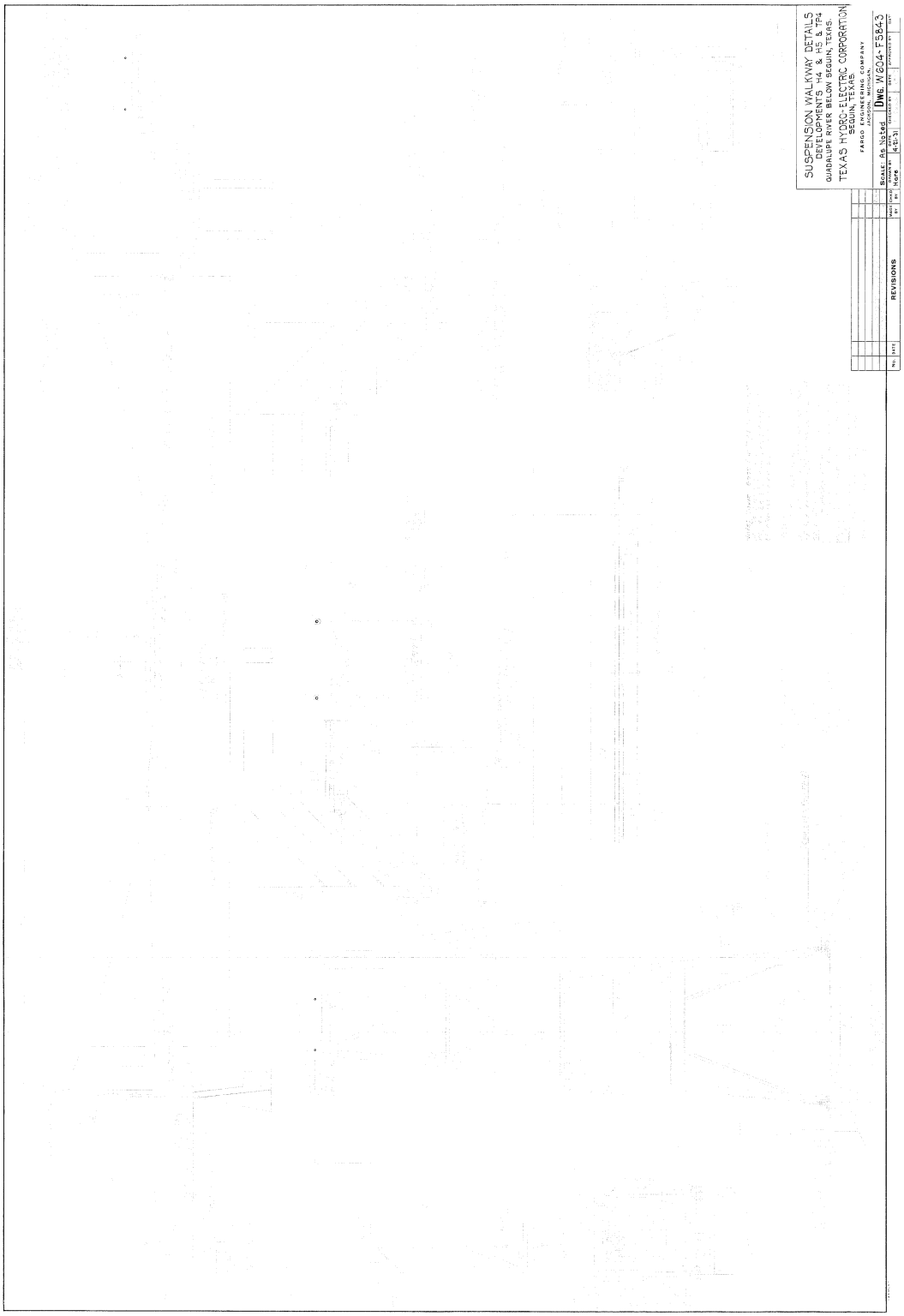


Figure 24. F5843. Suspension Walkway Details, Development No. H4, H5, TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 04/21/1931.

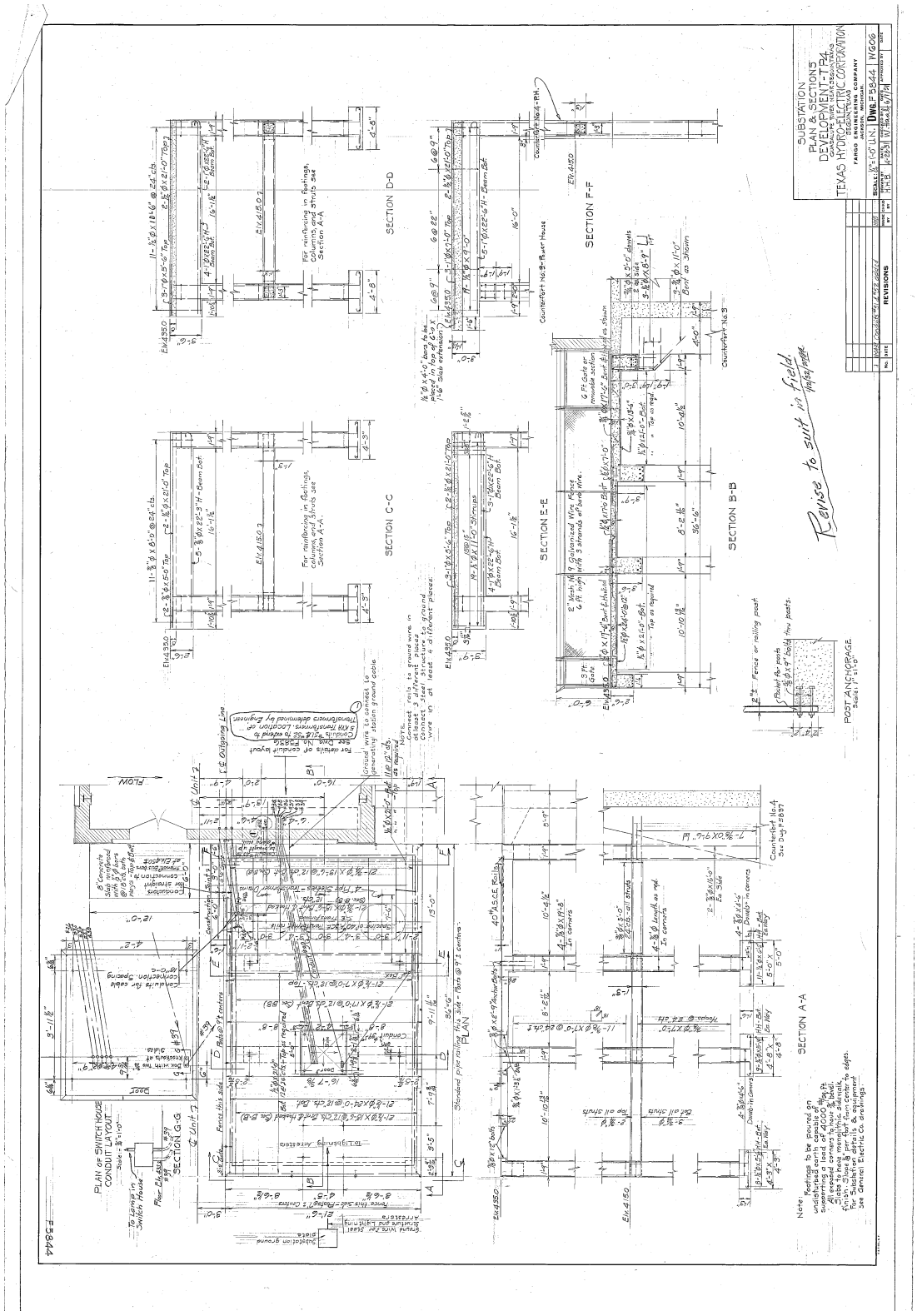


Figure 25. F5844. Substation Plan & Sections, Development No. TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 04/28/1931.

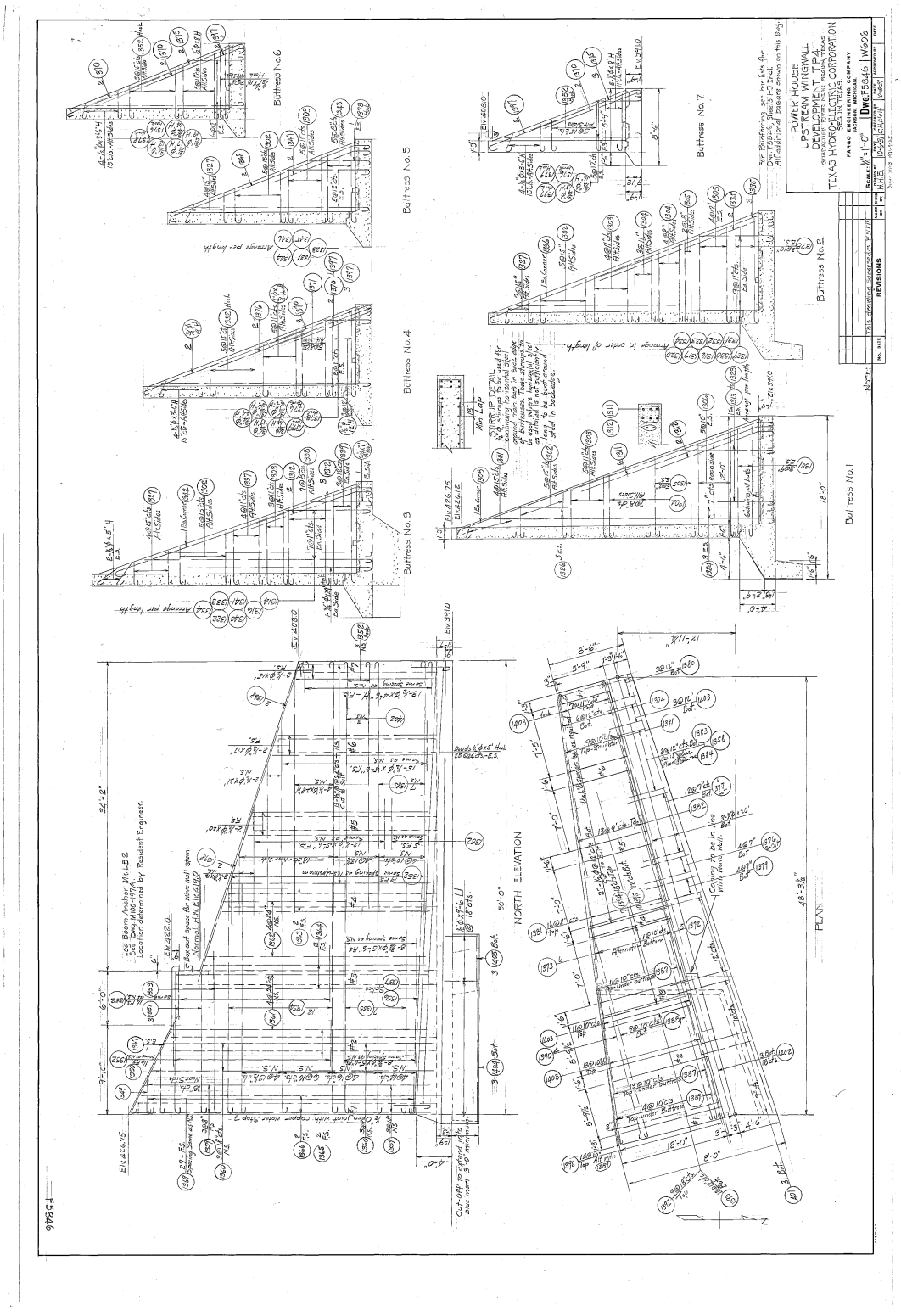
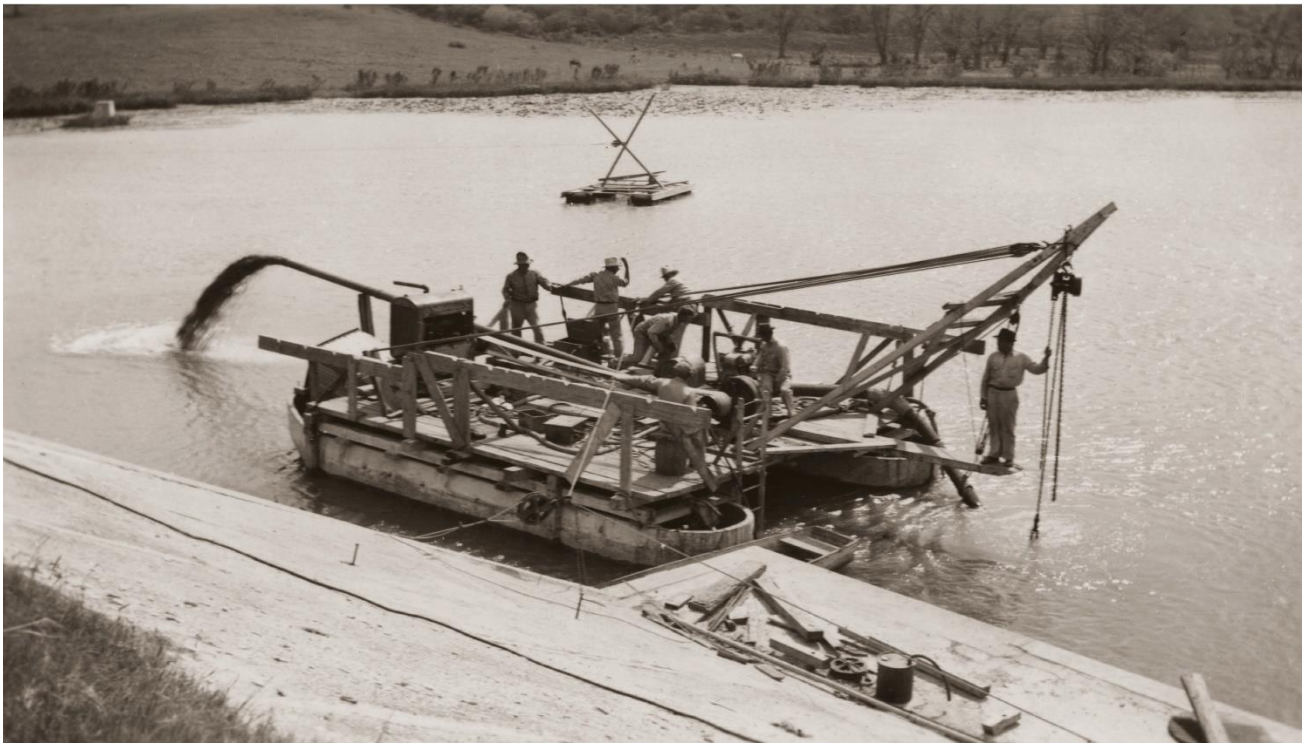


Figure 26. F5846. Power House Upstream Wingwall, Development No. TP-4, Guadalupe River, Near Seguin, Texas. Texas Hydro-Electric Corporation, Seguin, Texas. Drawn by Fargo Engineering Company, Jackson, Michigan, 09/25/1931.

APPENDIX B
HISTORIC AND DIGITAL PHOTOGRAPHS



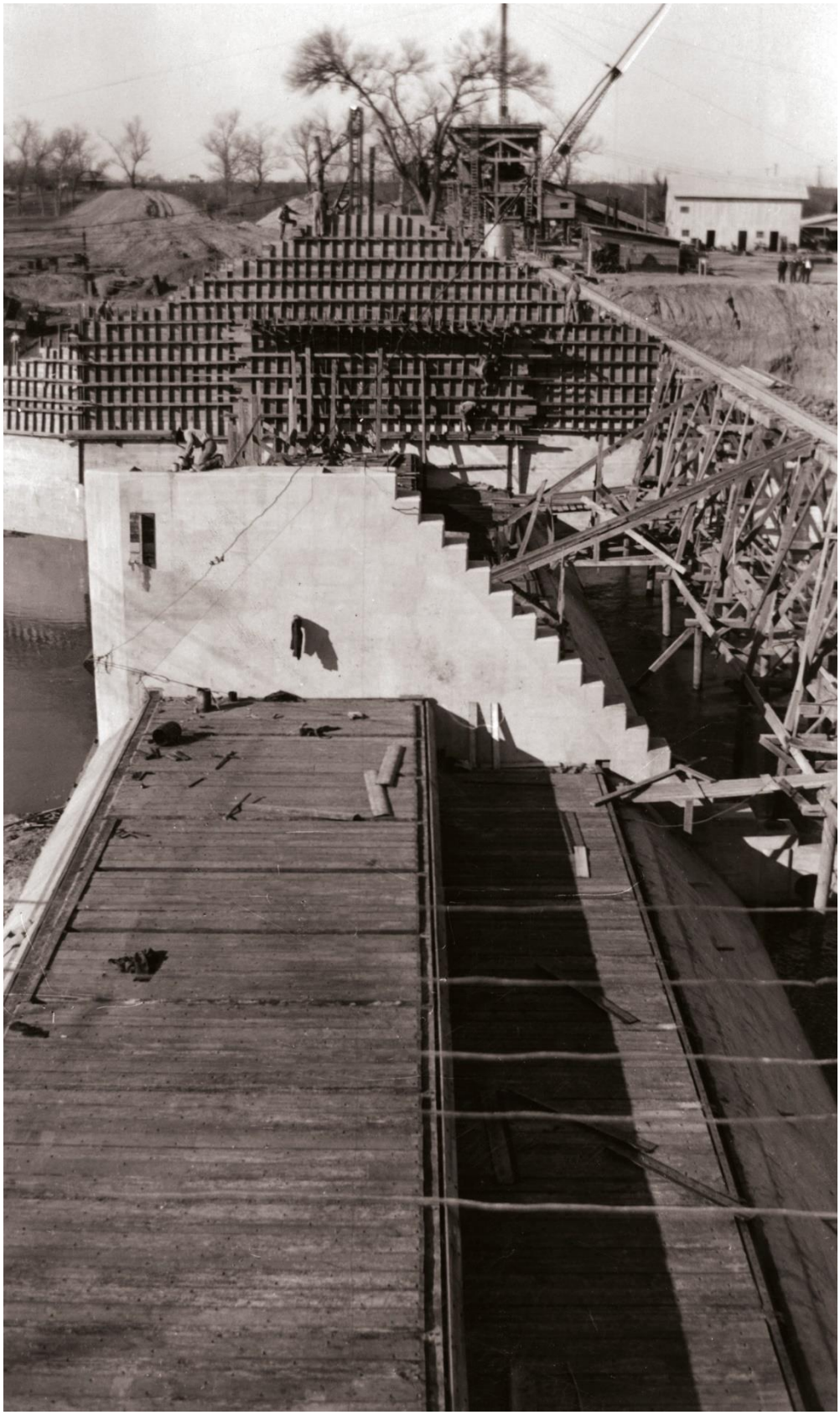
A. Barge 8x10. Ca 1930. Photograph from GBRA Archives.

B. TP-4 Looking North. 8x10. Ca. 1930. Photograph from GBRA Archives.

C. Looking south. Ca. 1930. Photograph from GBRA Archives.

D. View from the south side. Ca. 1930. Photograph from GBRA Archives.

E. South view towards the power house and showing the suspension walkway. Ca. 1930. Photograph from GBRA Archives.



F. TP-4 Looking North. Ca. 1930. Photograph from GBRA Archives.

G. Looking north, showing the foundation for the power house (left). Ca. 1930. Photograph from GBRA Archives.

H. Current photograph showing TP-4 Dam (from south) partial view of the north embankment, substation, powerhouse, spillway, view north. File: PXL_20220308_151916785

I. Current photograph showing TP-4 Dam Powerhouse, embankments, substation, and suspension walkway. Looking South. File: PXL_20220308_154753231

J. Lake Placid Dam spillway (TP-4). View North. File: PXL_20220308_151945280

K. TP-3 showing east embankment. View Northwest. File: PXL_20220308_154841019

L. Power House at Lake Placid Dam (TP-4). View West. File: PXL_20220308_150959880

M. View of substation. View Southeast. File: PXL_20220308_144847335

N. Powerhouse front entrance. View West. File: PXL_20220308_145010645

O. Close up of turbine at TP-4. View West. File: PXL_20220308_145300994

P. Underside of turbine at TP-4. File: PXL_20220308_145406726

Q. Intake controls inside Power House. File: PXL_20220308_150918903

R. Suspension walkway over the TP-4 Dam. Looking East. File: PXL_20220308_150627085

ATTACHMENT 1

**INDEX TO PHOTOGRAPHS, PHOTO KEY,
AND LARGE FORMAT PHOTOGRAPHS**

HISTORIC AMERICAN ENGINEERING RECORD SURVEY
INDEX TO PHOTOGRAPHS

TEXAS POWER CORPORATION DEVELOPMENT NUMBER 4
(Lake Placid Dam and Hydropower Complex)
Guadalupe River
Seguin vicinity
Guadalupe County
Texas

Matthew Holtkamp, Photographer, August 2022

1 AXIAL VIEW OF TP-4 NORTH EMBANKMENT CREST WITH UPSTREAM ARMORING (RIGHT), AND GRASS-COVERED DOWNSTREAM SLOPE (LEFT), LOOKING SOUTH

2 AXIAL VIEW OF TP-4 NORTH EMBANKMENT CREST WITH UPSTREAM ARMORING (LEFT), AND GRASS-COVERED DOWNSTREAM SLOPE (RIGHT), LOOKING NORTH

3 OBLIQUE VIEW OF TP-4 NORTH EMBANKMENT WITH CONCRETE ARMORING AND POWERHOUSE (RIGHT), LOOKING SOUTHEAST

4 OBLIQUE VIEW OF TP-4 UPSTREAM ARMORING WITH POWERHOUSE AND REGULATING PIER (RIGHT), AND CABLE STAYED FOOTBRIDGE, LOOKING SOUTHEAST

5 GENERAL/OBLIQUE VIEW OF TP-4 NORTH EMBANKMENT WITH GRASS-COVERED DOWNSTREAM SLOPE AND STAIRS, DOWNSTREAM ARMORING (LEFT), FOOTBRIDGE AND POWERHOUSE (LEFT), LOOKING SOUTHWEST

6 GENERAL DOWNSTREAM WIDE PERSPECTIVE OF SPILLWAY BAYS, FISHWAY, EMBANKMENT AND VEGETATION, LOOKING SOUTHWEST

7 DOWNSTREAM PERSPECTIVE VIEW OF TP-4 SPILLWAY BAYS WITH FISHWAY AND CABLE STAYED FOOTBRIDGE (CENTER), REGULATING PIER AND POWERHOUSE AND SUBSTATION (LEFT), LOOKING SOUTHWEST

8 DOWNSTREAM PERSPECTIVE VIEW OF TP-4 NORTH EMBANKMENT CREST WITH UPSTREAM ARMORING (LEFT), AND GRASS-COVERED DOWNSTREAM SLOPE (RIGHT), LOOKING NORTH SPILLWAY BAYS WITH SPILL GATES, TERRACED BASE SLABS, FISHWAY AND CABLE STAYED FOOTBRIDGE (CENTER), REGULATING PIER AND POWERHOUSE AND SUBSTATION (LEFT), LOOKING SOUTHWEST

9 VIEW OF TP-4 DOWNSTREAM (NORTH BANK) ARMORING (RIGHT), FOOTBRIDGE AND SPILLWAY/SPILLGATES (LEFT)

10 AXIAL VIEW OF TP-4 NORTH EMBANKMENT CREST NEAR SPILLWAY WITH UPSTREAM ARMORING (RIGHT),

FOOTBRIDGE PYLON (CENTER) AND GRASS-COVERED DOWNSTREAM SLOPE (LEFT) WITH POWER HOUSE IN BACKGROUND, LOOKING SOUTH

11 DOWNSTREAM OBLIQUE PERSPECTIVE VIEW ABOVE TP-4 SPILLWAY BAYS WITH SPILL GATES, TERRACED BASE SLABS, FISHWAY AND CABLE STAYED FOOTBRIDGE (TOP), REGULATING PIER AND POWERHOUSE AND SUBSTATION (RIGHT), LOOKING SOUTHEAST

12 DOWNSTREAM AXIAL PERSPECTIVE VIEW ABOVE TP-4 SPILLWAY BAYS WITH SPILL GATES, TERRACED BASE SLABS, FISHWAY AND CABLE STAYED FOOTBRIDGE (TOP), REGULATING PIER AND POWERHOUSE AND SUBSTATION (CENTER), LOOKING SOUTH

13 INTERIOR PERSPECTIVE OF TP-4 POWERHOUSE WITH ORIGINAL GENERAL ELECTRIC COMPANY GENERATOR AND CONTROL PANELS, LOOKING SOUTHWEST

14 VIEW FROM POWERHOUSE, ABOVE SPILLWAY, WITH BEAR TRAP SPILL GATES, TERRACED BASE SLABS, FISHWAY, NORTH BANK RETAINING WALL, AND FOOTBRIDGE CLOSE-UP, LOOKING NORTH

15 DOWNSTREAM PERSPECTIVE VIEW OF TP-4 SUBSTATION, POWERHOUSE, SOUTH EMBANKMENT ARMORING, AND REGULATING PIER (LEFT), SPILLWAY, SPILL GATES, FISHWAY, AND FOOTBRIDGE (CENTER) AND NORTH BANK RETAINING WALL (RIGHT), LOOKING NORTHWEST

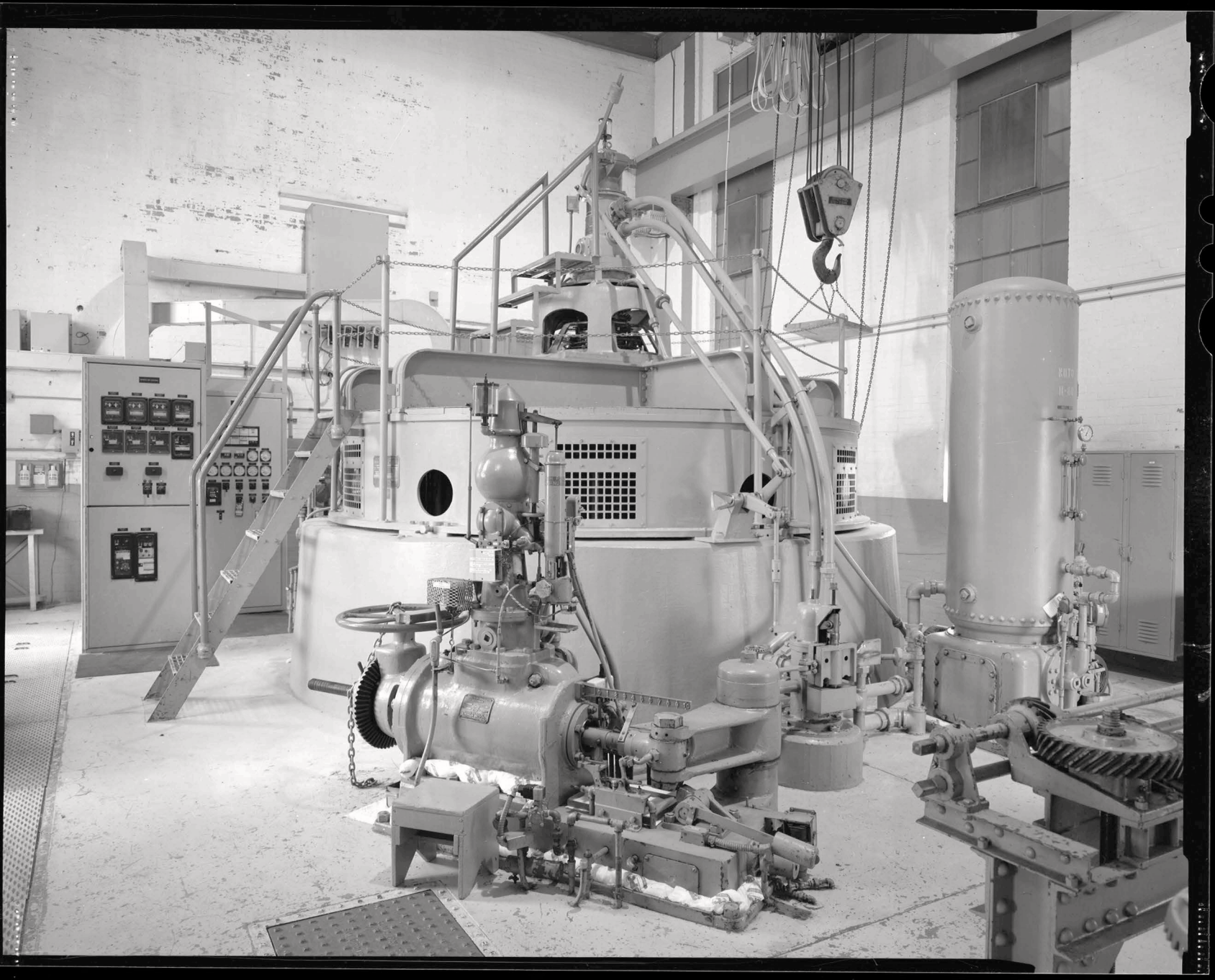
16 UPSTREAM PERSPECTIVE VIEW OF TP-4 SUBSTATION, POWERHOUSE, GRASS-COVERED SOUTH EMBANKMENT, AND REGULATING PIER (RIGHT), FISHWAY AND FOOTBRIDGE (CENTER) AND NORTH BANK RETAINING WALL (LEFT), LOOKING NORTHEAST

17 AXIAL VIEW OF TP-4 SOUTH EMBANKMENT CREST AND ROADWAY WITH SUBSTATION AND POWERHOUSE, LOOKING NORTH


RESTRICTED AREA
NO ONE ALLOWED WITHIN
400 FEET OF DAM


GERA


GBRA
WARNING




RESTRICTED AREA
NO ONE ALLOWED WITHIN
400 FEET OF DAM

ATTACHMENT 2

PROGRAMMATIC AGREEMENT

PROGRAMMATIC AGREEMENT
AMONG
THE UNITED STATES ARMY, CORPS OF ENGINEERS, FORT WORTH DISTRICT,
THE TEXAS STATE HISTORIC PRESERVATION OFFICER,
AND GUADALUPE-BLANCO RIVER AUTHORITY,
REGARDING THE LAKE MCQUEENEY SPILLGATE REPLACEMENT AND DAM ARMORING AND THE LAKE PLACID SPILLGATE AND DAM ARMORING
LOCATED IN GUADALUPE COUNTY, TEXAS

Permit Numbers: SWF-2021-00376 and SWF-2021-00377

WHEREAS, the United States Army Corps of Engineers, Fort Worth District (USACE), the lead Federal agency, is reviewing two permit applications under Section 404 of the Clean Water Act to authorize dredge and fill activities for modification of the Lake McQueeney Spillgate Replacement and Dam Armoring project and the Lake Placid Spillgate and Dam Armoring project (Projects) by Guadalupe-Blanco River Authority (GBRA) in Guadalupe County (Reference Attachment A); and

WHEREAS, these Projects require a USACE permit in compliance with Section 404 of the Clean Water Act; and

WHEREAS, these two activities requiring USACE permits pursuant to Section 404 of the Clean Water Act constitute undertakings (Undertakings) under Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended); and

WHEREAS, the USACE, in consultation with the Texas State Historic Preservation Officer (SHPO), considered the potential effects of the Projects as provided in 33 CFR 325, Appendix C and 36 CFR 800 and established an Area of Potential Effects (APE) for direct and indirect effects to include these Projects, associated temporary and permanent workspace, and impacts to waters of the U.S.; and

WHEREAS, on behalf of GBRA, SWCA Environmental Consultants completed cultural resource surveys titled *Historic Resources Survey of the Lake McQueeney Spillgate Replacement and Dam Armoring Project, Seguin, Guadalupe County, Texas,* dated April, 2022, and *Historic Resources Survey of the Lake Placid Spillgate Replacement and Dam Armoring Project, Seguin, Guadalupe County*, dated April, 2022, which recommended Lake McQueeney Dam (resource TP-3) and Lake Placid Dam (resource TP-4) as eligible for the National Register of Historic Places (NRHP), and recommended the Projects' effects as adverse; and,

WHEREAS, the USACE concurred with the SWCA eligibility and effect recommendations and the SHPO has concurred with the USACE determination that the proposed effect to these Projects as a result of the Undertakings is adverse , and:

WHEREAS, USACE and the SHPO invited GBRA to participate in the consultation and to join this Programmatic Agreement (PA) as an Invited Signatory; and

WHEREAS, the USACE has consulted with the Guadalupe County Historical Commission, City of Seguin, Seguin Conservation Society, and the Seguin Guadalupe County Heritage Museum, and invited them to sign this PA as concurring parties; and

WHEREAS, USACE, in accordance with 33 CFR 325, Appendix C(2) and 36 CFR 800.2(c), the USACE has provided consulting parties with documentation regarding findings of the adverse effects, sought their views on the proposed effects to these Projects, and provided them with the proposed mitigation measures (as well as the public outreach component), including review of this PA; and

WHEREAS, USACE, in accordance with 33 CFR 325, Appendix C(7)(d) and 36 CFR 800.6(a)(1), notified the ACHP of its adverse effect determination with specified documentation, and the ACHP chose not to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); and,

WHEREAS, the USACE, the SHPO, and GBRA agreed to accomplish compliance with Section 106 through the development and execution of this PA, and to ensure that GBRA provides mitigation for the adverse effects to the Projects as outlined in the stipulations of this PA, and this PA will be a permit condition for any USACE permit issued for the Project; and

NOW, THEREFORE; the USACE, the SHPO, and GBRA agree that these Projects shall be implemented in accordance with the following stipulations in order to take into account the adverse effects to satisfy the USACE's Section 106 responsibilities for these Projects.

STIPULATIONS

The USACE will ensure that the following stipulations are carried out by GBRA to mitigate adverse effects to the Projects resultant from the Undertakings.

I. MONITORING

a. GBRA shall ensure that a qualified archeologist with a minimum of five years of professional experience performs the archeological monitoring in areas of the APE as required by USACE and the SHPO. The SHPO shall issue an archeological permit for monitoring of the APE during periods of lake level lowering as related to the Lake McQueeney Spillgate Replacement and Dam Armoring project.

II. MINIMIZATION AND MITIGATION

A. Minimization.

a. GBRA shall ensure that minimization efforts are performed during all construction activities within 100 feet of site 41GU233. These minimization details include erecting high visibility fencing along the access road through site 41GU233 and laying geotextile along the access road through site 41GU233 to ensure inadvertent impacts to portions of this site that have an undetermined eligibility for listing to the NRHP are avoided.

B. Mitigation

a. If previously unknown eligible archaeological resources are discovered during archeological monitoring and will be adversely affected by the undertaking, GBRA will complete mitigation-level documentation, excavation, and/or archival research as appropriate to mitigate adverse effects. A separate Research Design shall be developed and approved by USACE and SHPO for mitigation of adverse effects of previously unidentified prehistoric or historic features.

b. Recordation. Within one year of signing this agreement, GBRA shall separately record Lake McQueeney and Lake Placid dams to the written standards of the Historic American Engineering Record (HAER) Level II and the digital photographic standards of the National Park Service (see https://www.thc.texas.gov/nr-photo and https://www.nps.gov/subjects/nationalregister/upload/Photo_Policy_update_2013_05_15_508.pdf).
   i. The undertakings may commence once the digital photo documentation is complete.
   ii. All documentation shall be conducted by personnel that meet the Secretary of the Interior's Professional Qualifications Standards in architectural history and/or history.
   iii. Drafts shall be submitted to the USACE and THC for a 30-day review and revised until accepted by the USACE and THC.
   iv. Hard copies of the final reports on archival paper shall be placed in up to five local and regional libraries (as determined in consultation with the THC) and one copy given to the THC for its archives.
   v. Digital copies of the final in PDF format shall be distributed to all signatories via email.

c. Interpretive Materials. Within one year of signing this agreement, GBRA shall develop public brochures for McQueeney and Lake Placid dams in a digital PDF format from the materials assembled for the recordation. The brochures shall be designed in a way that the contents can be easily transferred to website content as needed.
   i. Drafts shall be submitted to the USACE and THC for a 30-day review and revised until accepted by the USACE and THC.
   ii. Digital copies of the final in PDF format shall be distributed to all signatories via email.

d. Public Availability of Recordation and Interpretive Materials. For a minimum period of five years after completion of the Recordation and Interpretive Materials, GBRA shall make all documents available on its website to the public for download. GBRA shall also make the materials available for inclusion on a minimum of one other website related to interest in the resources (e.g., the Portal to Texas History). GBRA shall copy furnish USACE and THC on all emails regarding submission of materials and links to the webpages if the materials are accepted for hosting by any websites contacted.

III. CURATION AND DISPOSITION OF MATERIALS, RECORDS AND REPORTS

A. *Curation.* GBRA shall ensure that materials and associated records as required for mitigation in this PA, are accessioned into a curatorial facility that has been certified, or granted provisional status, by the SHPO in accordance with Chapter 29.6 of the Texas Historical Commission rules (Rules of Management and Care of Artifacts and Collections).

B. *Reports.* GBRA shall provide copies of final documentation as required for mitigation to the signatories and consulting parties. The signatories and consulting parties shall withhold from the public all site location information and other data that may be of a confidential or sensitive nature pursuant to 33 CFR 325, Appendix C(4)(c) and 36 CFR 800.11(c).

IV. PROFESSIONAL QUALIFICATIONS

All historic preservation-related investigations and mitigation requirements specified in this Agreement shall be performed by personnel meeting professional qualifications of the Secretary of the Interior's *Professional Qualification Standards (*36 CFR 61) in historic architecture and archeology.

V. DISPUTE RESOLUTION

Should any Signatory to this PA object within thirty (30) calendar days upon receipt of any plans or other documents, pursuant to this PA, provided by USACE, the SHPO, GBRA, or others for review, or object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the objector is encouraged to consult the other signatories in resolving the objection. If the USACE determines that such objection cannot be resolved, USACE shall perform the following tasks.

A. CONSULT ACHP. Forward all documentation relevant to the dispute, including the USACE's proposed resolution, to the ACHP. The ACHP shall provide the USACE with its advice on the resolution of the objection within 30 days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the USACE shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and shall provide them with a copy of this written response. The USACE will then proceed according to its final decision.

B. FINAL DECISION. If the ACHP does not provide its advice regarding the dispute within the 30-day time period, the USACE may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the USACE shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the PA, and shall provide the signatories, concurring parties, and the ACHP with a copy of such written response.

C. The parties shall carry out all other actions subject to the terms of this PA that are not the subject of the dispute.

VI. DURATION, AMENDMENT, AND TERMINATION:

A. DURATION. Unless terminated or amended as outlined below, this Agreement shall remain in effect for a period of ten (10) years from the date the PA goes into effect and may be extended for an additional 5-year term with the written consent of all the signatories.

B. AMENDMENT. This Agreement may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

C. TERMINATION. Any Signatory to this agreement may terminate this PA by providing thirty (30) calendar days written notice to the other Signatories, pursuant to 36 CFR 800.6(c)(8). During the period after notification and prior to termination, the Signatories shall consult to seek agreement on amendments or other actions that would avoid termination. Termination of this PA will require compliance with 36 CFR 800. This PA may be terminated by the execution of a subsequent PA that explicitly terminates or supersedes its terms.

VII. REPORTING AND MONITORING:

Each year following the execution of the PA until it expires or it is terminated, GBRA shall provide all parties to this PA a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in GBRA's efforts to carry out the terms of the PA.

VIII. EXECUTION:

Signature of this Programmatic Agreement by the USACE, the SHPO, GBRA, and implementation of its terms evidence that the USACE has taken into account the effects of this Project on historic properties and afforded the ACHP an opportunity to comment. Pursuant to 36 CFR 800.6(b)(1)(iv) this Agreement will go into effect when a fully executed version is received by the ACHP.

PROGRAMMATIC AGREEMENT
AMONG
THE UNITED STATES ARMY, CORPS OF ENGINEERS, FORT WORTH DISTRICT,
THE TEXAS STATE HISTORIC PRESERVATION OFFICER,
AND GUADALUPE-BLANCO RIVER AUTHORITY,
REGARDING THE LAKE MCQUEENEY SPILLGATE REPLACEMENT AND DAM ARMORING AND THE LAKE PLACID SPILLGATE AND DAM ARMORING
LOCATED IN GUADALUPE COUNTY, TEXAS

Permit Numbers: SWF-2021-00376 and SWF-2021-00377

SIGNATORY:

United States Army, Corps of Engineers, Fort Worth District

Brandon Mobley
_____
Brandon W. Mobley, Chief, Regulatory Division

Date 30 Nov 2022

PROGRAMMATIC AGREEMENT
AMONG
THE UNITED STATES ARMY, CORPS OF ENGINEERS, FORT WORTH DISTRICT,
THE TEXAS STATE HISTORIC PRESERVATION OFFICER,
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Permit Numbers: SWF-2021-00376 and SWF-2021-00377

SIGNATORY:

Texas State Historic Preservation Office

Mark Wolfe

Mark Wolfe, State Historic Preservation Officer

Date 11/29/22

PROGRAMMATIC AGREEMENT
AMONG
THE UNITED STATES ARMY, CORPS OF ENGINEERS, FORT WORTH DISTRICT,
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LOCATED IN GUADALUPE COUNTY, TEXAS

Permit Numbers: SWF-2021-00376 and SWF-2021-00377

INVITED SIGNATORY:

Guadalupe-Blanco River Authority

Charlie Hickman

Charles Hickman, Executive Manager of Engineering

Date 11/22/22

PROGRAMMATIC AGREEMENT
AMONG
THE UNITED STATES ARMY, CORPS OF ENGINEERS, FORT WORTH DISTRICT,
THE TEXAS STATE HISTORIC PRESERVATION OFFICER,
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LOCATED IN GUADALUPE COUNTY, TEXAS

Permit Numbers: SWF-2021-00376 and SWF-2021-00377

CONCURRING PARTY:

City of Seguin

Kyle Kramm _____ Date 11/16/22
Kyle Kramm, Main Street Director & Historic Preservation Officer

Attachment A

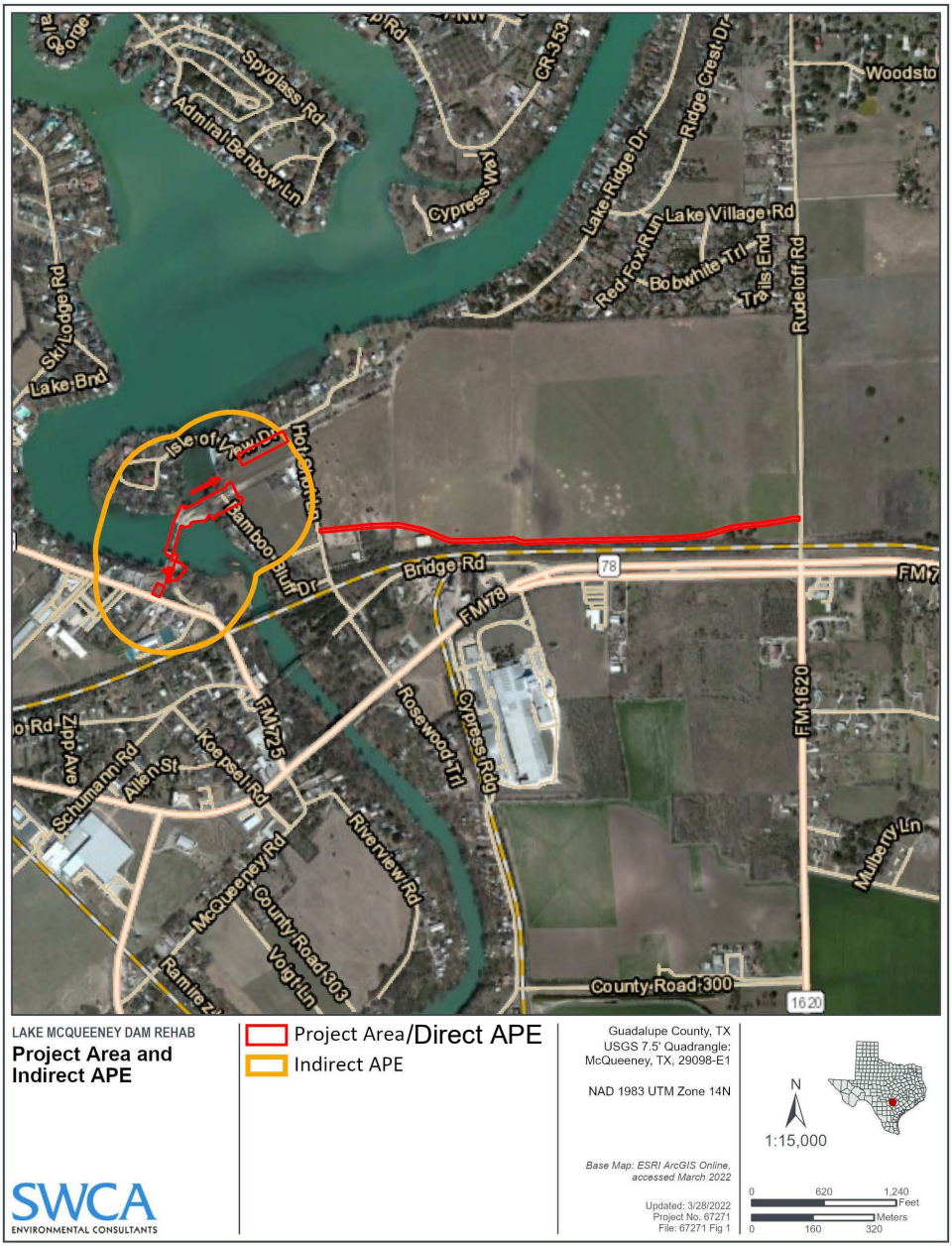
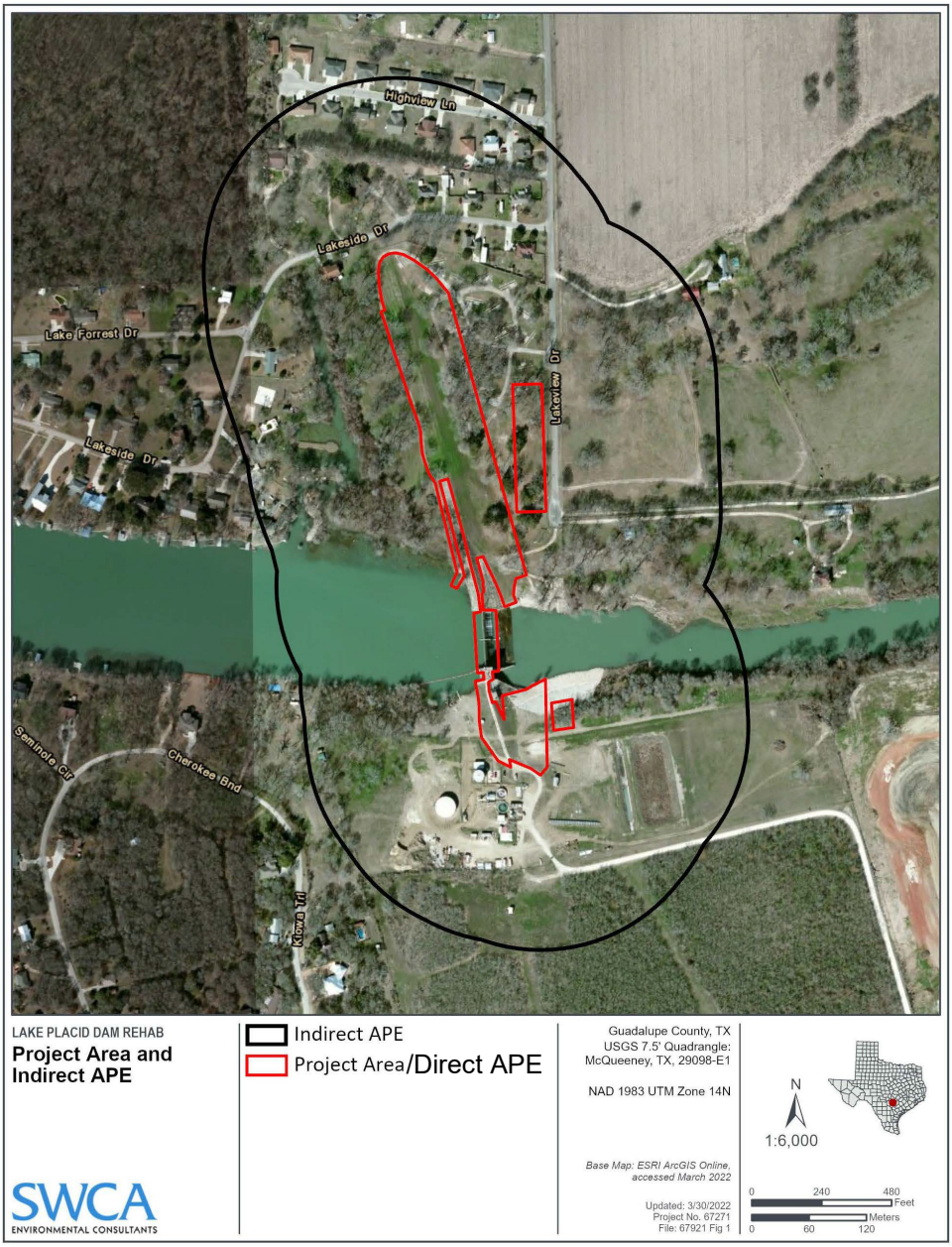


Figure 2. The direct and indirect APEs for the proposed project.



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