PRELIMINARY ENGINEERING REPORT

FOR THE

CITY OF CUMBERLAND
ALLEGANY COUNTY, MARYLAND

RIVER PARK & NORTH BRANCH POTOMAC INDUSTRIAL DAM REMOVAL

CEC PROJECT #328-386

JANUARY 2024

Recreation Engineering & Planning

Civil & Environmental Consultants, Inc.

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1. INTRODUCTION

A. Project Background

The River Park at Canal Place embodies a long-held vision for transforming Cumberland and Allegany County into a hub for outdoor enthusiasts. This initiative aims to unlock the recreational potential of the Potomac River, drawing inspiration from the success of Cumberland's Great Allegheny Passage and the C&O Canal Towpath Trail (Towpath). At its core, the project seeks to create a family-friendly whitewater park, converting the previously perceived obstacle of what is known locally as the “Blue Bridge Dam” into an opportunity. The removal of part of the dam allows for innovative whitewater features catering to various skill levels and to promote fish passage upstream of the dam for the first time since its construction in the 1950s. Complementing the in-water features are streamside amenities, including boat access points, spectator seating, and paved trails connecting key areas. The whitewater park of the project is strategically positioned near the Interstate 68 exit ramp. This strategic location not only promotes accessibility but also fosters greater integration with nearby businesses and local accommodations. The trails play a crucial role, weaving into the Greater Cumberland trail network along both Maryland and West Virginia riverbanks. With connections to the Towpath, a river trestle, and a tunnel, these trails offer diverse recreational opportunities. Building upon existing assets like Canal Place, Cumberland's infrastructure, and local businesses, the river park extends services, creating a dynamic space for recreation and supporting related businesses. This report delves into the detailed analysis and feasibility aspects, envisioning a future where the River Park at Canal Place is a thriving symbol of community vibrancy and natural beauty.

B. Project Scope

To further completion of the project, Recreation, Engineering, and Planning (REP) and Civil and Environmental Consultants, Inc. (CEC) were tasked with creating a 30% Preliminary Engineering Report and revised masterplan that will be necessary to determine and redefine the locations of the feature water drops and related land-based trails connections. To generate the 30% report and design, the following items are necessary:

- Existing site topographic base mapping, bathymetry upstream of dam, 3D modeling of dam and other in-water man-made features.
- Hydrology Analysis
- Hydraulic Model Review

- Floodplain Feasibility Analysis
- Pertinent project site and surround area connections data
- Meetings/Coordination with United States Army Corps of Engineers (USACE), City of Cumberland, Canal Place, and Allegany County

2. SITE ANALYSIS

A. Existing Site Photographs

Existing Aviertt Street floodwall and Levee.
Proposed whitewater launch point.

View of Ridgely Flood control wall and Bridge Street Crossing.
Proposed trail intersection with Bridge Street.

Existing floodwall and dam on river left (Maryland).
Proposed location of trail underpass adjacent to feature whitewater drop.

Existing Interstate 68 Bridge parking lots on Greene Street.
Proposed area of shared use parking for the river park.

Existing Riverside Park includes National Road 0-mile marker, George Washington's Headquarters. Proposed location of parking lot access for take-out location for whitewater park and the relocation of George Washington's Headquarters to the point of the Riverside Park.

Existing Pedestrian Bridge with stairs and ADA access from Station to Riverside Park. Proposed connection point to Western Scenic Railroad Parking lot and Chesapeake & Ohio Bike Trail.

Existing flood wall River Left (Maryland side) downstream of railroad trestle. Proposed area for overlook and stair access to river trails.

Existing overlook connected to the C&O Bike Trail. Proposed ADA access ramp to riverside trails.

Existing gravel access to overhead electric lines on WV-28 Veteran's Memorial Highway. Proposed asphalt turnaround with parking for downstream of whitewater park boat launch points and access to the trail network from the Ridgeley, WV side of the North Branch of the Potomac River.

Existing shared use gravel parking area adjacent to WV-28. Proposed shared use parking for use for downstream of whitewater park boat launch points and access to the trail network from the Ridgeley, WV side of the North Branch of the Potomac River.

B. Site Opportunities & Constraints

1. Opportunities

1. Economic Development:
The incorporation of new biking and hiking trails, fishing habitats, whitewater features, and observation areas within the project area is a significant expansion of recreational opportunities, reunifying both cities (Cumberland, Maryland and Ridgeley, West Virginia) through their use of the river, providing an easy escape to the natural environment within the confines of an up-and-coming city built upon the rich history of its past and is a one-of-a-kind opportunity for the region that will produce continued economic growth and development.

2. Historic Features and Tourism:
Building on the existing success of the C&O Canal Towpath, National Historic Park, the National Road, and the Downtown Cumberland Historic district, the River Park at Canal Place is strategically positioned to draw from the rich historical tapestry of the region, offering visitors a distinctive and educational experience. The project's adjacency to key attractions, including the Great Allegheny Passage Trail, Chesapeake and Ohio Canal Trail, Knobley Tunnel, Western Maryland Scenic Railroad, Canal Place businesses and event space, and the historic canal, creates a compelling foundation for recreational and tourism development.

3. Innovative Whitewater Features:
The proposed whitewater park which includes concrete and boulder features to create a unique manmade whitewater rapid structure that offers a distinctive recreational experience, attracting a broad spectrum of users, from novices to advanced enthusiasts. Intertwining riverside trails that bring spectators right next to the whitewater action and provide access to passive seating areas on nearby hillsides providing multiple interaction points.

4. Trail Network Integration:
The comprehensive trail network provides opportunities for exploration, connecting to existing trails like the Towpath and GAP Trail and introducing users to unique features such as the whitewater area, Knobley Tunnel, and railroad trestle. The trail networks will create a series of loops of varying length for users to create their own trail network that best fits their timeframe for a quick or longer ride, while enjoying different views for the extent of their ride back to their starting point.

5. Adaptive Reuse of the Dam:
Turning the once-perceived dam obstruction into a recreational opportunity exemplifies adaptive reuse. Although removed, the whitewater feature drops will continue to play a crucial role in the success of the Canal Re-watering Project. Additionally, the integration of fish passage routes through the dam will

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grant various fish species access upstream for the first time since its construction in the 1950s.

2. <u>Constraints</u>

1. Sediment Contamination:
Historical studies indicate sediment contamination, specifically dioxins, behind the dam, necessitating careful consideration and involvement of regulatory authorities like Maryland Department of the Environment (MDE).

2. Historical Building Relocation:
The relocation of George Washington's Headquarters is suggested due to its lack of significant historical value in the current location, introducing potential challenges in finding a suitable and historically appropriate site.

3. Infrastructure Adaptation:
The proposed changes to the dam and adjacent areas necessitate careful planning to ensure the integration of new and existing infrastructure, including existing Combined Sewer Overflows (CSO), proposed extension and capacity of CSO to the North Branch of the Potomac River, and other potential interactions that may come from project construction.

4. Site Morphology:
The elevation changes and natural morphology of the site need to be considered in the design process to ensure the safety and accessibility of the proposed features including the connection to upland and riverside ADA accessibility options and trail designs.

5. Regulatory Approvals:
The project requires compliance with various regulatory requirements, including permits, zoning regulations, and legal considerations, which may pose challenges in terms of timelines and a lengthy approval process for construction.

6. Historic Preservation:
Balancing the need for progress with the preservation of historic sites and structures requires a nuanced approach to ensure the cultural integrity of the region is maintained or accentuated.

7. Public Safety:
The inclusion of in-water features, particularly whitewater features, necessitates careful design to ensure public safety, especially for users with varying skill levels.

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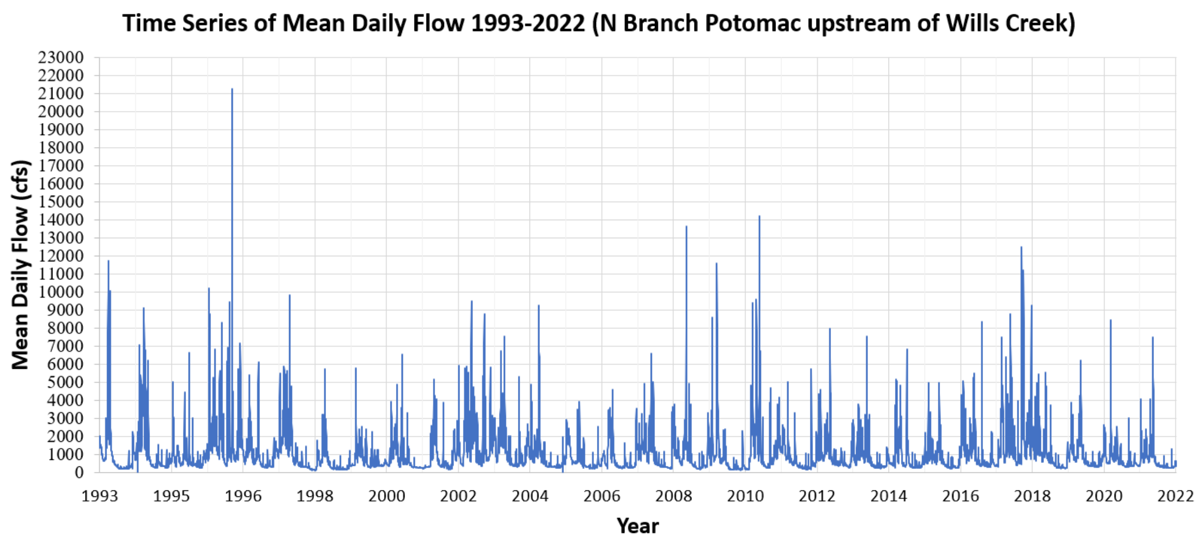
C. Hydrology

The availability and timing of flow is one of the most important factors in the performance and function of a river park, and a key factor in design. The North Branch of the Potomac River in Cumberland is a relatively large river with discharges that vary dramatically throughout the year. The character of the park will change with various flows, but generally there is enough flow to provide for quality river recreation features throughout the year. Many popular river parks have similar flow regimes, designed to function down to 300 cubic feet per second (cfs) or even less. These same features can be designed to also function well at higher flows with increased performance for advanced paddlers and surfers.

River discharge data was downloaded from the publicly available USGS gage station 01603000, North Branch Potomac River Near Cumberland MD, located near the Canal Parkway bridge a little over 2 miles downstream of the project site. At the downstream end of the project area is the confluence with Wills Creek, which contributes significant flow to the river. Discharge data from Wills Creek was downloaded from USGS gage station 01601500. In order to estimate the flow in the North Branch Potomac upstream of the confluence, flow data from Wills Creek was subtracted from the North Branch Potomac gage data to create a time series of flow data for the North Branch Potomac upstream of Wills Creek.

For the purposes of this study, REP analyzed the average daily discharge for 30 full calendar years, 1993 through 2022. This provides a relatively large sample of data from the modern watershed. Older discharge data may not accurately reflect current watershed dynamics due to development, increase in impervious surface area, and other factors.

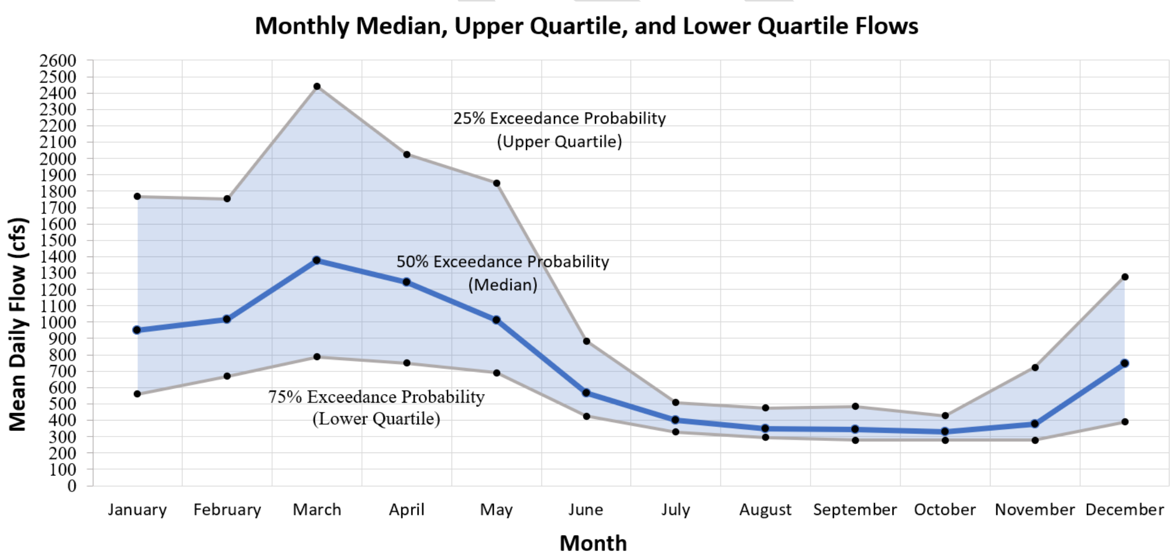


Mean daily flow time series for the 30 calendar years analyzed (1993-2022) for the North Branch Potomac upstream of Wills Creek. The river typically flows between 300 and 3,000 cfs, though high flow events have occurred ranging from over 10,000 cfs to over 20,000 cfs.

The complete time series of the daily flow data for the last 30 full calendar years is shown above. Flows in the river can vary dramatically from year to year, depending on precipitation and snowmelt. Generally, flows are higher in the winter and spring months (January – May) and lower in the summer and fall (July – October). However, high flows can occur at any time of the year as evidenced by the highest flow recorded on September 7, 1996. On that date, the flow peaked at 21,230 cfs, the highest flow calculated for the North Branch of the Potomac upstream of the confluence with Wills Creek.

Exceedance probabilities offer a valuable method for determining typical flows and were computed for every calendar month. The 75% exceedance probability (lower quartile flow) represents the flow that surpasses 75% of the recorded daily flows in that month. Similarly, the 50% exceedance probability (median flow) is the flow eclipsed by 50% of the recorded daily flows, while the 25% exceedance probability (upper quartile flow) denotes the flow exceeded by 25% of the recorded daily flows in that month.

The accompanying plot illustrates these flows for each month, connecting the median flow with a blue line and shading the area between the upper and lower quartile flows in light blue. This shaded region encapsulates the middle 50% of recorded flows for each month, offering a reliable indicator of the typical flow range anticipated throughout the year.



Monthly median, upper quartile, and lower quartile daily flows calculated for each month of the year based on mean daily flow data from 1993-2022, based on the calculated flows in the North Branch Potomac River upstream of the confluence with Wills Creek.

The median flows for February through May are all above 1,000 cfs, while the median flows for July through November are all below 400 cfs. A table summarizing the monthly statistics developed is shown on the following page. The month where the minimum daily flow was recorded is January (20 cfs), although this month has also recorded high flows up to 10,200 cfs. This demonstrates the annual variability in flows depending on the storm cycles that move through the watershed.

Table 1. Monthly statistics calculated from mean daily flow data from 1993-2022 for the North Branch Potomac River upstream of the confluence with Wills Creek

Month	Exceedance Probability			Minimum	Maximum
	50% (Median)	25% (Upper Quartile)	75% (Lower Quartile)		
January	951	1768	560	20	10200
February	1016	1755	668	187	7510
March	1378	2440	789	283	11610
April	1245	2025	749	383	11750
May	1012	1851	691	324	14190
June	565	884	424	237	6850
July	398	507	329	173	8377
August	350	475	295	175	9464
September	345	485	279	161	21230
October	331	428	278	172	5740
November	376	723	279	50	5810
December	746	1278	390	140	9260

Numerous established river parks with comparable flow patterns have achieved success. Leveraging the expected flow conditions, the proposed enhancements for river recreation can be tailored to perform effectively throughout a significant portion of the average year. In the winter and spring, characterized by higher flows, the project can be configured to offer accessible whitewater suitable for everyone from beginners to advanced paddlers. As the flow decreases in the summer and early fall, the river features may be less enticing for advanced users, but the same structures can be designed to accommodate tubing, boat passage, and novice whitewater activities. Riverside recreation, encompassing activities such as fishing, strolling, picnicking, biking, splashing, and wading, will be available year-round. The project is intended to facilitate fish passage at all expected flows while creating a habitat for aquatic species.

D. Floodplain Feasibility Analysis

The floodplain feasibility study work has not been performed, as the necessary existing hydraulic models of record have not yet been received from the US Army Corps of Engineers (USACE). The necessary information has been requested through a Freedom of Information Act (FOIA) request.

Floodplain and flood flow conveyance are important considerations for this location on the North Branch Potomac River (and Wills Creek) in Cumberland. Levees, floodwalls and other flood flow conveyance infrastructure exist at the site and trails have been constructed atop areas of flood protection infrastructure. The floodplain feasibility analysis will ensure the proposed project can be built without causing adverse impacts to the regulatory floodplain.

A preliminary level proposed conditions hydraulic model will be created to represent the Industrial Dam modification and river recreation park concept, and water surface elevation results will be compared to the effective model for the reach. Model results will determine if the proposed project can be implemented without adverse impacts to the floodplain. To conduct the formal floodplain analysis necessary for permitting, further topographic / bathymetric survey will be required, and the design will need to be progressed to at least the 60% design level.

E. Dam Structural Analysis

Based on a review of the available record drawings (See appendix section for drawings and figures), it appears that the bridge pier and abutments were not designed to have connection to the dam. The construction drawings do not indicate a positive connection between the two structures (e.g., steel dowels or other reinforcing steel configurations). Instead, the two structures were to be separated by an expansion joint (filled with ¾" premolded expansion joint material). A 9" wide, vertically oriented waterstop was also included at the joint to minimize water infiltration through the joint.

Although it is not possible to verify that the design of the piers and abutments accounted for the location of the dam "infill" for any lateral stability without reviewing the original calculations (which are not available), given the construction means and the intentional expansion joint between the structures, it is unlikely that it was considered. In order to construct the abutments and pier as designed, it would have been necessary to have constructed these structures prior to placement of the dam concrete. As such, the design would have been considered a period of time prior to and during the construction of the dam that those structures would have been without the lateral support of the dam or the bridge superstructure.

Therefore, it is our opinion that the removal of portions of the dam will not adversely affect the performance of the bridge piers and abutments. Removal of the concrete near the interface between the structures to remain should be demolished with means that will ensure that incidental impacts will not occur (e.g., cutting rather than hammering). Given that the concrete in the dam appears to have been designed with some reinforcing steel, cutting of the concrete is the recommended approach.

Since the available record drawings are labeled to be "as built", the discovery of connection between the dam and the pier or abutments is not anticipated. Nondestructive test methods (e.g., x-ray or ground penetrating radar) can be used prior to demolition to ensure such connections were not included. However, it is unlikely that such undocumented changes would have occurred in this case.

F. Aquatic Species

The Potomac Industrial Dam has a profound impact on historic migration corridors and spawning habitat. Dams and other manmade barriers have resulted in stream fragmentation limiting movement of resident fish and migrations of catadromous

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(migrate down rivers to the sea to spawn) and anadromous (migrate upstream of a river to spawn) species, including the American eel, to their historical spawning and nursery habitat. In turn, the dam likely limits the abundance and diversity of mussel species in the impounded zone behind the dam due to a lack of fish host and habitat impairments.

The Maryland Department of Natural Resources (MDNR) indicated that it has been assumed that mussels have long been extirpated or, if extant, few species remain, and they persist in very low numbers in the North Branch Potomac River (McCann, 2021).

The Potomac Industrial Dam has been identified as a high priority blockage for resident fish species and a moderate priority blockage for catadromous and anadromous species. Though there are six downstream barriers from the Potomac Industrial Dam, with one having a fish ladder and another being notched, the American eel has been documented downstream of the Potomac Industrial Dam but not upstream. According to the MDNR, the section of the North Branch Potomac River from Westernport downstream to Pinto remains cold and suitable for trout management (MDNR, n.d.). The impounded zone behind the Potomac Industrial Dam is likely impeding the trout population in this reach.

G. Construction Feasibility

In-river construction presents a set of unique challenges. Based on extensive experience designing and overseeing many similar river projects throughout the country, the design team believes the proposed project is constructable in a manner that can minimize the impact to the river. Detailed phasing and water control plans will be developed in future project phases and will change as the design progresses, but the overall approach will include:

- Placement of temporary cofferdams to isolate work areas. The existing dam may be used temporarily as a cofferdam. Pump water to dewater the work area.
- Allow space for river flow to pass around the isolated construction areas. Working in a single channel river such as this, the drop structures will need to be constructed in phases, with a portion constructed in the dry and then the river "flipped" with flow passing over the recently constructed portion while the rest of the structure work area is dewatered.
- Turbidity curtains, care of water area, and other best management practices (BMPs) designed to limit excess turbidity in the river.

H. Sedimentation Analysis

The Potomac Industrial Dam has interrupted the North Branch Potomac River's natural sediment transport process resulting in sediment accumulation in the impounded zone behind the dam. Princeton Hydro estimated the impoundment to be approximately 1.9 miles long with an estimated accumulated sediment volume of 142,000 cubic yards (Wildman, 2010, reported in Van Ryswick and Sylvia 2015). The dam was constructed to supply water to local industry; however, this past industrial activity created concerns regarding the chemical and physical properties of the accumulated sediment, leading stakeholders to sample and analyze the sediment for contaminants.

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As part of a feasibility study for removal of the Potomac Industrial Dam, Princeton Hydro collected three surficial sediment samples within the impounded zone behind the dam in 2009. The results of these sediment samples showed the presence of low levels of dioxin and dioxin-like compounds in surficial sediments in the impoundment. Due to the results of this study, American Rivers contracted the Maryland Geological Survey (MGS) to perform a more detailed sediment study within the impounded zone of the dam to determine the physical and chemical properties of the sediment and the areal extent and depth of dioxins and metals in the sediment (Van Ryswick and Sylvia 2015). MGS collected 10 sediment core samples, ranging from 1 to 3.4 meters deep, from the upstream impoundment area. Various depth intervals were analyzed for grain size, elemental concentration, extractable metals, and dioxins.

The following summarizes the findings of the study:

1. Upper sediments that accumulated after construction of the dam predominantly consist of gravelly sands. Fine muddy sand and mud sediments have accumulated in low energy areas close to the shore and along river left just above the dam. Gravel and cobbles increase in the deeper sediments, indicative of the pre-dam high energy streambed.

2. Total elemental concentrations in the sediments are within the ranges of other dam impoundment sediments from similar settings.

3. Toxicity characteristic leaching procedure (TCLP) analyses for extractable hazardous metals were run on the finer sediments at various intervals in the cores indicative of post-dam deposition. MGS found that the TCLP metals concentrations were either below the detection limit or well below hazardous metal threshold concentrations; therefore, MGS concluded that there were no concerns associated with TCLP metals in the sediments within the impounded zone.

4. The sediments were analyzed for a suite of dioxin compounds. Since the toxicity of individual dioxins varies by orders of magnitude but have a similar mode of action, the concentration and toxicity of individual dioxins were standardized to the most toxic dioxin, 2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) and presented as the Toxicity Equivalent (TEQ) dioxin concentration. Dioxins were found in all the sediment samples, with lower concentrations in coarser sand and gravelly sand sediments and higher concentrations in finer grained mud and organic sediments. Dioxin levels generally decreased in the pre-dam sediments dominated by gravelly sands and cobbles. Dioxins concentrations were generally lower farther upriver from the dam except in Core 8, which was taken in a finer sediment accumulated near the river right bank edge.

5. The TEQ dioxin concentrations in the sand and gravelly sand samples were below or just above the level of low risk to sensitive mammalian wildlife. The TEQ dioxin concentrations were highest in the very muddy sediments of Core 2 along

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the left bank just above the dam, where two samples contained TEQ values above the EPA level of high risk for sensitive avian wildlife.

I. Canal Water Intake Analysis

The existing canal water intake system is a necessary component of the Canal Rewatering Project. Currently, the first 0.25 miles of the proposed 1.20-mile canal reconstruction has been completed. The water intake system as constructed was designed to meet the rewatering requirements of the 1.20 miles of canal reconstruction. As the project stands as of this report, the required water for rewatering the canal is only needed as makeup water for water lost out of the canal. The capacity required for the total 1.20 miles is 8 cubic feet per second or approximately 3,600 gallons per minute.

There is an intake screen structure located in the reservoir formed by the Corps Dam at an elevation of 606.25 feet mean sea level (MSL). The water flows via gravity through a 24-inch water line into a sluice gate to the wet well of the pumping station. Two 75 HP submersible pumps move water through two 10-inch discharge pipes, below the pedestrian bridge to the can turning basin. A float switch cluster is located near the canal in a stilling structure that controls the pumps by allowing them to come on and off at various water levels.

When the dam is removed, the water level at the existing intake location may fall below required levels. Modifications/relocations will need to be made to the intake to ensure proper water levels if/when the Canal Project extends to the proposed 1.20 miles. The design options are shown in the preliminary design section of this document.

J. Combined Sewer Overflow (CSO) Outlet Structure

The proposed future construction of an upgraded larger CSO structure (a part of the Canal Re-watering Project) downstream of the proposed whitewater park has been coordinated with the design and intent of this 30% Preliminary Engineering Report, however continued coordination may be necessary as both projects mature towards construction.

K. Upland Analysis

Parking

Greene Street Interstate 68 Bridge Underpass – Below the Interstate 68 Bridge (Clarysville Bridge), includes three distinct asphalt paved parking lots between S Johnson Street and Bridge Street Intersections. Parking areas nearest to the S Johnson Street intersection and Bridge Street intersection are shared use parking for businesses on both sides of Greene Street. The middle parking lot is a metered public parking lot (Parking Lot #3) and is the designated parking lot for the National Road Monument and George Washington Headquarters.

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South Mechanic Street – Two asphalt public parking lots with striping serve the public. One adjacent to the Western Maryland Scenic Railroad Station/ and Canal Place Heritage Area and one below the Interstate 68 bridge at the intersection of Howard Street and South Mechanic Street. Both parking lots serve as overnight/long-term parking for users of the GAP and C&O Trail systems as well as parking for the Shops at Canal Place and stage great lawn area. It also serves as additional parking for the Cumberland Pedestrian Mall and greater downtown area.

Route 28 (Veterans Memorial Highway), WV- Blocker Street Utility Road – At the end of Blocker Street located near the railroad trestle serves as an existing access point for u

Route 28 (Veterans Memorial Highway), WV – A gravel overflow area serves as additional overflow parking directly across from a small business plaza currently housing Chef Paul's Kitchen & Catering, My Place, and J&B's Quick Stop Drive Thru. Adjacent to the overflow parking area is a car dealership, Nelson Auto Sales. The gravel lot can hold approximately 20-25 vehicles.

River Access

There are multiple launch ramps for boating along the North Branch of the Potomac River upstream and downstream from the industrial dam. Unfortunately, the inability to pass through Cumberland's industrial dam has been a stumbling block for long distance river trails. With the removal of the industrial dam, a user could now paddle from Jennings Randolph Lake near Westernport, Maryland 147 miles to Sharpsburg, Maryland. Providing an expanded user group to lodge and board in Cumberland as they make their excursion down the Potomac River Water Trail.

Local area launch ramps docks and ramps are located below:

Alleghany County Fairgrounds Boat Ramp
Location: Lat: 39.607549 Long: -78.803939
Miles to downstream launch/take-out point: 2.70 miles
↓
Upper Potomac Industrial Park Boat Launch
Location: Lat: 39.634237 Long; -78.797227
Miles to downstream launch/take-out point: 2.15 miles
↓
Whitewater Park Launch
Location: Lat: 39.647570 Long: -78.768506
Miles to downstream launch/take-out point: 0.30 miles
↓
Whitewater Park Take-out
Location: Lat: 39.648074 Long: -78.764786
Miles to downstream launch/take-out point: 0.20 miles
↓
Canal Place Stage Launch

Location: Lat: 39.645972 Long: -78.764318
Miles to downstream launch/take-out point: 2.72 miles
↓
Mason recreation Boat Ramp
Location: Lat: 39.619571 Long: -78.762443

ADA Accessibility

ADA accessibility from the Western Scenic Railroad Station to Howard Street is carefully planned for seamless inclusivity. Originating at the ADA parking lots near the GAP/C&O Trailhead Junction, a wide ADA ramp encircles the Canal Park Stage, extending to a pedestrian bridge over the canal and an overlook along the Chesapeake and Ohio Bike Trail. Access to Riverside Park is facilitated by an ADA ramp from the south side of the Railroad Station building, connecting to the train station platform. The platform features an ADA crosswalk for safe passage over train tracks, leading to an additional ADA ramp connected to the pedestrian bridge. This strategic design ensures uninterrupted and barrier-free access, prioritizing the diverse mobility needs of individuals from Howard Street to the Western Scenic Railroad Station and to future planning endeavors along the North Branch of the Potomac.

Trail Connections

The junction of the Great Allegheny Passage (GAP) Trail and Chesapeake and Ohio Canal (C&O) Towpath Trail in Cumberland, Maryland, serves as a pivotal point for economic development. This convergence transforms Cumberland into a thriving tourist hub, attracting outdoor enthusiasts and bikers. The city strategically provides amenities such as bike rentals, accommodations, and restaurants to cater to trail users, fostering business growth. Cumberland's historical significance is heightened as it marks the transition from the industrial C&O Canal to the scenic GAP Trail. The economic impact is evident in increased patronage for local businesses, job creation, community engagement, and infrastructure investment. Overall, the trail junction enhances Cumberland's appeal, showcasing a successful model of economic development driven by outdoor recreation and cultural exploration.

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3. PRELIMINARY DESIGN IMPLEMENTATION

A. Whitewater Park Design

A whitewater park on the Arkansas River in Salida, CO. The park is utilized by a wide range of people and abilities and has been credited with driving significant economic growth.

<u>IN-WATER DESIGN:</u> In the proposed river recreation park's water design, the intricacies of each instream recreational drop structure are meticulously planned to offer a dynamic and engaging experience for a broad spectrum of users. The natural stone boulders, with a minimum diameter of 3 feet, are strategically arranged and anchored to the riverbed where necessary, ensuring stability during varying flow rates. The variability in dry drop (1.5 to 3 feet) caters to users of different skill levels, making the park accessible to both beginners and advanced enthusiasts. The upstream-most drop structure, designed to mirror the water surface elevation of the existing dam, serves as a key element in maintaining consistency and preserving the impoundment created by the Industrial Dam.

A beginner kayaker descends a recreational drop structure in San Marcos, Texas designed by REP. These structures perform together with, and are anchored to a defunct mill dam, a common site scenario and opportunity for river recreation.

A casual river surf scene at a dam modification project in Dayton, Ohio. This surf structure shown is anchored directly to a defunct low-head dam.

The incorporation of fish passage channels at each drop structure demonstrates a commitment to ecological considerations. The un-grouted natural stone channels, specifically designed for low-flow conditions, aim to facilitate the movement of target fish species across the park. The pools between the drop structures not only provide a visually appealing cascade effect but also ensure a well-thought-out recovery time, contributing to the safety and enjoyment of users. The stone bank terracing further enhances the aesthetics of the water design, creating areas of focus for spectators and users alike.

Stone terracing and river access at a dam modification project in Calgary, Alberta.

Riverside Design: The riverside design of the park intricately weaves together accessibility, safety, and environmental sensitivity. The ADA accessible trails, constructed with durable riverside concrete, offer users the opportunity to traverse the length of the project seamlessly. The deliberate positioning of the trails close to the river's edge provides not only scenic views but also enhances user experience, allowing them to feel connected to the water throughout their journey. Trail underpasses at the existing "Blue Bridge" roadway bridge ensure a continuous and uninterrupted path for users.

The flood-resistant design of the trails acknowledges the dynamic nature of the river, accommodating potential inundation during high flows. Multiple ADA accessible river access points, strategically placed upstream and downstream, serve as pivotal entry and exit points for various water activities, fostering a sense of convenience and inclusivity. Stone river access steps, seamlessly integrated into the stone bank terracing, add an aesthetic touch while providing functional access to the water's edge. The emphasis on preserving existing infrastructure not only ensures continuity with the surrounding environment but also minimizes the project's ecological footprint. This comprehensive riverside design is a testament to the project's commitment to creating a harmonious and sustainable river recreation park.

B. Upland Design

All the site areas outside of the immediate water course are included in the upland design. Proposed structure and design elements including parking facilities, trail heads, trails, seating areas, viewing areas, historical features, fishing access and connections to existing infrastructure are a part of this section.

Trail System: Expanding on the achievements of the C&O Canal and the Great Allegheny Passage Trail Systems, the proposed upland trail network aims to establish connections with national, regional, and local trail systems. Nationally, it integrates with the C&O and Great Allegheny Passage trail systems, while regionally, it connects to Carpendale, WV, the presently closed Knobley Tunnel, and potential future rails to trails connections. At the local level, the 1.9-mile Maryland loop trail offers wetland paths and fishing access points along the river. The system includes larger loop trails with smaller loops, providing diverse experiences and scenic views. This integrated trail system is

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designed to facilitate the reconnection of cities with their waterfronts, a prospect not realized for generations.

Parking: There are four proposed parking facilities providing river and trail access. They are integrated into the city's fabric and are multi-use facilities.

Greene Street Interstate 68 Bridge Underpass – Below the Interstate 68 Bridge (Clarysville Bridge), includes three distinct asphalt paved parking lots between S Johnson Street and Bridge Street Intersections. Parking areas nearest to the S Johnson Street intersection and Bridge Street intersection are shared use parking for businesses on both sides of Greene Street. The middle parking lot is a metered public parking lot (Parking Lot #3) and is the designated parking lot for the National Road Monument and George Washington Headquarters. It is anticipated that this will be additional parking for guests and users of the whitewater park and trails.

South Mechanic Street – Two asphalt public parking lots with striping serve the public. One adjacent to the Western Maryland Scenic Railroad Station/ and Canal Place Heritage Area and one below the Interstate 68 bridge at the intersection of Howard Street and South Mechanic Street. Both parking lots serve as overnight/long-term parking for users of the GAP and C&O Trail systems as well as parking for the Shops at Canal Place and stage great lawn area. It also serves as additional parking for the Cumberland Pedestrian Mall and greater downtown area. It is anticipated that users of the whitewater park and trail system will utilized this areas for parking.

Blocker Street parking facility and emergency access-. Located on the Ridgely, WV side of the river, this existing access point could be expanded and developed into a 7-space trail head providing parking, emergency access, and ADA accessibility to the river.

WV-28 Shared use river access point. This existing gravel lot off WV-28 along the levee in Ridgely, WV can provide river access to boaters and ADA access to hikers and fishermen.

River Left North Branch of Potomac River

Whitewater Launch Trailhead: Includes the Avirett Avenue trail linkages and boater access to the whitewater park launch area. This trail head provides access to the top of the levee trail, the river side trail, and the boat launch area.

Top of the Levee Trail- This trail follows the existing levee creating a strong connection along the entire length of the whitewater park linking the launch area and the takeout area with multiple access points into the city and down to the riverfront. The trail offers outstanding views of the river, city, and surrounding countryside. In addition, the trail is almost entirely ADA compliant.

Riverside Trail: The riverside trail system provides direct access to the waterfront linking the beach, viewing, and seating areas along the riverfront. There are three access

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points down to the riverfront, however the middle access point allows for ADA accessibility to the riverfront.

Connections to Existing Pedestrian Systems: Where the top of the levee trail crosses the blue bridge, there is a proposed crosswalk providing a strong sidewalk connection into the city.

Blue Bridge Underpass: As the riverside trail passes under the blue bridge, an outstanding environment is created. Focused on the largest drop in the water park and bringing the trail close to the rushing water, letting bystanders experience the sound and feel the rushing water in close connection to whitewater enthusiasts.

Terraced Rock Seating Area: Located in a natural bowl focused on the last two feature water drops in the water park, this feature provides the ideal viewing area of the park.

Whitewater Park Take Out Area: The takeout is located at the end of the whitewater park, providing a calm area to take out. It also provides access along the levee wall to the top of the levee trail, providing direct access to the launch area, relocated Washington's headquarters and connections into town via the pedestrian bridge to canal place or road connections via Greene Street.

Proposed Observation Platform and Stairway: The proposed viewing platform will be located on an existing foundation structure and will provide panoramic views of the river, city and, countryside while the stairway will also provide access to the riverfront.

Proposed ADA Ramp for River Access: Located adjacent to the existing observation platform this ramp will provide water access.

Waterfront Trail: The waterfront trail provides ADA access to beaches, hiking, and fishing opportunities along the calmer portion of the river.

Creating Fishing Opportunities Around River Deflectors: Along the waterfront trail access, fishing areas are created in and around the diversion structures, providing great eddies and low current for fish to congregate as they move up and downstream.

Connection to the Maryland Loop Trail: This 1.9-mile trail explores wetlands and river environments down river and be able to loop back to the beginning of the trail.

River Right North Branch of Potomac River

Proposed expansion of the waterfront trail upriver to Carpendale, WV, includes a trail connection in Ridgely, WV, at the blue bridge. This involves establishing a crosswalk and sidewalk connections to link the town with the riverfront. Specific features of the plan include:

Blue Bridge Underpass on WV Side: Details regarding the underpass at the Blue Bridge on the West Virginia side.

Trestle Bridge Underpass: The walkway provides trail users to access upstream and downstream of the whitewater park without the interaction of pedestrians and the active railroad line. Occasionally, a user may be fortunate enough to be below the trestle when a train rumbles across overhead.

Emergency Access ADA Parking and Access: A secondary location for users to park and access the riverfront trails from WV-28 and used for emergency access as needed.

Boat Launch Access on WV-28: The inclusion of a boat launch access point from WV-28 will provide water enthusiasts to access the calmer portions of the river and allow a gentle ½ day float trip to the Mason boat Launch take out.

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Waterfront Trail: The main waterfront trail facilitating activities such as viewing, hiking, fishing, and access to beaches along the waterfront.
Connection to Trestle Loop Trail Downriver: Establishing a connection to the Trestle Loop Trail downstream.

C. Water Intake Design Options

The following options to be examined prior to the dam's removal:

- A slip stream constructed on the side of the river below trail surface to provide necessary depth to cover intake screen.
- Intake screen to be relocated upstream before the first feature drop, anchored into the designs of the feature's wingwalls.
- Water intake location to remain in place, but installation of a smaller pipeline within the 24-inch pipeline to be pumped rather than gravity fed.

D. Sediment Dredging/Passive Release Design Options

Sediment Dredging Option: Following permit approvals, the first step of project implementation will be to mobilize equipment for the installation of MDE-approved erosion and sediment control measures and best management practices. Existing high value natural resources located in the work area will be demarcated to avoid unanticipated disturbances. Given the setting of the Bank, multiple ingress and egress locations exist that could be utilized to mobilize equipment. A mobile dredger will be brought in to begin the process of excavating deposited sediment from the reservoir behind the dam to prevent the release of contaminated sediment to the downstream channel. The removal of accumulated sediment will be planned and executed with approaches that will mitigate deleterious effects on aquatic life. The dredging program including the type of dredge, rating of pumps, location, and depth from which the sediment is to be removed, will need to be determined. It is anticipated that the dredging activity will generate approximately 142,000 cubic yards of waste requiring disposal. The disposal of the dredged material will be conducted in compliance with federal, state, and local government laws and regulations.

Passive Sediment Release Option: To avoid undue harm during dam removal, deconstruction will be undertaken in careful steps to not only avoid downstream degradation but also to maintain public safety and the structural integrity of the Blue Bridge, which is co-located with the dam. Though it has been determined that the bridge and dam are not structurally connected, the decommissioning will be completed in coordination with the State Highways Administration.

The project will involve dam removal to allow certain structures to remain in place, without reservoir impoundment or hazards to the Blue Bridge or recreational boaters. The dam will be removed as stated in the design section of this document, while leaving the center pier for the bridge in place. The pier will be stabilized, along with the streambed within the footprint of the former dam, to provide a suitable hydraulic section for velocity control and fish passage.

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Removing the dam will generate short-term, temporary geomorphic disturbances during the passive release of the remaining sediments from the impoundment. Shifts in patterns of sediment movement can be a prominent ecological response to dam removal and these changes in transport control the process of channel evolution, which can also have important consequences for biogeochemical cycling. Additional modeling will need to be completed to determine the channel evolution and associated rates of sediment delivery.

Per the following case study. the Bloede Dam Biogeochemical Impacts Analysis Report (Boynton, et. al., 2014), which assessed phosphorus inputs to the ecosystem associated with sediment release from removal of the Bloede Dam. This analysis assessed how particulate phosphorus would interact with the estuarine segments of the Patapsco River, with the most basic distinction being between inputs of total particulate phosphorus and inputs of particulate phosphorus forms that could be converted into forms that could grow algae. The analysis concluded that there would be a reasonable expectation that release of sediment from the Bloede Dam could result in 1) the deposition of inorganic phosphorus in sediments of the tidal Patapsco River and that 2) under saline, and especially low oxygen conditions, a portion of that phosphorus could become bio-available for the growth of algae (Boynton, et. al., 2014). However, it is important to note that these release rates were related to the area of deposition; if the area of deposition of fine-grained material were spread out over the whole tidal Patapsco, then the releases would be aerially moderate. Ultimately the study concluded that a significant phosphorus release was not anticipated. Based on this study and the anticipated removal of sediment from the impounded zone behind the dam, it is anticipated that the same discountable phosphorus release will be associated with the Potomac Industrial Dam.

Low-head dams not only affect the downstream sediment supply and biogeochemical cycling processes, but they also have potential implications associated with flooding. These effects associated with the removal of a low-head dam can include both direct effects associated with changes in riverine hydrology and indirect effects related to potential changes in river morphology. The Potomac Industrial Dam does not provide a flood control function and the deleterious effects of its removal on flooding will likely be minimal. The accumulated sediment in the impounded zone decreases the reservoirs' ability to store floodwater and its removal is anticipated to result in reduced flood elevations upstream due to the loss of backwater effects. Indirect effects of low-head dam removal are generally associated with changes in river morphology, which could result in increased flood elevations associated with a sediment release that exceeds the channel's conveyance capacity.

4. CONCLUSION & NEXT PHASES

Based on the assessment described in this report, a river recreation park at the site of the Industrial Dam is feasible from a technical perspective (pending the floodplain feasibility analysis), as shown in the preliminary design developed.

To progress into the detailed design phase, additional data will need to be collected including additional topographic and bathymetric survey, water level logger install and

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data analysis, and a sediment assessment. It is recommended that this additional data collection is scheduled in late summer / fall 2024 while flows in the river are low.

Below is a summary of the next technical steps required to bring the design through 60% design and regulatory permit application submittals:

Topographical Survey: Additional surveying including a detailed bathymetric survey will be necessary beyond what has been collected to date.

Water Level Loggers: Installation of water level loggers at multiple locations in the project vicinity to record water surface elevations. It is important this task occurs during low flows prior to the next high flow season, as the water surface elevation data collected is needed for the full range of flows from low to high. This data is used for calibration of the design hydraulic model and needs to be collected prior to detailed design hydraulic modeling.

Sediment Assessment: An assessment of the impounded sediment upstream of the dam will be necessary to advance the design. The sediment assessment would entail rod probing to refusal throughout the sediment assessment area to estimate sediment depths, sediment type, and underlying material characteristics. Sediment sampling for contaminants can occur during the same investigation.

60% Design Plans: Advance the preliminary design plans to 60%. The 60% plans will include sufficient detail to be used for permit applications. The plans will include detailed cross sections and profiles, materials, construction access / dewatering details, etc. Development of the 60% design plans will run concurrently with hydraulic modeling tasks, stakeholder meetings, etc.

Floodplain Impact Hydraulic Modeling: Floodplain hydraulic analysis of project elements in the 60% design, building upon the floodplain feasibility analysis. Develop a floodplain impact report detailing the hydraulic analysis performed, and any floodplain impacts as a result of the proposed project. If the proposed design meets the requirements for no-rise certification, one will be provided. It will be necessary to develop a proposed conditions hydraulic model and analyze the 1% annual exceedance probability discharge (100-yr flood) water surface elevations for existing and proposed conditions, and associated change. The design team will make grading changes or geometry modifications if there are adverse impacts to the floodplain due to the proposed improvements. The goal is to design the project to meet no-rise requirements, and it is anticipated that several design iterations will be required.

Flood Control Impact Hydraulic Modeling: The HEC-RAS model will be used to determine if there will be any effects on the adjacent USACE Flood Control Project. The design team will make grading changes or geometry modifications if there are adverse flood control impacts due to the proposed improvements. Close coordination with USACE will be necessary. The model results will be used for USACE Section 408 permitting.

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Design Hydraulic Modeling: Advance the hydraulic model to be used for design support purposes. Analyze hydraulics and various design geometries to optimize the design for design flows. The design process will include iterations using the hydraulic model and the developed design surfaces to optimize the recreational channel features at all anticipated flows, inform material selection and embedment depths, etc. Water surface elevation data for a range of flows from low to high will need to be collected from the installed water level loggers prior to this task.

Permitting Agency Engagement, Coordination, and Meetings: The client and design team will need to engage with the various required regulatory agencies and meet with representatives throughout the 60% design process in order to work toward completing permit applications and supporting information. Anticipated required regulatory agencies include but are not limited to:

- City of Cumberland, MD
- City of Ridgeley, WV
- United States Army Corps of Engineers
- National Park Service
- Maryland Departments of Environment
- United States Wildlife and Fisheries
- Maryland Department of Transportation
- Maryland Historical Trust

Permit Applications: Preparation and submittal of necessary major permit applications to the various regulatory entities governing the work involved in this project. Necessary information includes quantities, areas of impact, design plans, required hydraulic modeling reports, etc.

Additional Work Items: Further phases of work include additional regulatory permitting effort required after initial application submittals, final design, bid documents development, the bid phase, and the construction phase.

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Preliminary Project Schedule: The schedule shown in the chart below is for planning purposes only, it is always anticipated that timeframes may change based on new information, permitting and data processes, and other potential situations that may delay the project.

Draft PER Delivery	1/24
Final PER Delivery	2/24
Draft Engineering Solicitation	3/24
River Sampling NTP (90 Days)	3/24
Bid Engineering Services	5/24
River Sampling Report	5/24
Engineering Proposals Received	6/24
Design/Permitting	12/25
Project Bidding	2/26
Contract Award	3/26
Construction Start	6/26
Construction Complete	11/27
Anticipated Opening to the Public	Spring 2028

Future Adjacent Work: The future projects described below will propel the region into a larger economically diverse area, providing a greater sense of community that is bound by its rich history while providing additional new attractions for visitors of the region, adding another cycle of rich history of growth to the region.

Canal Re-watering Project- The continued construction of the additional 1 mile of the canal near the event lawn and Canal Place Shops, will only add to the historic important significance of the canal for the city of Cumberland.

Knobley Tunnel – The reconstruction of the collapsed areas of the tunnel is prudent to the economic success of Carpendale, West Virginia. With the Tunnel repaired and opened to the public, users of the trail systems could then access Carpendale from a C&O Bike Trail trailhead that continues through the tunnel and North through the town of Carpendale and connecting with a future extension of the whitewater riverfront park trail downstream towards the town of Ridgeley. This trail holds significant importance to the town of Carpendale as the town could expand its tourism business outreach to users of trail systems looking for different trails and small-town experiences throughout the region.

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5. COST ESTIMATE

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Conceptual Level Preliminary Estimate of Probable Costs 12-Jan-24						
On-Grade Trail - Concrete Surface						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Trail A - 0.6 Miles (MD Side)	2800	SY	$150	$/	SY	$420,000
Ramp 1 (Near Overlook)	400	SY	$150	$/	SY	$60,000
Ramp 1 Landscape Wall	2100	SF	$125	$/	SF	$262,500
Ramp 2 (Near Dam)	260	SY	$150	$/	SY	$39,000
Ramp 2 Landscape Wall	1330	SF	$125	$/	SF	$166,250
Railing	160	LF	$125	$/	LF	$20,000
Steps	20	SY	$200	$/	SY	$4,000
Path From Pedestrian Bridge to Overlook	110	SY	$150	$/	SY	$16,500
Small Pedestrian Bridge	1	LS	$65,000	$/	LS	$65,000
					SUBTOTAL	*$1,053,250*
Event Terrace Area						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Concrete Sidewalk	3100	SY	$150	$/	SY	$465,000
Unclassified Excavation	1	LS	$150,000	$/	LS	$150,000
					SUBTOTAL	*$615,000*
Parking Lot						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Asphalt Surface	3900	SY	$60	$/	SY	$234,000
Concrete Sidewalk	320	SY	$150	$/	SY	$48,000
Concrete Curbing	500	LF	$75	$/	LF	$37,500
Storm System	1	LS	$180,000	$/	LS	$180,000
					SUBTOTAL	*$319,500*
Dam Modification, River Structures & River Access						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Water Control & Dewatering	1	LS	$800,000	$/	LS	$800,000
Dam Structure Demo & Removal	1800	CY	$200	$/	CY	$360,000
Embankment (Fill) for River Structures and Pools	42000	CY	$30	$/	CY	$1,260,000
Steel Sheet Pile	32000	SF	$90	$/	SF	$2,880,000
Structural Concrete Slabs at River Structures	400	CY	$380	$/	CY	$152,000
Structural Concrete Walls at River Structures	150	CY	$380	$/	CY	$57,000
Grouted Boulders at River Structures	6500	CY	$320	$/	CY	$2,080,000
Grouted Boulder Bank Terracing & Toe Boulders	5900	CY	$320	$/	CY	$1,888,000
Grouted Boulder Current Deflectors	450	CY	$320	$/	CY	$144,000
Ungrouted Riprap (6") Bedding Under Structures	6700	CY	$120	$/	CY	$804,000
Ungrouted Riprap (18") Scour Protection	6300	CY	$150	$/	CY	$945,000
River Boulders	42	EA	$1,600	$/	EA	$67,200

DESCRIPTION	QTY	UNIT	UNIT PRICE			COST
Access Steps	80	SY	$1,000	$/	SY	$80,000
Miscellaneous Equipment Hours	300	HR	$300	$/	HR	$90,000
Mobilization/Demobilization	1	LS	$400,000	$/	LS	$400,000
					SUBTOTAL	*$12,007,200*
Riverside Trails & ADA Access Paths						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Riprap Removal	2100	CY	$80	$/	CY	$168,000
Trail Grading	2200	CY	$30	$/	CY	$66,000
6" Reinforced Concrete Paths	4500	SY	$150	$/	SY	$675,000
Trail Subgrade	1500	CY	$120	$/	CY	$180,000
Ungrouted Boulder Terracing (Upland)	1200	CY	$250	$/	CY	$300,000
					SUBTOTAL	*$1,389,000*
On-Grade Trail - (West Virginia Side)						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Trail B - 0.6 Miles (WV Side Lower, Conc.)	2000	SY	$150	$/	SY	$300,000
Trail C - 1.4 Miles (WV Side Upper, Asphalt)	6700	SY	$60	$/	SY	$402,000
					SUBTOTAL	*$702,000*
Miscellaneous Items						
DESCRIPTION	**QTY**	**UNIT**	**UNIT PRICE**			**COST**
Beach Put Ins / Take Outs	4	EA	$35,000	$/	EA	$140,000
Overlooks C&O Trail	300	SY	$150	$/	SY	$45,000
Signal Adjustment	1	LS	$300,000	$/	LS	$300,000
Relocation of George Washington's Headquarters	1	LS	$100,000	$/	LS	$100,000
Sidewalk Demolition	350	SY	$40	$/	SY	$14,000
Grading (Overexcavation of On-Grade Trails)	12000	CY	$30	$/	CY	$360,000
Box Culvert (10' x 4')	300	LF	$2,000	$/	LF	$600,000
Water Intake Modification	1	EA	$1,000,000	$/	EA	$1,000,000
Contaminated Sediment Removal/Disposal	1	EA	$1,250,000	$/	EA	$1,250,000
					SUBTOTAL	*$3,809,000*
					TOTAL	$19,894,950
					CONTINGENCY 25%	$4,973,738
					Engineering Design, Permitting & Construction Inspection	$3,581,091
					PRELIMINARY GRAND TOTAL	**$28,449,779**
					SAY	**$28,500,000**

NOTES

1. Estimates are for planning/budgetary purposes only. Budgets must be updated during the design phases of the project.
2. This is a planning-level construction cost estimate based on conceptual plan dated 12/18/2023. No detailed design

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6. APPENDIX

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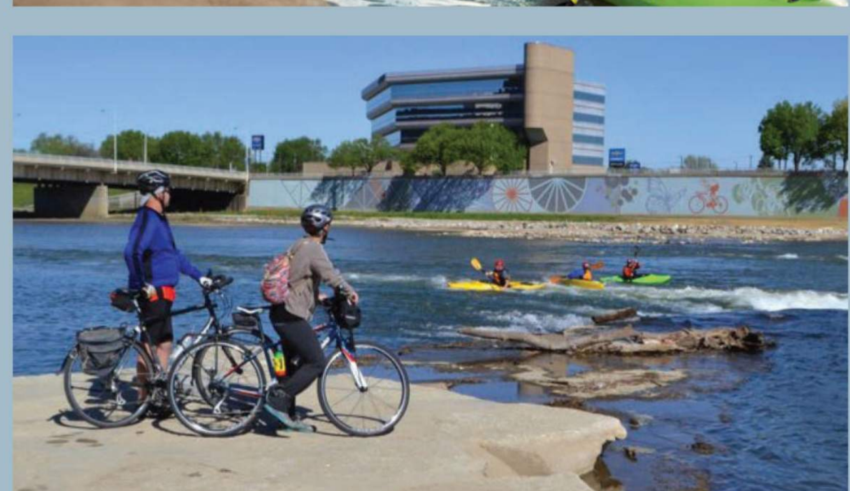
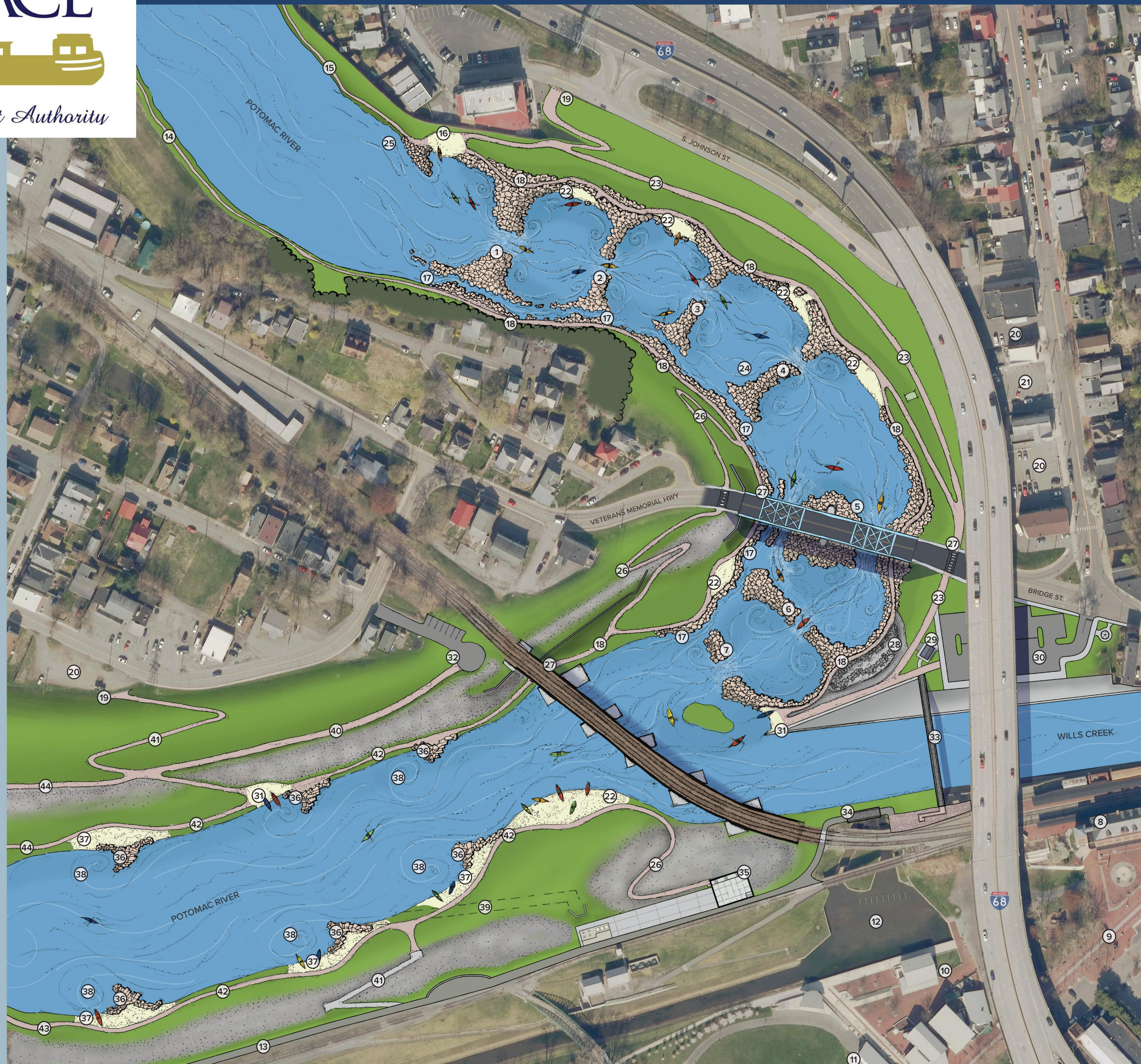
THE RIVER PARK AT CANAL PLACE
CONCEPTUAL MASTERPLAN

CANAL PLACE
Preservation & Development Authority

RIVER PARK EXAMPLE IMAGES



JANUARY 2024



Plan Key

1. FEATURE 1 (2' DROP)
2. FEATURE 2 (2' DROP)
3. FEATURE 3 (2' DROP)
4. FEATURE 4 (1.5' DROP)
5. FEATURE 5 (2.5' DROP)
6. FEATURE 6 (1.5' DROP)
7. FEATURE 7 (1.5' DROP)
8. CANAL PLACE AND WESTERN MD SCENIC RAILROAD
9. GREAT ALLEGHENY PASSAGE - MILE MARKER ZERO
10. NATIONAL PARK SERVICE
11. FESTIVAL GROUNDS / CANAL PLACE SHOPS
12. CANAL BASIN
13. C&O CANAL TOWPATH NATIONAL PARK
14. FUTURE CARPENDALE, WV LOOP
15. YMCA CONNECTOR TRAIL
16. BOATER ACCESS
17. FISH PASSAGE (CONTINUOUS PASSAGE)
18. RIVERFRONT WALKWAY
19. UPPER RIVER PARK TRAIL ACCESS
20. PUBLIC SHARED PARKING
21. PUBLIC METERED PARKING
22. BEACH AND VIEWING AREA
23. TOP OF LEVEE TRAIL
24. EXISTING CANAL WATER INTAKE
25. PROPOSED CANAL WATER INTAKE
26. RIVERFRONT WALKWAY ACCESS
27. WALKWAY UNDERPASS
28. NATURAL ROCK SEATING
29. PROPOSED GEORGE WASHINGTON'S HEADQUARTERS RELOCATION
30. PROPOSED PARKING LOT
31. BOATER ACCESS
32. RIVER PARK TRAILHEAD AND PARKING
33. EXISTING PEDESTRIAN BRIDGE OVER WILLS CREEK
34. PROPOSED BRIDGE CONNECTOR
35. VIEWING PLATFORM
36. DEFLECTOR
37. LOWER RIVER PARK WATER ACCESS
38. FISH HABITAT
39. FUTURE CSO OUTLET MODIFICATION
40. EMERGENCY AND ADA RIVER PARK ACCESS
41. ADA RIVERFRONT ACCESS
42. RIVERFRONT WALKWAY WITH FISHING ACCESS
43. MD LOOP TRAIL (1.3 MILES)
44. TRESTLE LOOP TRAIL (3.5 MILES IN MD AND WV)

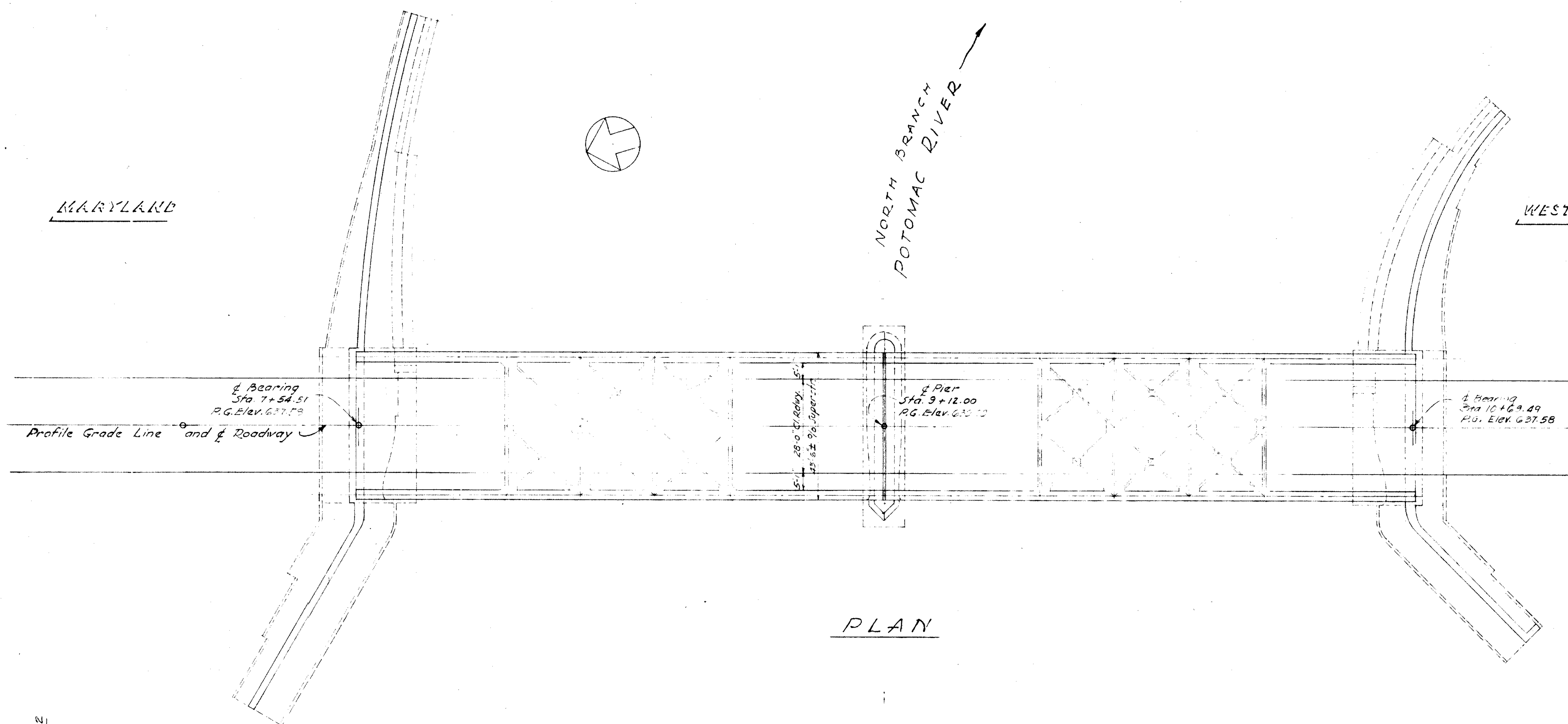
NORTH
SCALE IN FEET
0' 60' 120'

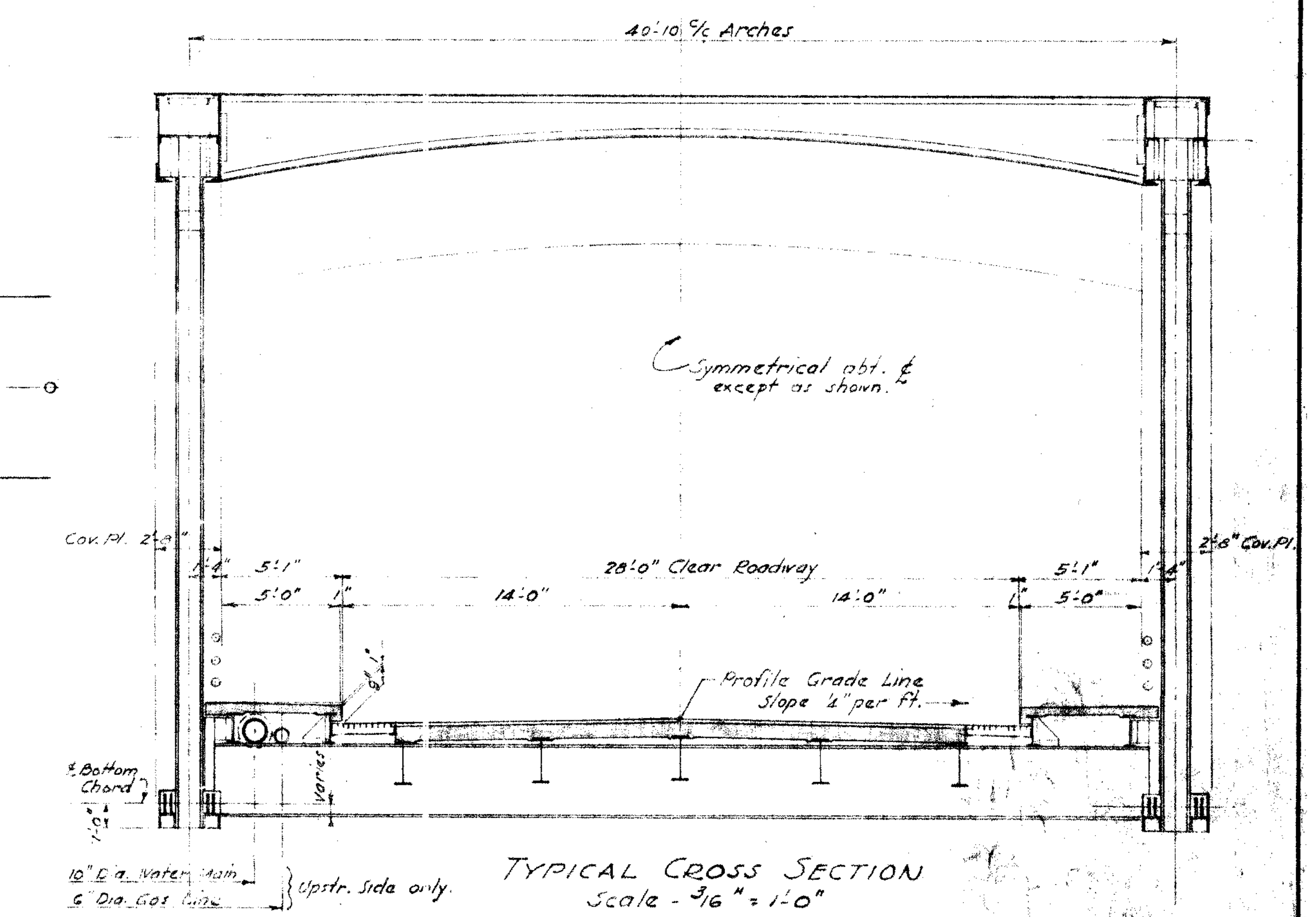
Recreation Engineering & Planning

PASSAGES OF THE WESTERN POTOMAC HERITAGE AREA

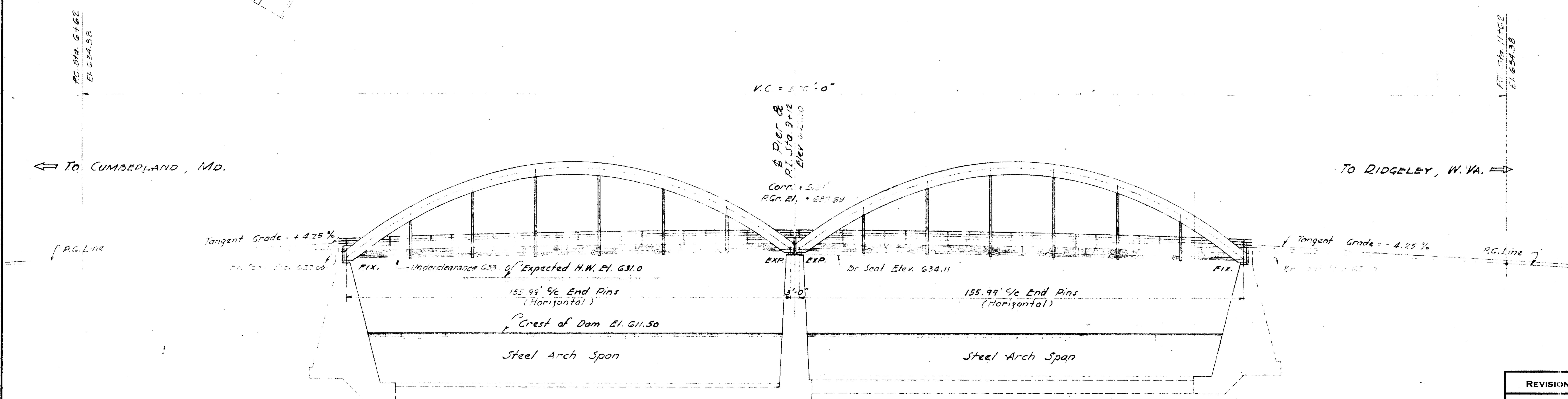
CEC Civil & Environmental Consultants, Inc.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			





TYPICAL CROSS SECTION
Scale - 3/16" = 1'-0"



GENERAL NOTES :

Specifications: S.R.C. Specifications dated June, 1949 for materials and construction. A.A.S.H.O. Standard Specifications for Highway Bridges dated 1953 for design.

Loading: H20-44

Camber: Floor Beams and Stringers are not to be cambered, but if they are not rolled exactly true they are to be placed with the concave side down.

Chamfer: All exposed edges of concrete are to be chamfered ½" x ½" unless otherwise directed by the Engineer.

Rivets: ⅞" ϕ unless otherwise noted.

Open Holes: 15/16" ϕ unless otherwise noted.

Wearing Surface: 2" Bituminous Concrete - Specification "B"

REVISIONS

STATE OF MARYLAND
STATE ROADS COMMISSION
BALTIMORE, MD.

RELOCATION OF BLUE BRIDGE
(JOHNSON ST. BRIDGE)
OVER POTOMAC RIVER AT CUMBERLAND, MD.

PLAN & ELEVATION

SCALE 1" = 20'-0" DATE Dec. 1953 CONTRACT A 440-1-615

MADE BY Wroe
TRACED BY
CHECKED BY Comber
APPROVED [signature] ENGINEER OF BRIDGE DESIGN 12/28/53
APPROVED [signature] DEPUTY CHIEF ENGINEER 12/28/53

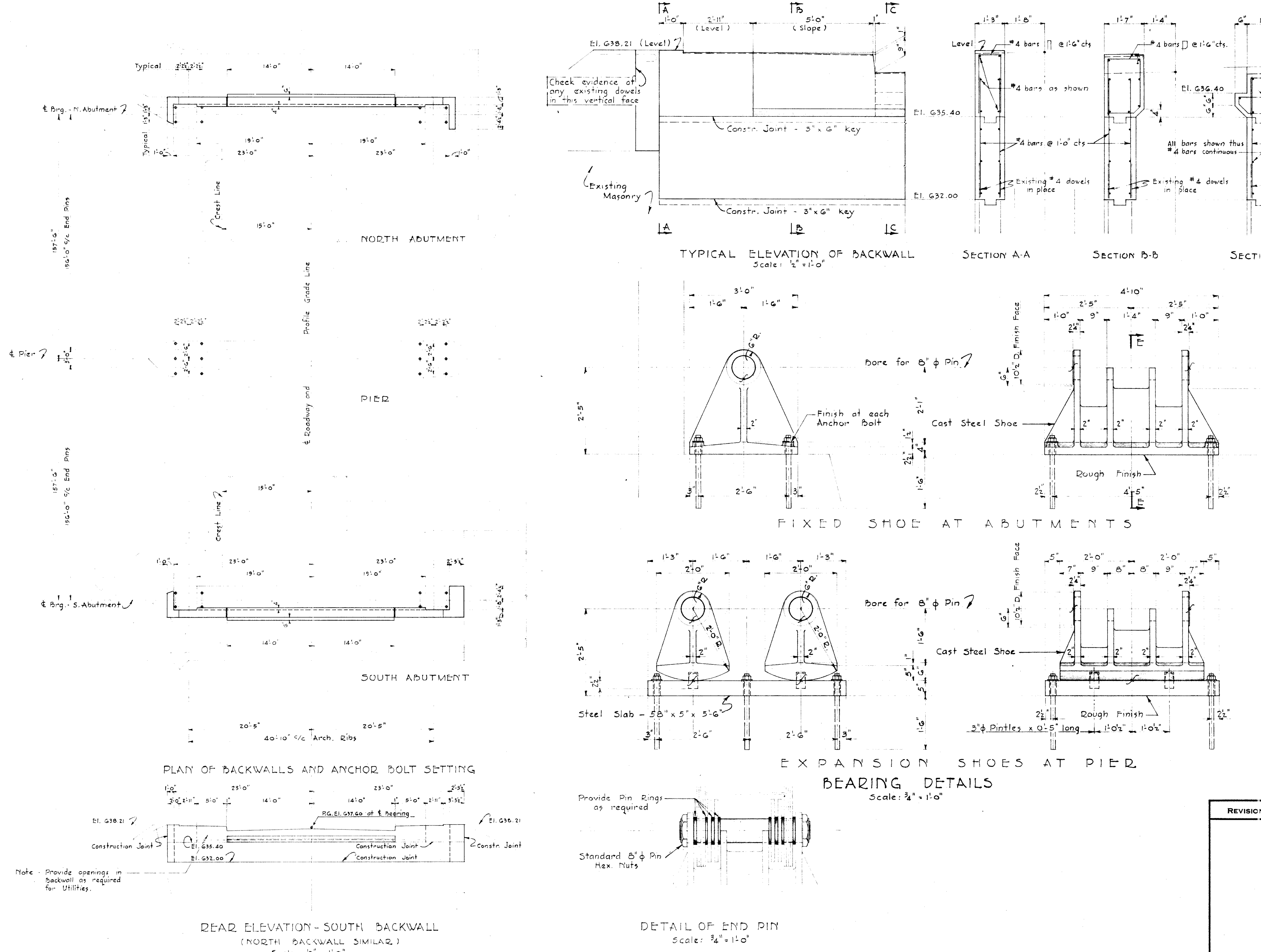
SHEET NO. 1 OF 6

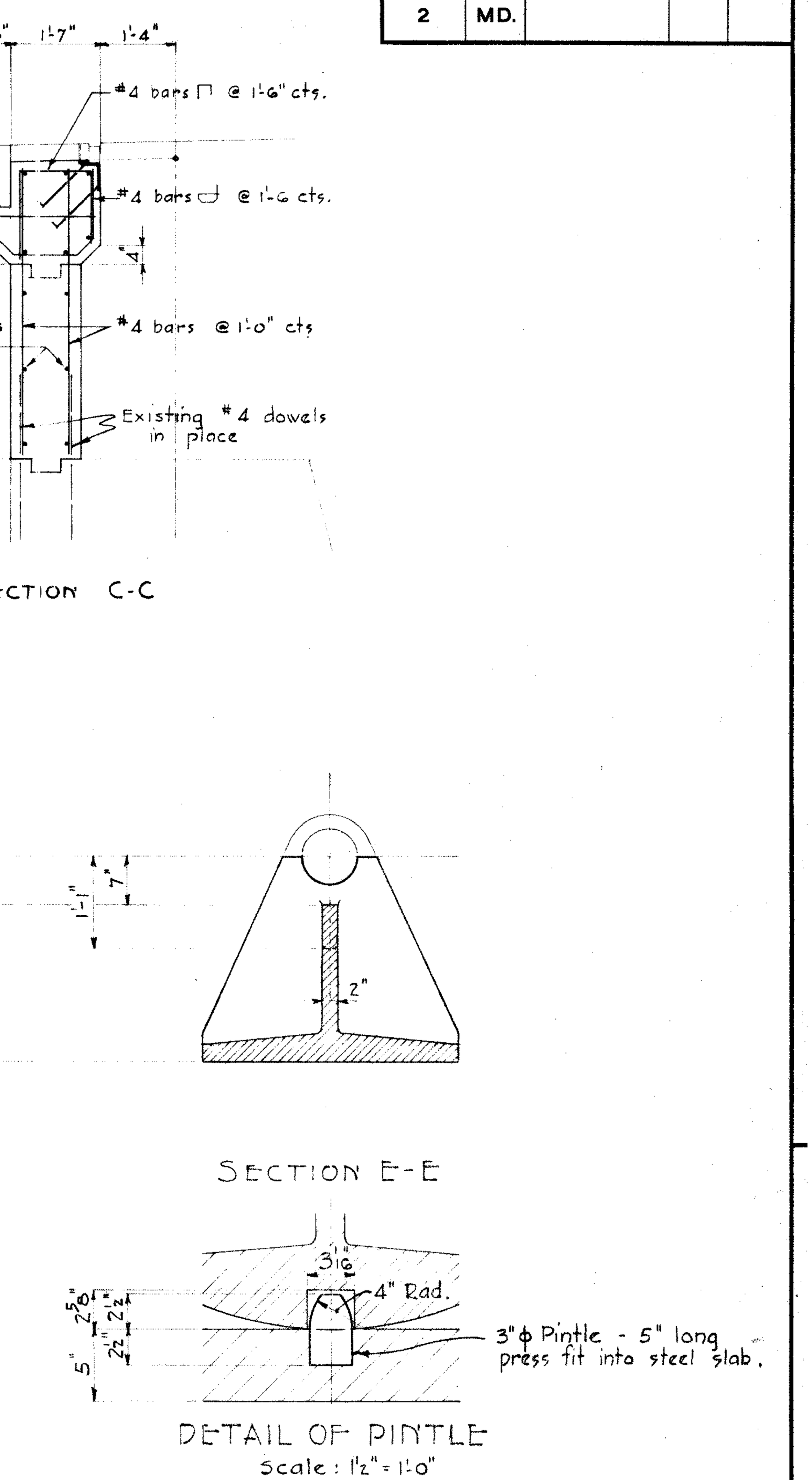
Survey Book No.

File No. Pocket No. Folder No.

INDEXED 115

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			





Note -
Anchor Bolts to be 1 1/2" ϕ Swedge Bolts with 3 1/2" ϕ x 1/4" thick Washer and Standard Hex. Nut.
Holes in Shoes for Anchor Bolts to be 1 7/8" ϕ Cored Holes
Holes in Steel Slabs for Anchor Bolts to be 1 5/8" ϕ.
Anchor Bolts to be set in Grout in Holes drilled in existing masonry - See Anchor Bolt Setting.

REVISIONS

STATE OF MARYLAND
STATE ROADS COMMISSION
BALTIMORE, MD.

RELOCATION OF BLUE BRIDGE
(JOHNSON ST. BRIDGE)
OVER POTOMAC RIVER AT CUMBERLAND, MD.
BACKWALLS & BEARING DETAILS

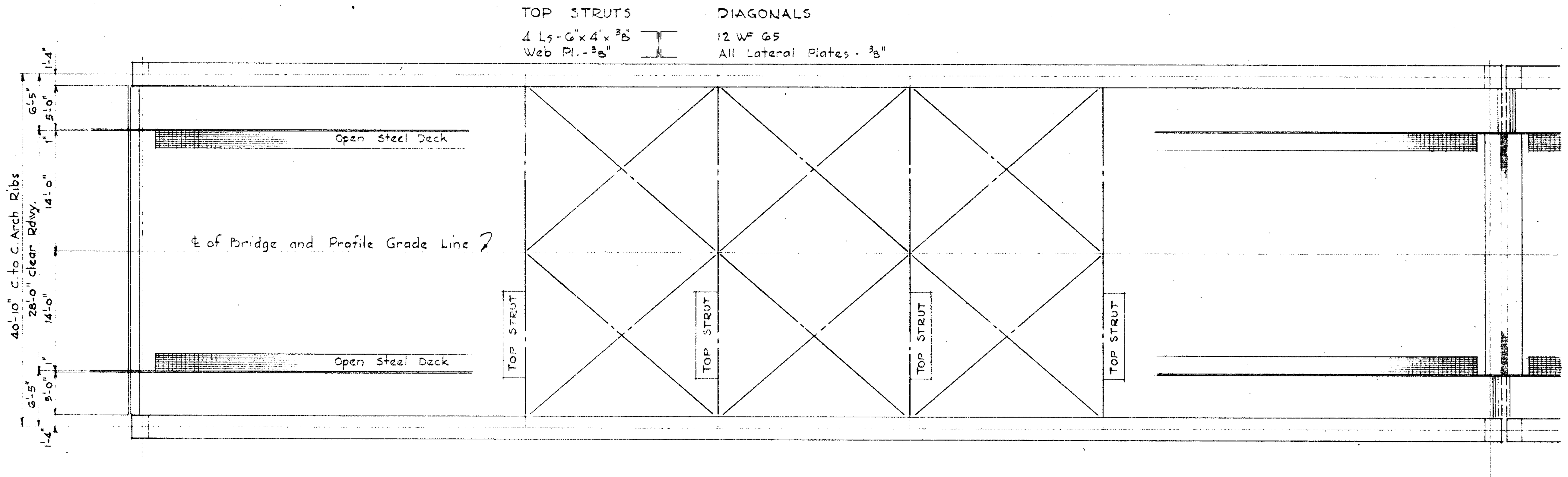
SCALE As Noted DATE Dec. 1953 CONTRACT A440-1-615

MADE BY Wroe
TRACED BY
CHECKED BY Camber
APPROVED [signature] 12/28/53 ENGINEER OF BRIDGE DESIGN
APPROVED W C Hopkins DEPUTY CHIEF ENGINEER 12/29/53

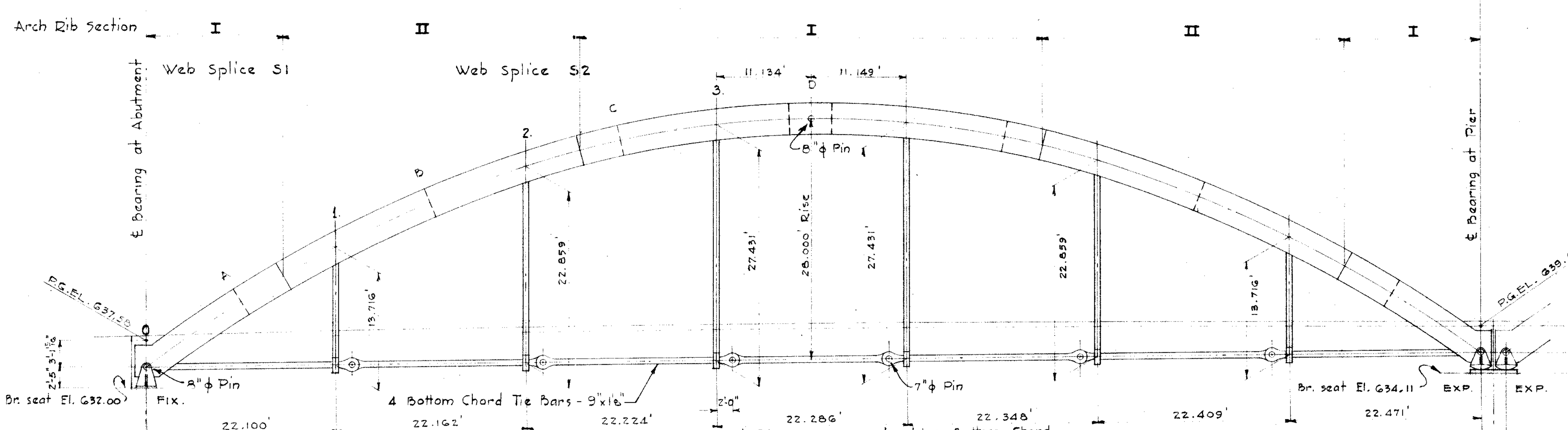
SHEET NO. 2 OF 6

Survey Book No. File No. Pocket No. Folder No. INDEXED 115

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			



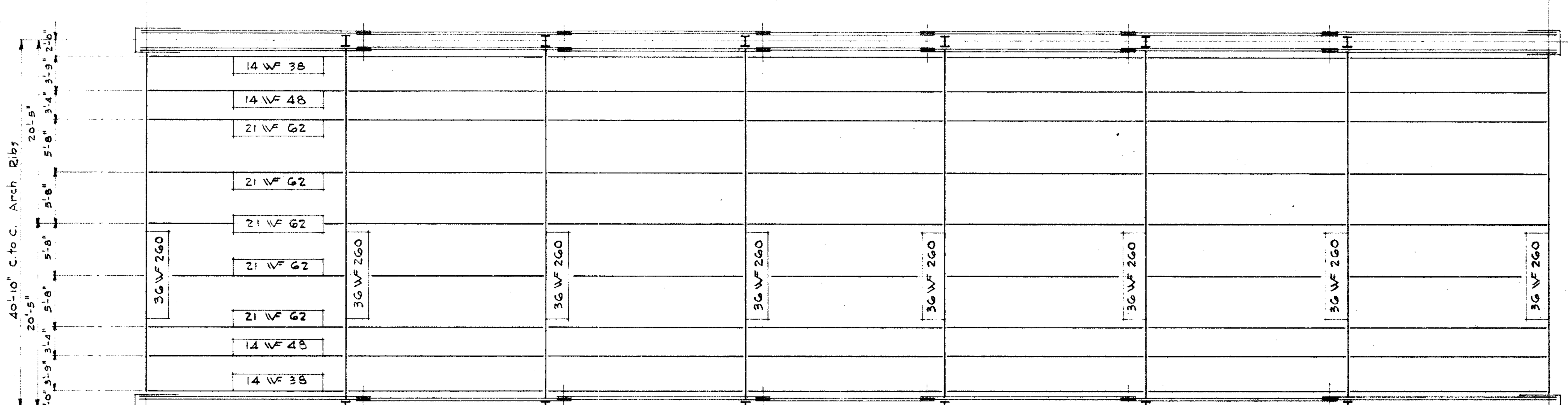
PLAN - TOP LATERAL SYSTEM
Scale - 1" = 10'-0"



ELEVATION
Scale - 1" = 10'-0"

MAXIMUM VERTICAL REACTION

LOAD	REACTION
Dead	360.00
Live (Swk.)	27.00
Live (Rdwy.)	118.00
Impact 18 %	21.00
TOTAL	★ 526.00 K



PLAN OF FLOOR SYSTEM
Scale - 1" = 10'-0"

ROADWAY STRINGER

LOAD	SHEAR	MOMENT
Dead	8.14	45.40
Live (Swk.)	———	———
Live (Rdwy.)	17.48	101.15
Impact 30%	5.24	30.35
TOTAL	30.86 K	176.90 KF

176.90 x 12 ÷ 18 = 118.0 in³ (S.M. Req'd.)
Use 21 WF 62 = 126.4 in³ (S.M. Furn.)

INTERIOR SWK. (CURB) STRINGER

LOAD	SHEAR	MOMENT
Dead	4.45	25.00
Live (Swk.)	2.42	13.50
Live (Rdwy.)	8.75	45.75
Impact 30%	2.63	13.75
TOTAL	18.25 K	98.00 KF

98.00 x 12 ÷ 18 = 65.4 in³ (S.M. Req'd.)
Use 14 WF 48 = 70.2 in³ (S.M. Furn.)

EXTERIOR SWK. STRINGER

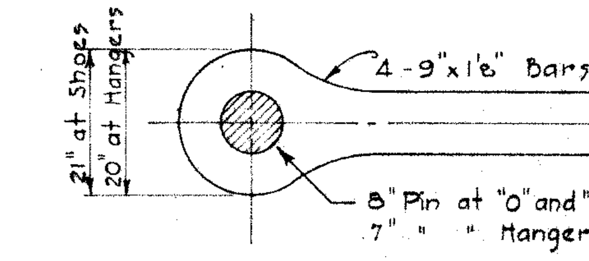
LOAD	SHEAR	MOMENT
Dead	5.85	32.60
Live (Swk.)	2.48	13.80
Live (Rdwy.)	———	———
Impact	———	———
TOTAL	8.33 K	46.40 KF

46.40 x 12 ÷ 18 = 31.0 in³ (S.M. Req'd)
Use 14 WF 38 = 54.6 in³ (S.M. Furn.)

BOTTOM CHORD TIE BARS

LOAD	TENSION
Dead	478.00
Live (Swk.)	36.00
Live (Rdwy.)	139.00
Impact 18 %	25.00
TOTAL	★ 678.00 K

678.00 ÷ 18 = 37.7 in² (Net A Req'd.)
Use 4 bars 9"x1½" = 40.5 in² (Net A Furn.)



INTERIOR FLOOR BEAM

LOAD	SHEAR	MOMENT
Dead	57.20	585.00
Live (Swk.)	———	———
Live (Rdwy.)	60.20	604.15
Impact 30%	18.06	181.25
TOTAL	★ 135.46 K	★ 1370.40 KF

1370.40 x 12 ÷ 18 = 913.6 in³ (S.M. Req'd)
Use 36 WF 260 = 951.1 in³ (S.M. Furn.)

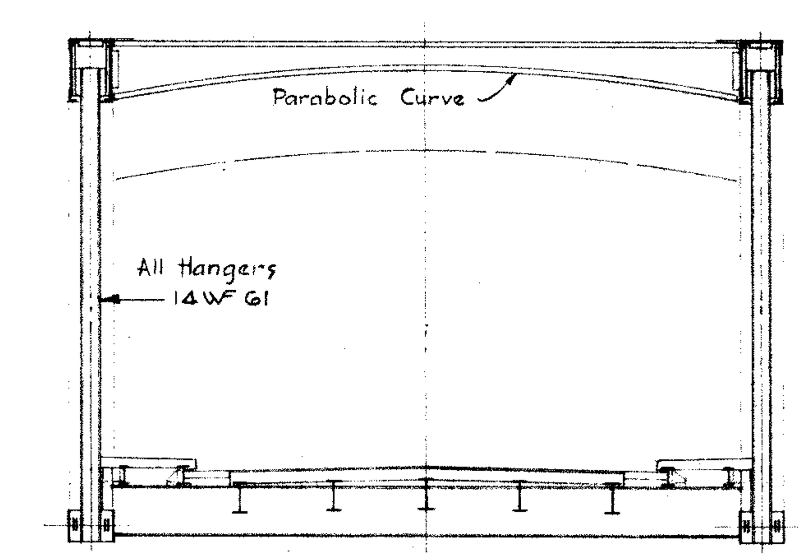
END FLOOR BEAM

Use 36 WF 260 Develop same end shear as req'd for Interior Floor Bm.

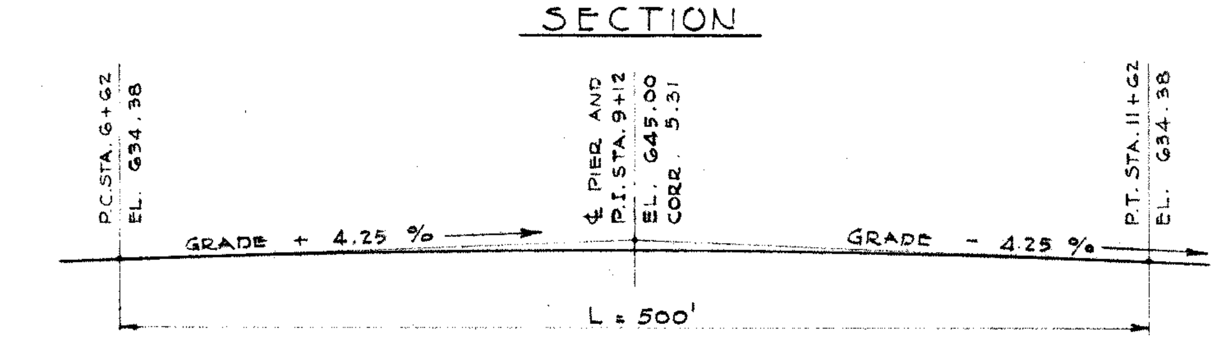
HANGER

LOAD	TENSION
Dead	84.50
Live (Swk.	7.00
Live (Rdwy.)	62.50
Impact 30%	19.00
Wind (Mc ÷ r²)	163.00
	★ 336.00 K

336.00 ÷ 22.5 = 14.90 in² (Net A Req'd)
Use 14WF61 = 17.94 - (4 x 5/8) = 15.44 in² (Net A Furn.)



SECTION



PROFILE OF VERTICAL CURVE

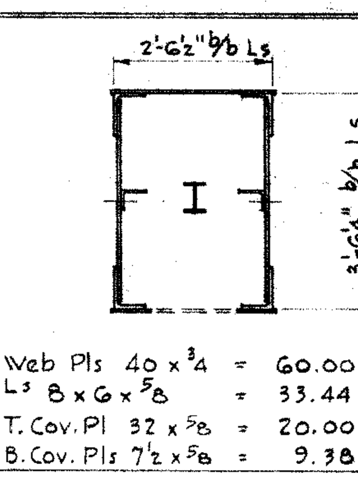
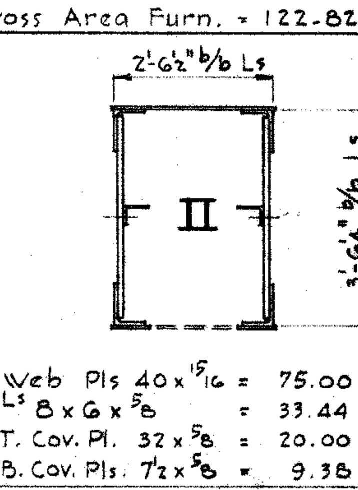
GENERAL NOTES

Thrusts are given in Thousands of Pounds (Kips)
Moments " " " " Foot Pounds (Kip Feet)
+M denotes Moment causing Compression in Top Flange of Arch Rib.
-M " " " " " Bottom " " "
+T " Normal Thrust to be Combined with +M
-T " " " " " " " -M
Arch Rib from Shoe Pin to Top Pin shall be made complete in shop as one member. Web Splices shall be located at points indicated on Elevation.
Diaphrams at A, B and C (½" Web Pl., 8 Ls 4 x 3½ x 3/8) shall be Normal to Arch Rib.
Diaphrams " 1, 2 and 3 (5/8" Web Pl., 6 Ls 4 x 3½ x 3/8) " " in Plane of Hanger.
Diaphrams " D (½" Web Pl., 8 Ls 4 x 3½ x 3/8) " " Normal to Arch Rib.
For all Arch Rib Sections - 2 Stiff. Ls 5 x 3½ x 7/16" between Diaphrams and Splices.
All Hangers and Floor Beam Webs are to be placed in Vertical Plane.
Webs of Top Struts (in plane of hanger) shall be bent at top to place Top Flange Angles tangent to Arch Rib.

Tabulated Values preceded by (+) or (-) represent 70% of actual Dead Load Moment to be combined with Live Load Moments of opposite sign.
★ Design Values are computed on basis of Future 36'± Clear Roadway with 5'-0"± Sidewalk supported on outside of each Arch Rib.

ARCH RIB TABLE OF MAXIMUM STRESSES

NOTE - This Tabulation of Stresses does not include check analysis for Two Hinged Arch Condition affected by riveting center hinge after all dead load has been applied, which condition does not change the required section of any member.

POINT ON RIB	LOAD	MOMENT +M	MOMENT -M	THRUST +T	THRUST -T	DESIGN	SECTION
O	D	—	—	—	563		
	L (Swk)	—	—	—	42		
	L (Rdwy)	—	—	—	160	T = 741	
	I	—	—	—	29	Mc÷r² = 820	
	T	—	—	—	794	Total 1561	
A	D	(-) 143	205	564	564		 2'-6½" b/b Ls; I; 3'-6¾" b/b Ls
	L (Swk)	65	80	14	29	l/r = 50	
	L (Rdwy)	375	351	71	121		
	I	113	74	21	25	P/A = 14.4 ksi	
	T	410	710	670	739		
S1	D	(-) 86	123	564	564	A Req'd:	2 Web Pls 40 x 3/4 = 60.00 in²
	L (Swk)	96	105	14	29	1561/14.4	4 Ls 8 x 6 x 5/8 = 33.44 in²
	L (Rdwy)	552	462	69	121		1 T. Cov. Pl 32 x 5/8 = 20.00 in²
	I	155	102	19	27		2 B. Cov. Pls 7½ x 5/8 = 9.38 in²
	T	717	792	666	741	= 108.4 in²	Gross Area Furn. = 122.82 in²
1	D	137	(+) 96	560	560		 2'-6½" b/b Ls; II; 3'-6¾" b/b Ls
	L (Swk)	140	130	14	29		
	L (Rdwy)	792	571	68	121	T = 596	
	I	222	126	19	27	Mc÷r² = 1440	
	T	1291	731	661	737	Total 2036	
B	D	(-) 64	92	518	518		
	L (Swk)	142	148	10	29	l/r = 20	
	L (Rdwy)	695	666	57	122		
	I	180	153	15	28	P/A = 14.9 ksi	
	T	953	1059	600	697		
2	D	227	(+) 159	515	515	A Req'd:	2 Web Pls 40 x 15/16 = 75.00 in²
	L (Swk)	154	137	10	29	2036/14.9	4 Ls 8 x 6 x 5/8 = 33.44 in²
	L (Rdwy)	831	629	56	121		1 T. Cov. Pl. 32 x 5/8 = 20.00 in²
	I	216	145	15	28		2 B. Cov. Pls. 7½ x 5/8 = 9.38 in²
	T	1428	752	596	693	= 136.6 in²	Gross Area Furn = 137.82 in²
S2	D	15	(+) 11	488	488		
	L (Swk)	117	115	8	29		
	L (Rdwy)	632	552	43	121		
	I	164	130	11	28		
	T	928	786	550	666		
C	D	(-) 16	23	488	488		
	L (Swk)	101	103	18	19		
	L (Rdwy)	525	491	88	90	T = 550	
	I	137	113	23	21	Mc÷r² = 956	
	T	747	730	617	618	Total 1506	I
3	D	274	(+) 192	485	485		
	L (Swk)	82	62	17	18	l/r = 20	
	L (Rdwy)	393	295	88	88		
	I	98	74	22	22	P/A = 14.9 ksi	
	T	847	239	612	613		
D	D	—	—	—	478	A Req'd.	
	L (Swk)	—	—	—	36	1506/14.9	
	L (Rdwy)	—	—	—	139		
	I	—	—	—	25		
	T	—	—	—	678	= 101.1 in²	

REVISIONS

STATE OF MARYLAND
STATE ROADS COMMISSION
BALTIMORE, MD.

RELOCATION OF BLUE BRIDGE
(JOHNSON ST. BRIDGE)
OVER POTOMAC RIVER AT CUMBERLAND, MD.
STRESS SHEET

SCALE AS NOTED DATE AUG. 1953 CONTRACT A440-1-615

MADE BY WROE
TRACED BY
CHECKED BY Comber
APPROVED [signature] ENGINEER OF BRIDGE DESIGN 12/28/53
APPROVED W C Hopkins DEPUTY CHIEF ENGINEER 12/28/53

SHEET NO. 3 OF 6

File No. Pocket No. Folder No. Survey Book No. INDEXED

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			

REVISIONS

STATE OF MARYLAND
STATE ROADS COMMISSION
BALTIMORE, MD.

RELOCATION OF BLUE BRIDGE
(JOHNSON ST. BRIDGE)
OVER POTOMAC RIVER AT CUMBERLAND, MD.
STEEL DETAILS

SCALE 1/2"=1'-0" DATE Nov. 1953 CONTRACT A440-1-615

MADE BY Wroe
TRACED BY
CHECKED BY Comber
APPROVED [signature] ENGINEER OF BRIDGE DESIGN 12/28/53
APPROVED W. C. Hopkins DEPUTY CHIEF ENGINEER 12/28/53

SHEET NO. 4 OF 6

Survey File No. Pocket No. Folder No. INDEXED

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			

REVISIONS	STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD. RELOCATION OF BLUE BRIDGE (JOHNSON ST. BRIDGE) OVER POTOMAC RIVER AT CUMBERLAND, MD. ROADWAY JOINTS
	SCALE AS NOTED DATE Dec. 1953 CONTRACT A440-1-615
	MADE BY Wroe TRACED BY CHECKED BY Comber APPROVED [signature] ENGINEER OF BRIDGE DESIGN 12/28/53 APPROVED W.C. Hopkins DEPUTY CHIEF ENGINEER 12/28/53
	SHEET NO. 5 OF 6

Survey Book No.

File No. Pocket No. Folder No.

INDEXED 115

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
2	MD.			

REVISIONS	STATE OF MARYLAND STATE ROADS COMMISSION BALTIMORE, MD. RELOCATION OF BLUE BRIDGE (JOHNSON ST. BRIDGE) OVER POTOMAC RIVER AT CUMBERLAND, MD. DETAILS OF HANDRAIL
	SCALE AS NOTED DATE Dec. 1953 CONTRACT A-440-1-615
	MADE BY Wroe TRACED BY CHECKED BY Comber APPROVED [signature] ENGINEER OF BRIDGE DESIGN 12/28/53
	APPROVED W C Hopkins DEPUTY CHIEF ENGINEER 12/28/53
	SHEET NO. 6 OF 6

Survey Book No.

File No. Pocket No. Folder No.

INDEXED 115

POTOMAC RIVER BASIN

PLANS FOR

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. & RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM

1952

AS BUILT DRAWINGS

CORPS OF ENGINEERS, U. S ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT
WASHINGTON 25, D.C.

TO ACCOMPANY SPECIFICATION SERIAL NO. CIVENG 49-080-53-25
DATED 16 FEBRUARY 1953

B-251-204

NORTH BRANCH POTOMAC RIVER

INDUSTRIAL DAM

INDEX TO DRAWINGS

SHEET NO.	TITLE	DRAWING NO.
1	TOPOGRAPHY OF WILLS CREEK AND WEST CUMBERLAND AREAS	B-251-204.1
2	LOCATION OF SUBSURFACE EXPLORATION	B-251-204.2
3	SUBSURFACE EXPLORATIONS OVERBURDEN DRILLINGS	B-251-204.3
4	GENERAL PLAN	B-251-204.4
5	HYDROGRAPHS OF DAILY DISCHARGES	B-251-204.5
6	DETAILS OF NORTH ABUTMENT	B-251-204.6
7	DETAILS OF SOUTH ABUTMENT	B-251-204.7
8	DETAILS OF BRIDGE ABUTMENTS	B-251-204.8
9	FOUNDATION PLAN	B-251-204.9
10	SECTIONS 222+30 – 225+00	B-251-204.10
11	SECTIONS 225+00 – 227+80	B-251-204.11
12	ALIGNMENT PLAN	B-251-204.12
13	PIER ENCASEMENT	B-251-204.13

LEGEND

EXISTING		NEW
(with designations)	CONDUITS AND SEWERS	
	WATER LINE	
	GAS LINE	
	POWER LINE	
T T T	TELEPHONE LINE	
x x x	FENCE	
	EASEMENT LINE	
(in plan) (in section)	WORK	(in plan) (in section)
	FUTURE WORK	(with designation)
624	CONTOURS	624
	SHORE LINE	

GENERAL NOTES

1 *All cross sections are shown looking upstream.*

2 *Right or left banks and/or walls refer to banks or walls when looking downstream.*

3 *The relocation of water, gas, telephone power lines and services, where required, will be performed by others.*

4 *Payment lines for excavation and concrete will be as shown on the drawings or as directed by the contracting officer.*

5 *Circled numbers on sheets 1 thru 12 refer to item numbers under which payment will be made.*

6 *All work designated by light dashed lines not included in this contract.*

7 *All concrete work shall be constructed in alternate monoliths unless otherwise approved.*

8 *Horizontal construction joints in the spillway section to be as shown on the drawings.*

9 *Tolerances; Concrete spillway crest ± .005' in 20' horizontal.*
Top of walls ± 1/4" in 20' horizontal.
Spillway apron ± 1/4" in 20' horizontal.
Bridge seat and top of pier ± 1/4" in 20' horizontal.

10 *Concrete Finish; Class "B" finish to be used on all exposed concrete surfaces*
Class "D" finish to be used on concrete surfaces against which backfill will be placed.

11 *For location of Exploratory Core Borings, see Sheet No. 9 "Plan of Industrial Dam."*

12 *Drilling holes in concrete and / or rock shall be at the location shown on the drawings or as directed by the contracting officer, and the number of drill holes may be increased or decreased as required.*

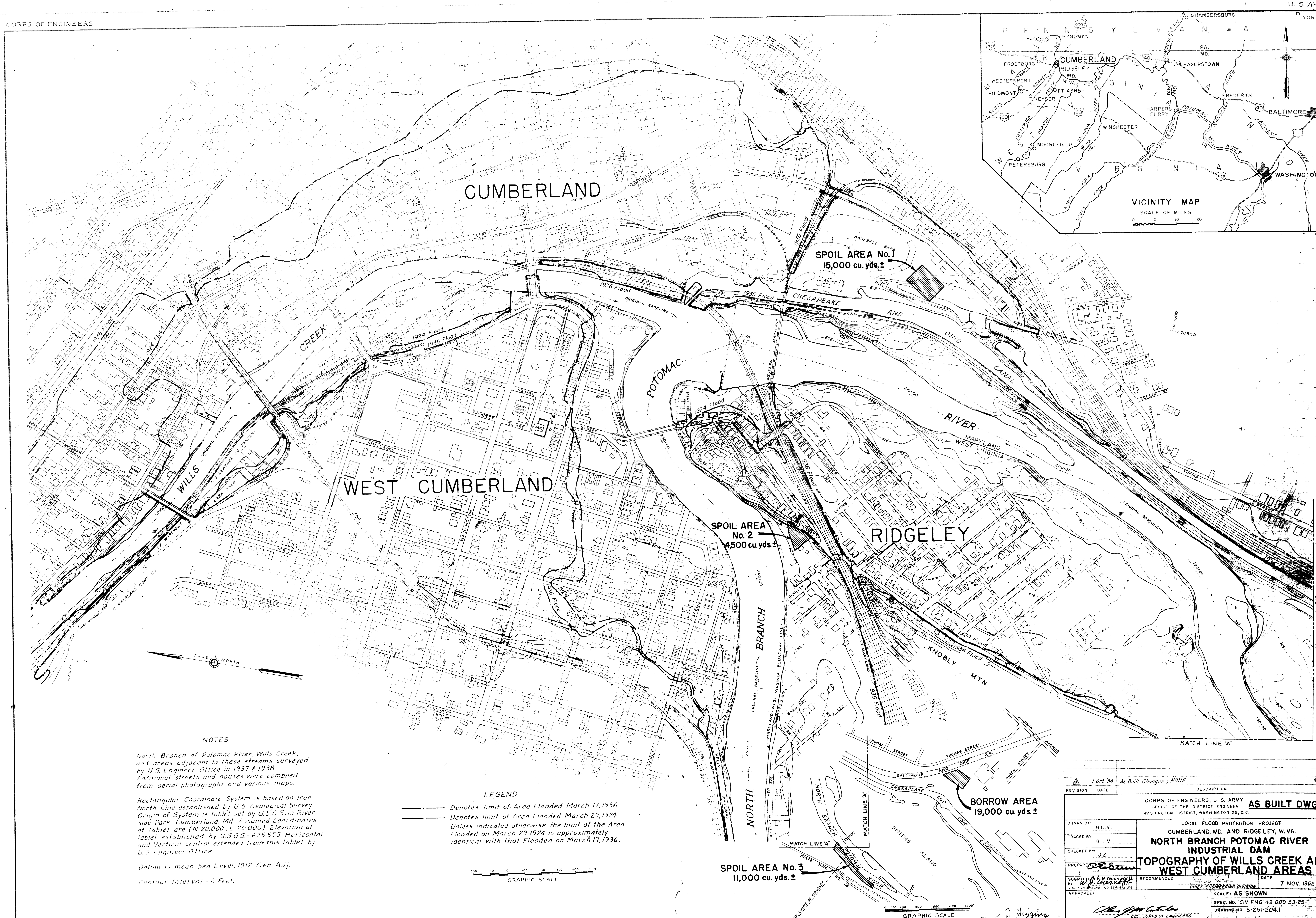
13 *For location of Borrow and Spoil Areas see Sheet No. 1.*

14 *Rock elevations and/or surfaces shown on the profiles and sections are approximate only, having been derived from rock elevations in the borings shown on other drawings. In consequence, rock surfaces and elevations between borings as shown on the drawings cannot be guaranteed.*

AS BUILT DRAWINGS

B-251-204

CORPS OF ENGINEERS



NOTES

North Branch of Potomac River, Wills Creek, and areas adjacent to these streams surveyed by U.S. Engineer Office in 1937 & 1938. Additional streets and houses were compiled from aerial photographs and various maps.

Rectangular Coordinate System is based on True North Line established by U.S. Geological Survey. Origin of System is tablet set by U.S.G.S. in Riverside Park, Cumberland, Md. Assumed Coordinates at tablet are (N-20,000, E-20,000). Elevation at tablet established by U.S.G.S. = 625.555. Horizontal and Vertical control extended from this tablet by U.S. Engineer Office.

Datum is mean Sea Level, 1912 Gen Adj.

Contour Interval = 2 Feet.

LEGEND

—·— Denotes limit of Area Flooded March 17, 1936

— — Denotes limit of Area Flooded March 29, 1924

Unless indicated otherwise the limit of the Area Flooded on March 29, 1924 is approximately identical with that Flooded on March 17, 1936.

GRAPHIC SCALE

REVISION	DATE	DESCRIPTION	BY
4	1 Oct. '54	As Built Changes; NONE	W.D.P.

CORPS OF ENGINEERS, U.S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D.C.

AS BUILT DWG.

DRAWN BY: G.L.M.
TRACED BY: G.L.M.
CHECKED BY: J.Z.
PREPARED: [signature]

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

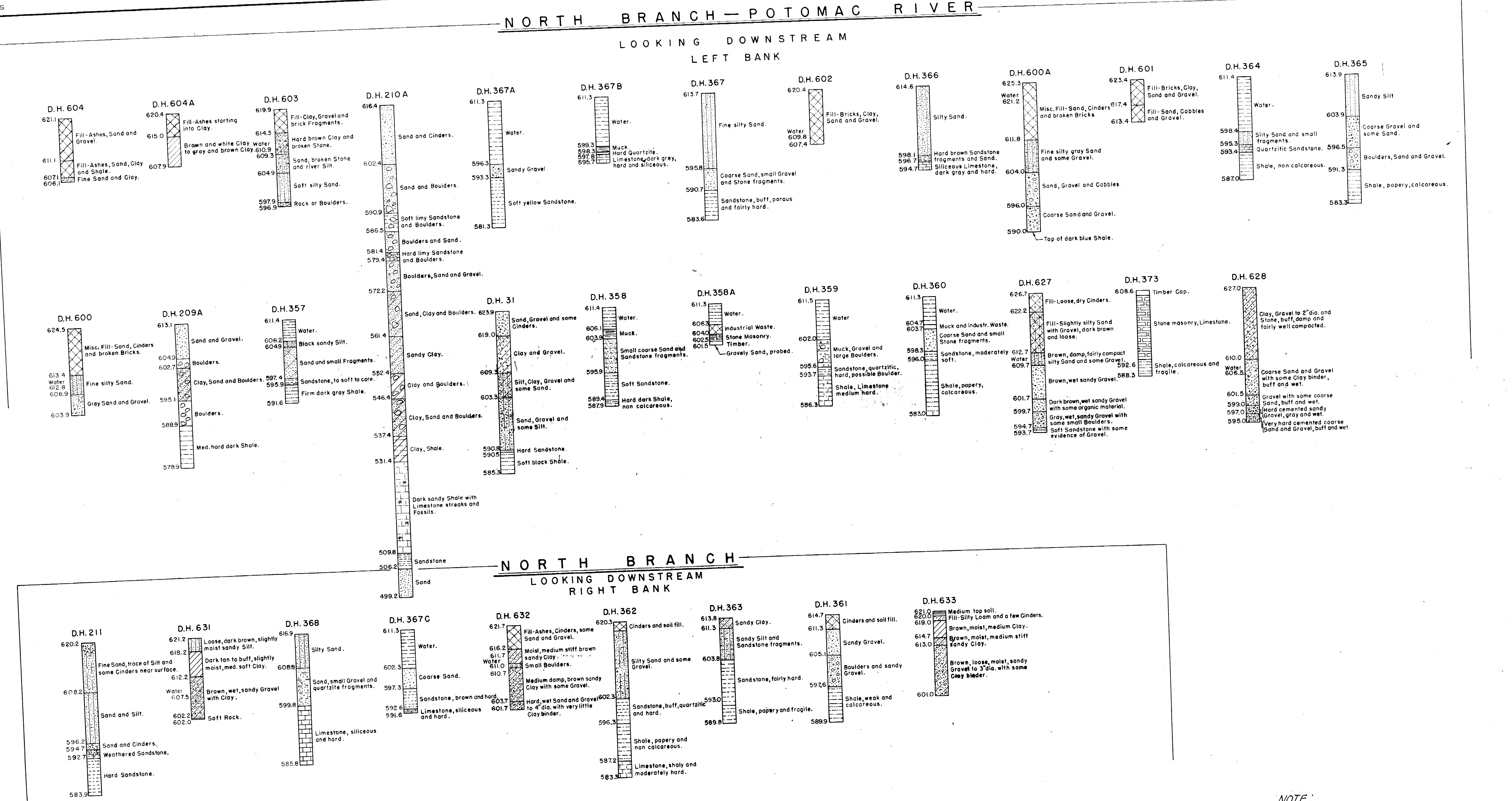
NORTH BRANCH POTOMAC RIVER INDUSTRIAL DAM
TOPOGRAPHY OF WILLS CREEK AND WEST CUMBERLAND AREAS

SUBMITTED BY: R. W. Wadsworth / W. J. Yarnoff, CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED: [signature] CHIEF, ENGINEERING DIVISION
DATE: 7 NOV. 1952
APPROVED: [signature] COL., CORPS OF ENGINEERS, DISTRICT ENGINEER

SCALE: AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.1
SHEET 1 OF 13

B-251-204.1

NORTH BRANCH — POTOMAC RIVER



NOTE:
For location of Subsurface Explorations see Sheet No. 2.

4	1 Oct '54	As Built Changes ; NONE	W.D.R.
REVISION	DATE	DESCRIPTION	BY

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

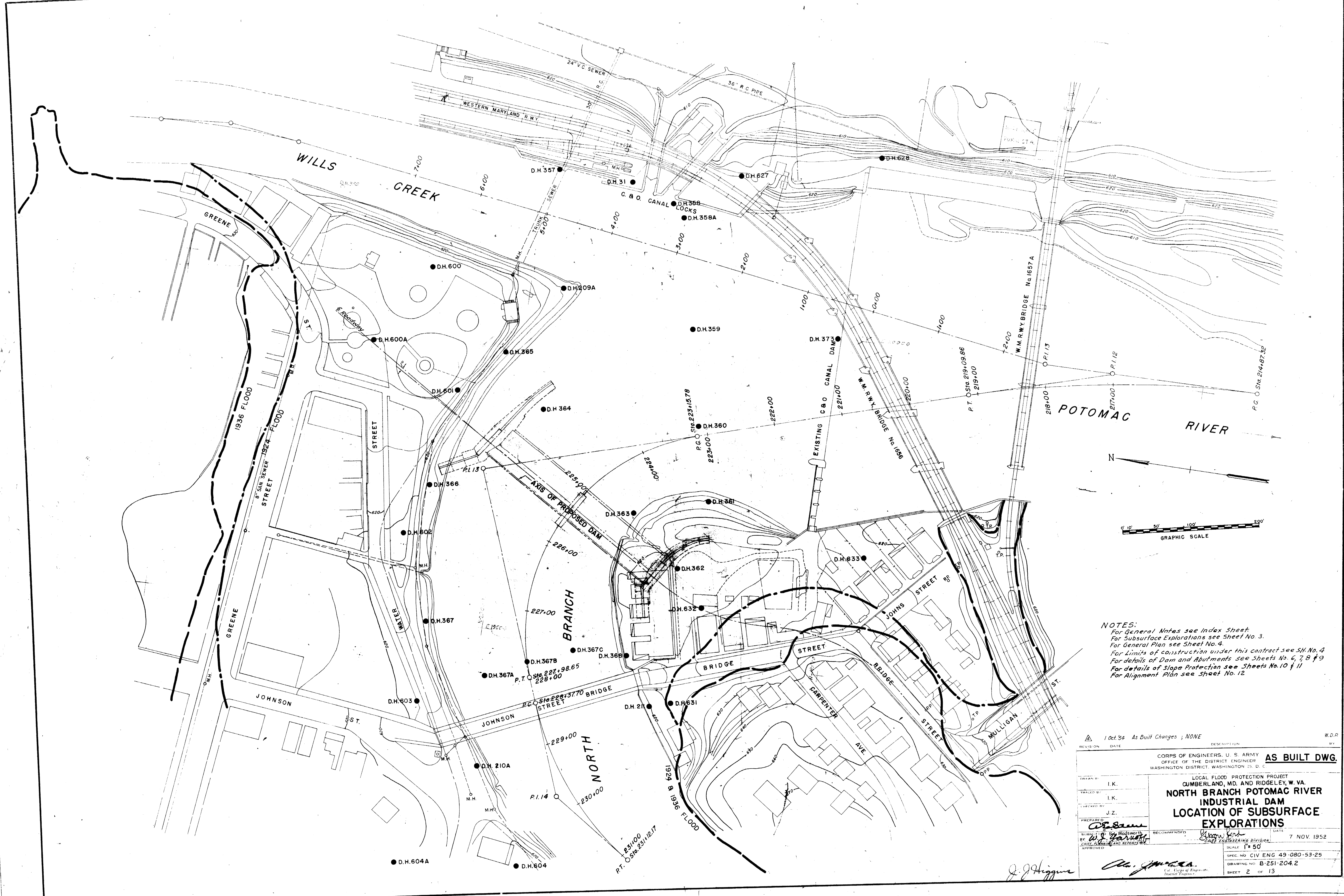
AS BUILT DWG.

DRAWN BY: I.K. G.L.M.
TRACED BY: G.L.M. I.K.
CHECKED BY: J.Z.
PREPARED: [signature]
SUBMITTED BY: R. W. Wadsworth [signature]
CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED: [signature]
CHIEF, ENGINEERING DIVISION
APPROVED: [signature]
Col., Corps of Engineers, District Engineer.

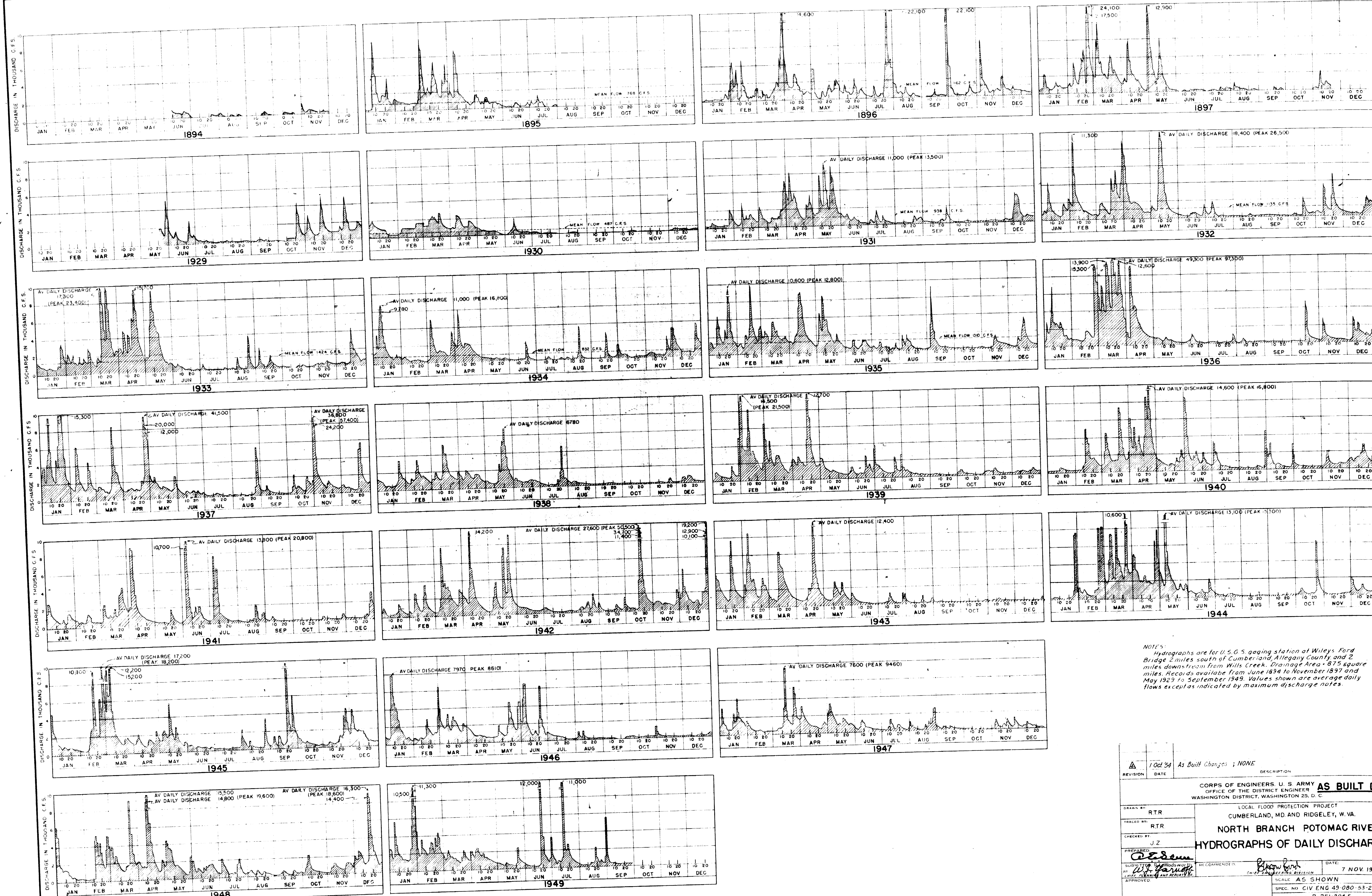
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER INDUSTRIAL DAM
SUBSURFACE EXPLORATIONS OVERBURDEN DRILLINGS

DATE: 7 NOV. 1952
SCALE NONE
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.3
SHEET 3 OF 13


WILLS CREEK
POTOMAC RIVER
NORTH BRANCH
C. & O. CANAL LOCKS
EXISTING C & O CANAL DAM
WESTERN MARYLAND R.W.Y.
W.M.R.W.Y. BRIDGE No. 1656
W.M.R.W.Y. BRIDGE No. 1657 A
AXIS OF PROPOSED DAM
24" V.C. SEWER
36" R.C. PIPE
TRUNK SEWER
8" SAN SEWER
1936 FLOOD
1924 FLOOD
1924 & 1936 FLOOD
GREENE ST.
GREENE STREET
WATER STREET
JOHNSON ST.
JOHNSON STREET BRIDGE
BRIDGE STREET
JOHNS STREET
CARPENTER AVE.
MULLIGAN ST.
D.H. 357
D.H. 31
D.H. 358
D.H. 358A
D.H. 627
D.H. 628
D.H. 600
D.H. 209A
D.H. 600A
D.H. 365
D.H. 359
D.H. 373
D.H. 601
D.H. 364
D.H. 360
D.H. 366
D.H. 363
D.H. 361
D.H. 602
D.H. 362
D.H. 633
D.H. 632
D.H. 367
D.H. 367C
D.H. 369
D.H. 367B
D.H. 367A
D.H. 603
D.H. 211
D.H. 631
D.H. 210A
D.H. 604A
D.H. 604
P.I. 13
P.I. 14
P.I. 12
P.I. 13
P.C. Sta. 223+15.78
P.T. Sta. 227+98.65
P.C. Sta. 228+37.70
P.T. Sta. 231+12.17
P.T. Sta. 219+09.86
P.C. Sta. 214+87.32
GRAPHIC SCALE
N
NOTES:
For General Notes see Index Sheet.
For Subsurface Explorations see Sheet No. 3.
For General Plan see Sheet No. 4.
For Limits of construction under this contract see SH. No. 4
For details of Dam and Abutments see Sheets No. 6, 7, 8 & 9
For details of Slope Protection see Sheets No. 10 & 11
For Alignment Plan see Sheet No. 12
4 1 Oct. '54 As Built Changes ; NONE W.D.P.
REVISION DATE DESCRIPTION BY
CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.
AS BUILT DWG.
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
LOCATION OF SUBSURFACE EXPLORATIONS
DRAWN BY I.K.
TRACED BY I.K.
CHECKED BY J.Z.
PREPARED
SUBMITTED BY R. L. Wadsworth
CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED
CHIEF ENGINEERING DIVISION
DATE 7 NOV. 1952
APPROVED
Col., Corps of Engineers, District Engineer.
SCALE 1" = 50'
SPEC. NO CIV ENG 49-080-53-25
DRAWING NO. B-251-204.2
SHEET 2 OF 13


U.S. ARMY
WILLS CREEK
POTOMAC RIVER
NORTH BRANCH
BALL PARK
HOWARD STREET
WASHINGTON STREET
BALTIMORE ST. BRIDGE
GREENE ST.
JOHNSON ST.
JOHNS STREET (Gravel)
CARPENTER AVE.
MULLIGAN ST.
W.M. RWY DEPOT
2-Sty Brk Bldg
Monument
Brick loading platform
WESTERN MARYLAND R.W.Y.
C. & O. CANAL LOCKS
MILL RACE PUMP STA.
Log Cabin Washington's Headquarters
Temporary Fence
Pier No. 1
Pier No. 2
Pier Encasement
Breeching of Exist. C. & O. Canal Dam in this contract (see sheet No. 10)
℄ Temporary Cofferdam For Pier Encasement as directed
EXISTING C & O CANAL DAM
W.M. R.W.Y. BRIDGE No. 1656
W.M. R.W.Y. BRIDGE No. 1657 A
NOT IN THIS CONTRACT
Section A-A See detail Sh. No. 10
DERRICK STONE
DUMPED RIPRAP
FUTURE LEVEE
Revised ℄ Channel Oct 1950 Low Velocity Channel, Wills Creek
Easement Line
2 Story Brick Building
Brick Building
24" Water Main
Relocated 27" San. Sewer
12" COMBINED SEWER
LEGEND
D.H. 300 Denotes number and location of drill hole
A 400 " " " " Auger
T.P. 152 " " " " test pit
NOTE
Drill holes in 300 series, Test Pit 1.– and all Auger borings made 1945
Drill holes in 600 series made 1949
Notes:
For legend and general notes see Index Sheet.
For subsurface explorations see sheet No. 3
For alignment plan see sheet No. 12
For details of dam and abutments see sheets No. 6, 7, 8 & 9
For details of slope protection see sheets No. 10 & 11
For limiting heights of levee work included in this contract see note sheets No. 10 and 11.
3 For pier encasement of W.M. Rwy. bridge piers No. 1 & 2 see sheet No. 13
4 1 Oct.'54 As Built Changes; approaches added, Temporary Fence relocated W.D.P.
3 21 June'54 Pier encasement added to Piers No. 1 & 2 of W.M. Rwy. Bridge No. 1656 W.D.P.
2 24-Mar.54 Impervious Backfill Material added W.D.P.
1 12 May'53 Street name Corr. W.D.P.
REVISION DATE DESCRIPTION BY
CORPS OF ENGINEERS, U.S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D.C.
AS BUILT DWG.
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH–POTOMAC RIVER
INDUSTRIAL DAM
GENERAL PLAN
I.K.
TRACED BY I.K. R.T.R.
CHECKED BY J.Z.
PREPARED
SUBMITTED BY
RECOMMENDED
CHIEF, ENGINEERING DIVISION
APPROVED
DATE 7 NOV. 1952
SCALE 1" = 50'
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.4
SHEET 4 OF 13
B-251-204.4



NOTES:
Hydrographs are for U.S.G.S. gaging station at Wileys Ford Bridge 2 miles south of Cumberland, Allegany County, and 2 miles downstream from Wills Creek. Drainage Area = 875 square miles. Records availabe from June 1894 to November 1897 and May 1929 to September 1949. Values shown are average daily flows except as indicated by maximum discharge notes.

REVISION	DATE	DESCRIPTION	BY
4	1 Oct. '54	As Built Changes ; NONE	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

AS BUILT DWG.

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER
HYDROGRAPHS OF DAILY DISCHARGES

DRAWN BY: R.T.R.
TRACED BY: R.T.R.
CHECKED BY: J.Z.
PREPARED: [signature]
SUBMITTED BY: R. J. Wadsworth — W. J. Yarnoff [signature], CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED: [signature], CHIEF, ENGINEERING DIVISION
DATE: 7 NOV. 1952
APPROVED: Col., Corps of Engineers, District Engineer
SCALE: AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.5
SHEET 5 OF 13


PLAN
ELEVATION OF ABUTMENT AND WING WALLS
NORTH SIDE
GRAPHIC SCALE
Scale: 1/8"=1'-0"
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
SECTION F-F
SECTION G-G
SECTION H-H
SECTION J-J
SECTION K-K
SECTION L-L
SECTION M-M
SECTION N-N
TYPICAL FOR SOUTH AND NORTH ABUTMENT
Scale: 1/4"=1'-0"
Backwall not in this contract
Chain Link Fence
Top of Fill El. 624.00
Top of Fill El. 616.0
Crest El. 611.50
Stilling Basin El. 592.00
Approx. Rock Surface
Present ground surface
Impervious Fill
Pervious Fill
Derrick Stone
Toe of riprap carried to rock See Sheet No. 4.
NOTES:
For General Notes see Index Sheet.
For location of Abutment see SH. No. 4 and 9.
For details of South Abutment see SH. No. 7.
For details of Bridge Abutments see SH. No. 8.
For foundation Plan see SH. No. 9.
For details of Stone Protection see Sheets No. 10 and 11.
4 | 1 Oct. '54 | As Built changes; 2'-0" Rock removed, seamy shale & mud seams | W.D.P.
3 | 24 Mar. '54 | Impervious Backfill Material added | W.D.P.
1 | 12 May '53 | Fence added to Wing Walls; Dim. Corr. | W.D.P.
REVISION | DATE | DESCRIPTION | BY
CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D.C.
AS BUILT DWG.
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W.VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
DETAILS OF NORTH ABUTMENT
DRAWN BY: I.K.
TRACED BY: I.K. G.L.M.
CHECKED BY: J.Z. W.D.P.
DATE 7 NOV. 1952
SCALE AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.6
SHEET 6 OF 13

NOTES:
For General Notes see Index Sheet.
For location of Abutment see SH. No. 4 and 9.
For details of North Abutment see SH. No. 6.
For details of Bridge Abutments see SH. No. 8.
For foundation Plan see SH. No. 9.
For details of Stone Protection see Sheets No. 10 and 11.

REVISION	DATE	DESCRIPTION	BY
3	1 Oct. '54	As Built Changes: NONE	W.D.P.
2	24 Mar. '54	Impervious Backfill Material added	W.D.P.
1	12 May '53	Fence added to Wing Walls	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

AS BUILT DWG.

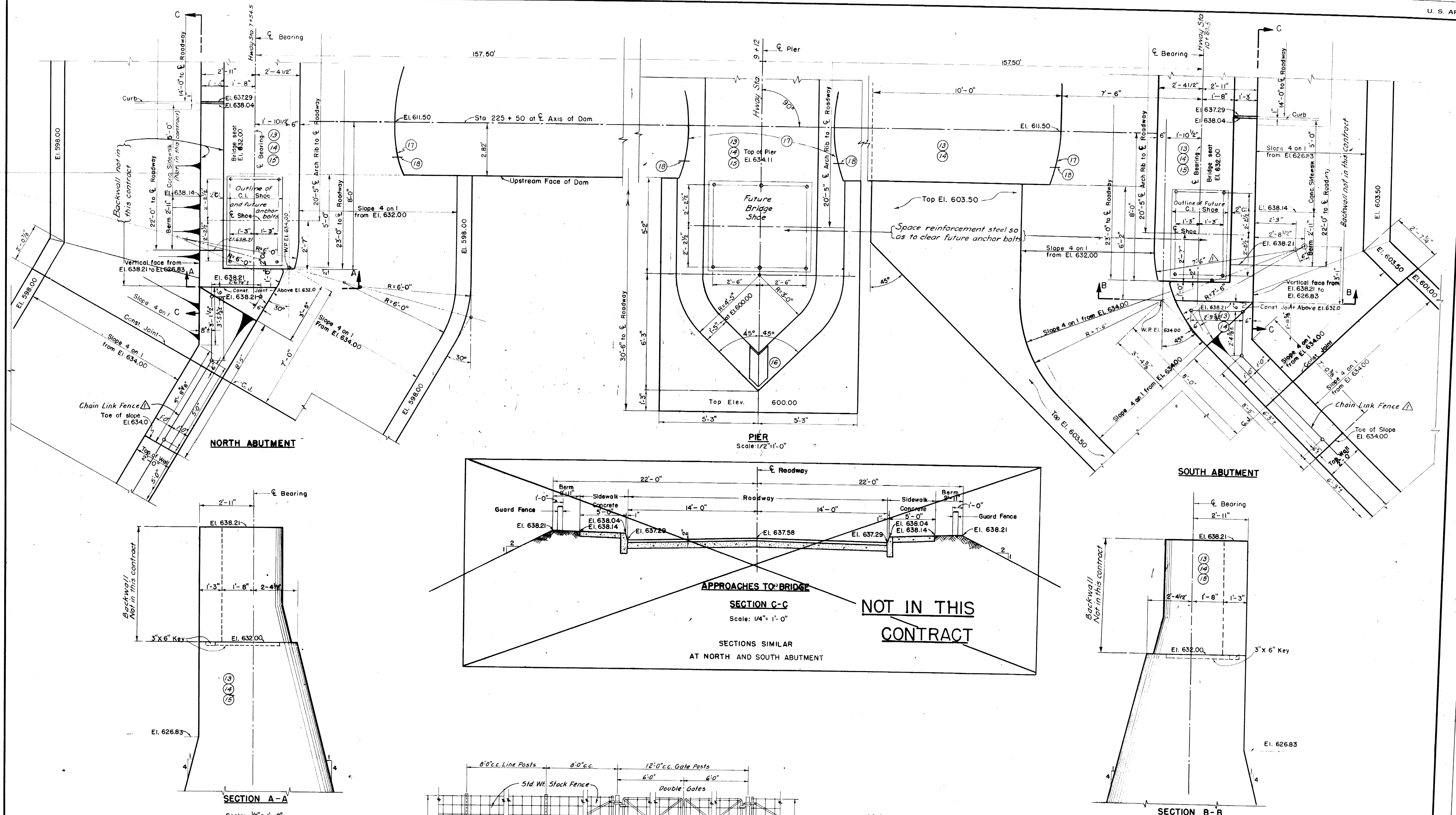
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

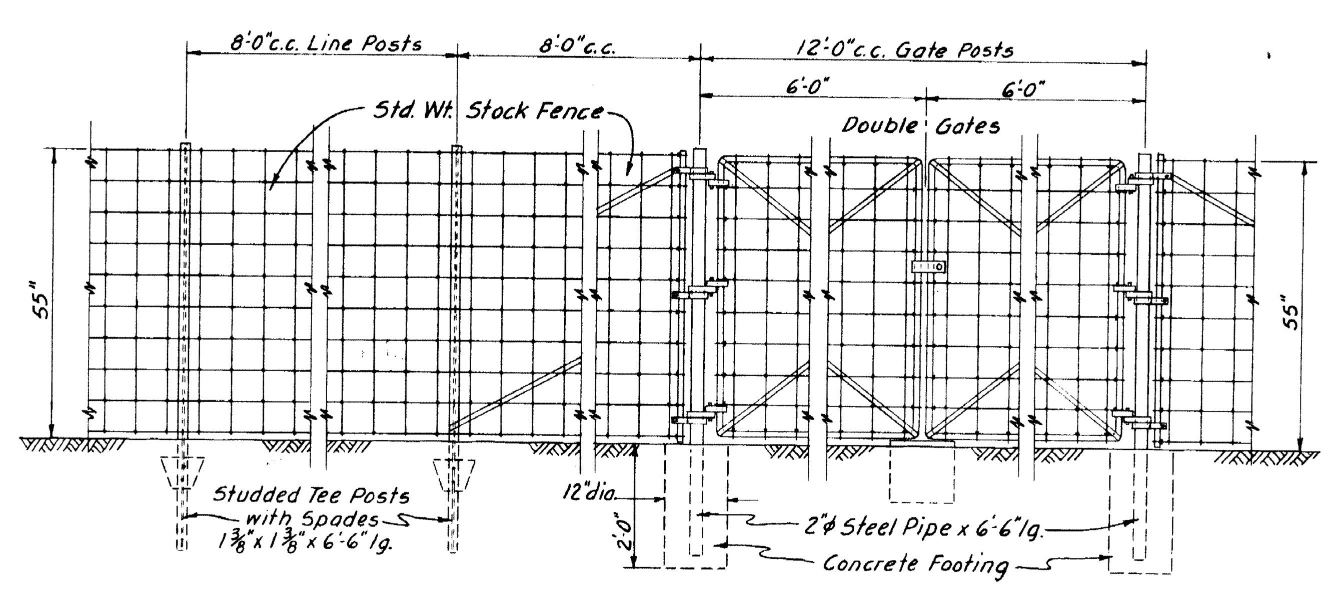
NORTH BRANCH POTOMAC RIVER INDUSTRIAL DAM

DETAILS OF SOUTH ABUTMENT

DRAWN BY: I.K.
TRACED BY: I.K. G.L.M.
CHECKED BY: J.Z. W.D.P.
SUBMITTED: P. Wadsworth
DATE: 7 NOV. 1952
SCALE AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.7
SHEET 7 OF 13

B-251-204.7





WIRE FENCE DETAIL
Scale: 1/2"-1'-0"

Notes:

For general notes see Index Sheet.
For details of abutments see sheets No 6 & 7
For details of spillway sections see sheet No. 9.
For location of Dam and Abutments see sheets No. 4 and 9

REVISION	DATE	DESCRIPTION	BY
2	1 Oct '54	As Built Changes; NONE	
1	12 May '53	Fence added to Wing Walls; Rad. Dim. changed	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

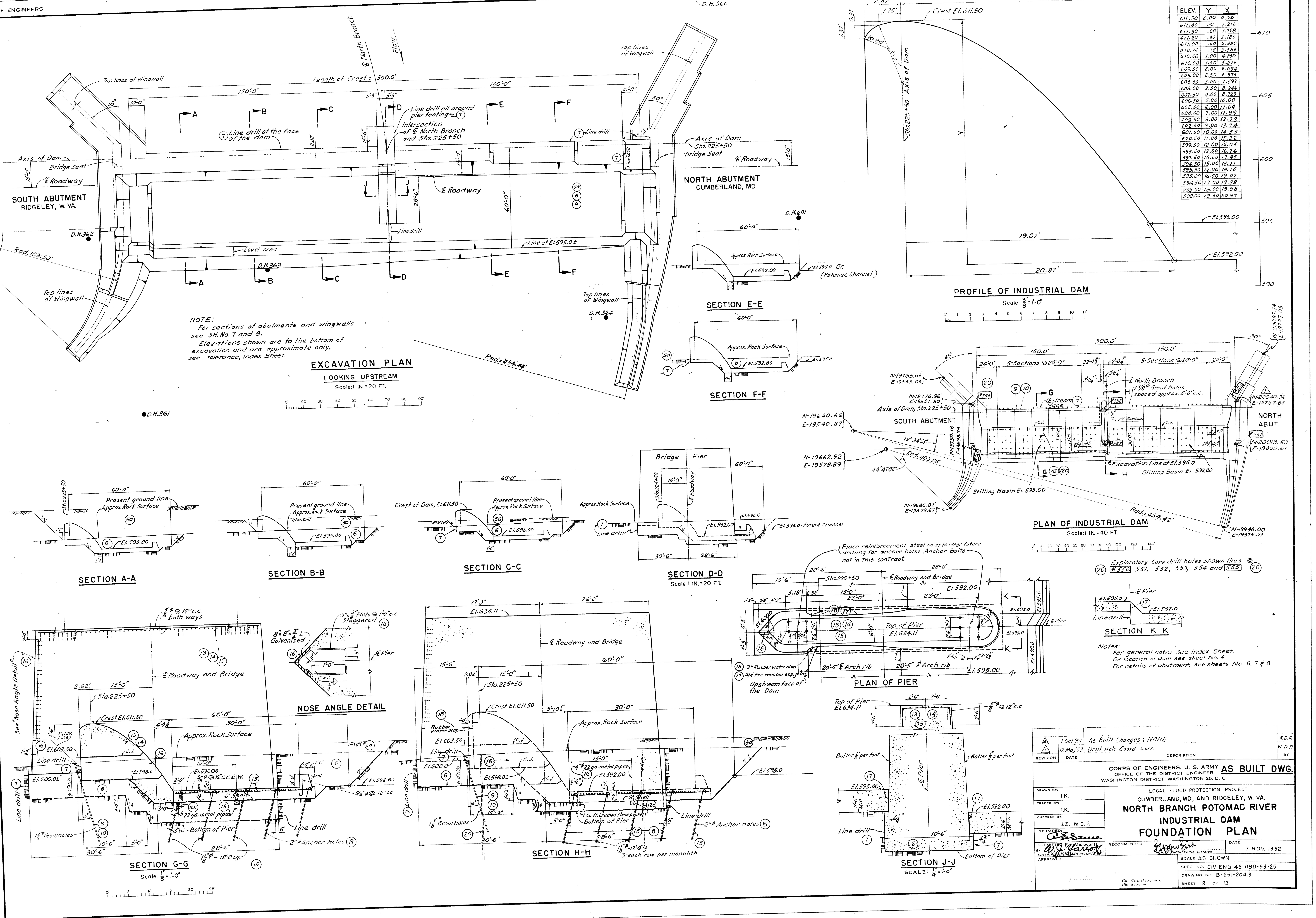
AS BUILT DWG.

DRAWN BY: I.K.
TRACED BY: R.T.R.
CHECKED BY: J.Z.
PREPARED:
SUBMITTED:
APPROVED:
RECOMMENDED:

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
DETAILS OF BRIDGE ABUTMENTS

Chief, Engineering Division
Col., Corps of Engineers, District Engineer

DATE 7 NOV. 1952
SCALE AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.8
SHEET 8 OF 12



ELEV.	Y	X
611.50	0.00	0.00
611.40	.10	1.216
611.30	.20	1.758
611.20	.30	2.185
611.00	.50	2.880
610.75	.75	3.586
610.50	1.00	4.190
610.00	1.50	5.216
609.50	2.00	6.094
609.00	2.50	6.875
608.50	3.00	7.597
608.00	3.50	8.246
607.50	4.00	8.729
606.50	5.00	10.00
605.50	6.00	11.04
604.50	7.00	11.99
603.50	8.00	12.73
602.50	9.00	13.74
601.50	10.00	14.55
600.50	11.00	15.32
599.50	12.00	16.05
598.50	13.00	16.76
597.50	14.00	17.45
596.50	15.00	18.11
595.50	16.00	18.75
595.00	16.50	19.07
594.50	17.00	19.38
593.50	18.00	19.98
592.00	19.50	20.87

Notes:
For general notes see Index Sheet.
For location of dam see sheet No. 4
For details of abutment, see sheets No. 6, 7 & 8

REVISION	DATE	DESCRIPTION	BY
4	1 Oct '54	As Built Changes; NONE	W.D.P.
1	12 May '53	Drill Hole Coord. Corr.	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

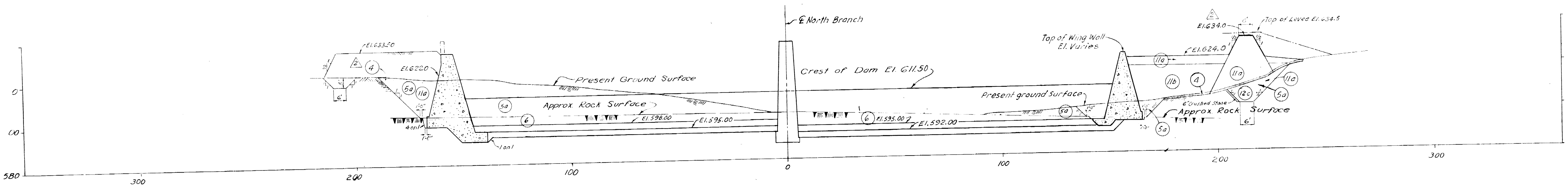
AS BUILT DWG.

DRAWN BY: I.K.
TRACED BY: I.K.
CHECKED BY: J.Z. W.D.P.
PREPARED: [signature]
SUBMITTED BY: R. L. Wadsworth, W. J. Yarcott [signature], CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED: [signature] CHIEF ENGINEERING DIVISION
APPROVED:
Col., Corps of Engineers, District Engineer.

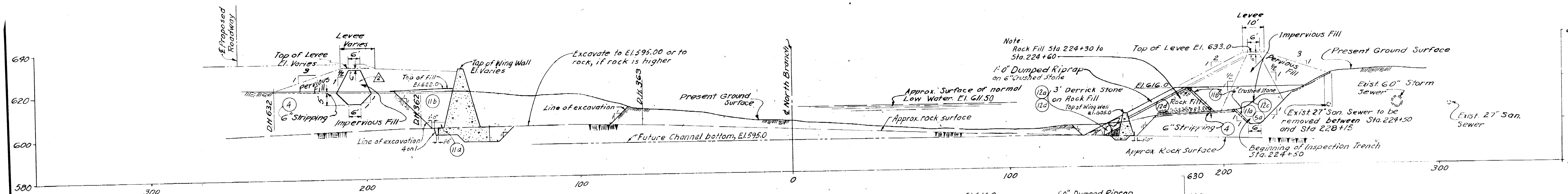
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD, AND RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
FOUNDATION PLAN

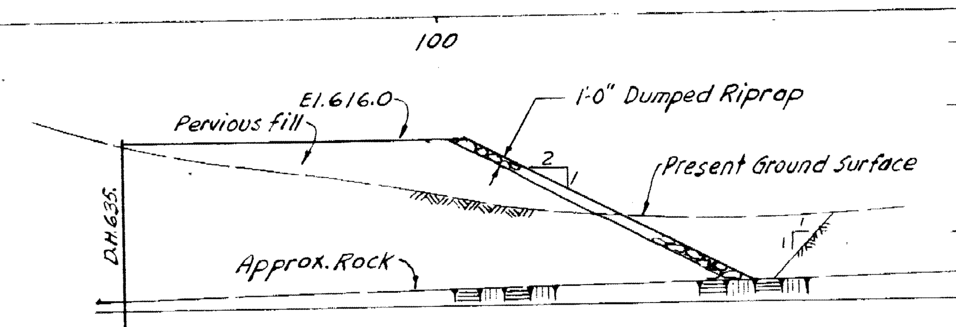
DATE: 7 NOV. 1952
SCALE AS SHOWN
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.9
SHEET 9 OF 13



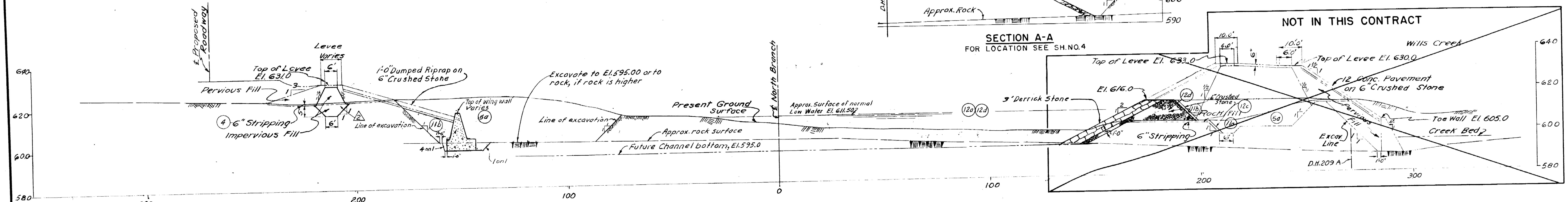
STA. 225+00



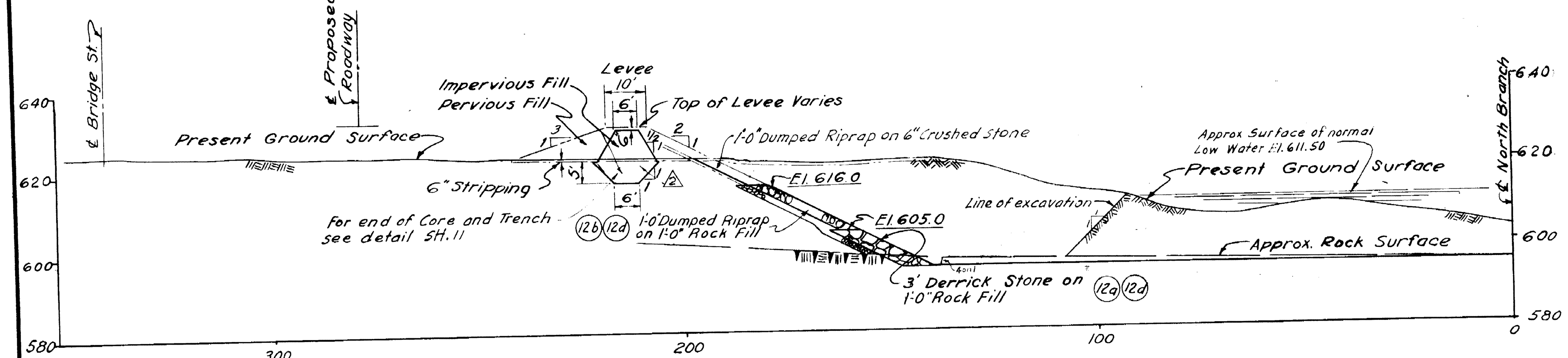
STA. 224+60



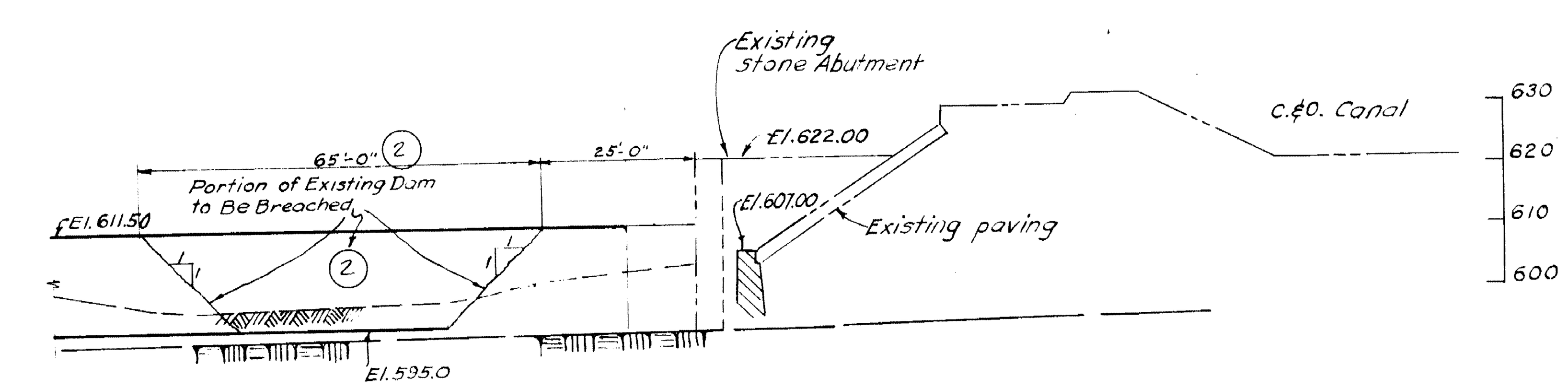
SECTION A-A
FOR LOCATION SEE SH. NO. 4



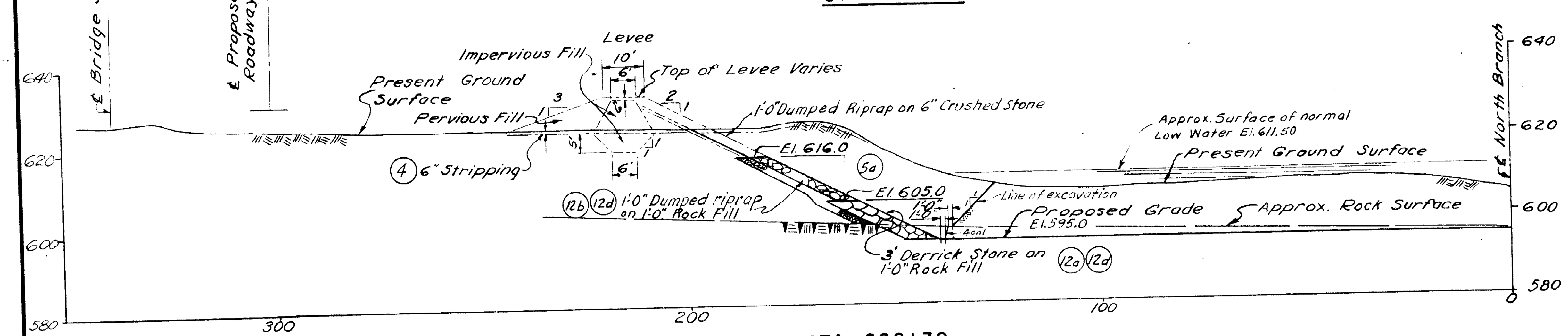
STA. 224+00



STA. 223+00



DETAIL OF C. & O. CANAL DAM



STA. 222+30

NOTES:
For General Notes see Index Sheet.
For location of sections see Sheet No. 4.
For additional sections see Sheet No. 11.
Levee sections shown in dashed lines are not included in this contract.
All Cross Sections taken looking up-stream

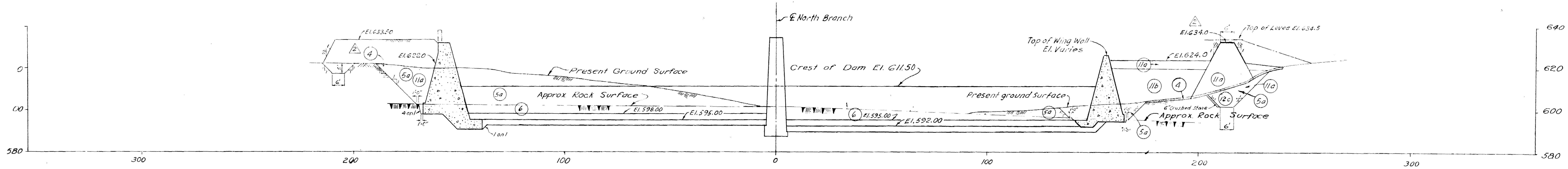
REVISION	DATE	DESCRIPTION	BY
4	1 Oct. '54	As Built Changes; NONE	W.D.P.
2	24 Mar. '54	Impervious Backfill Material added	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

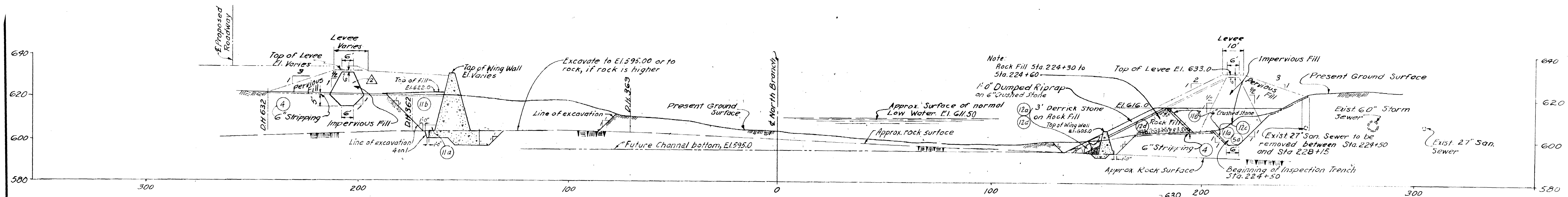
AS BUILT DWG.

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
SECTIONS 222+30 — 225+00

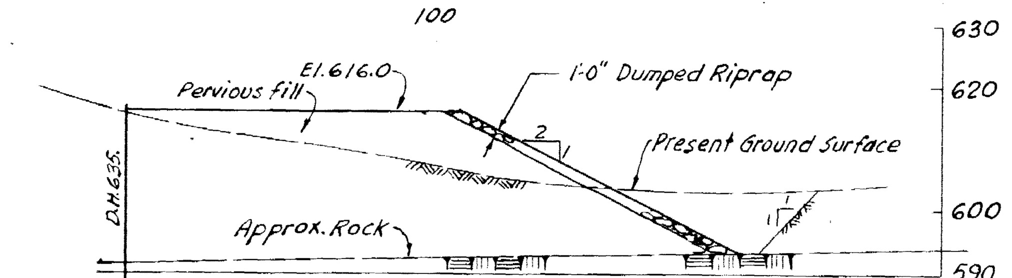
DRAWN BY: IK
TRACED BY: IK
CHECKED BY: J.Z.
PREPARED: [signature]
SUBMITTED BY: R. A. Wadsworth [signature] CHIEF, PLANNING AND REPORTS BR.
RECOMMENDED: [signature] CHIEF, ENGINEERING DIVISION
DATE: 7 NOV. 1952
APPROVED:
Col., Corps of Engineers, District Engineer.
SCALE 1" = 20'
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.10
SHEET 10 OF 13



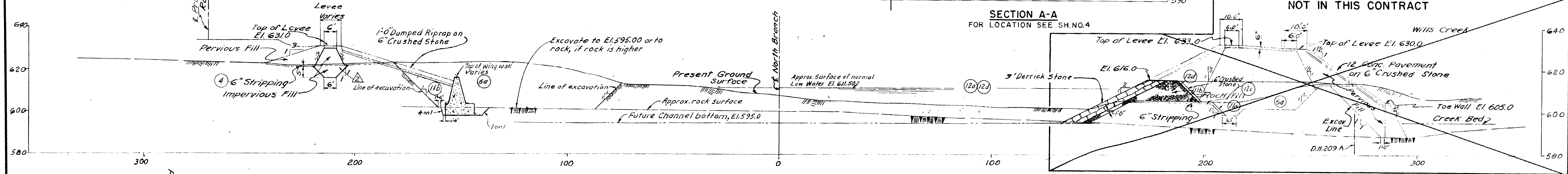
STA. 225+00



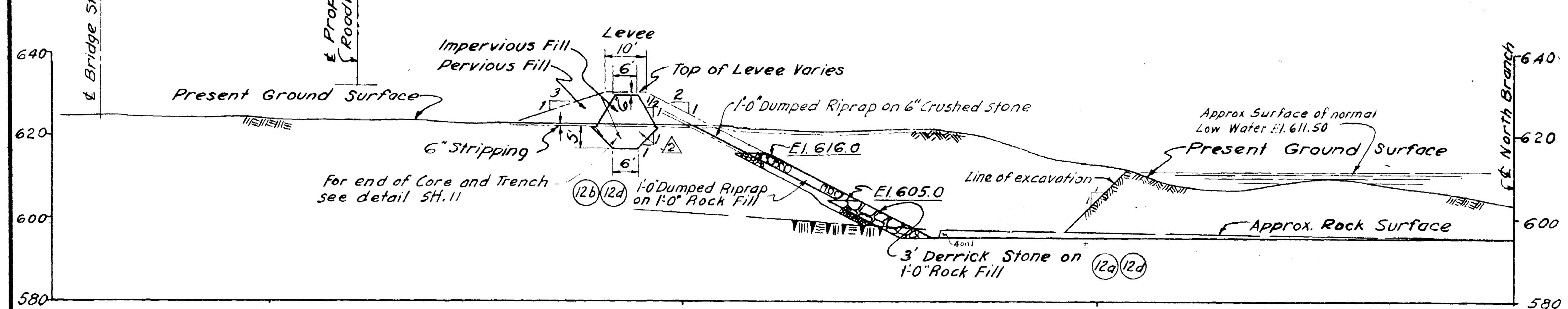
STA. 224+60



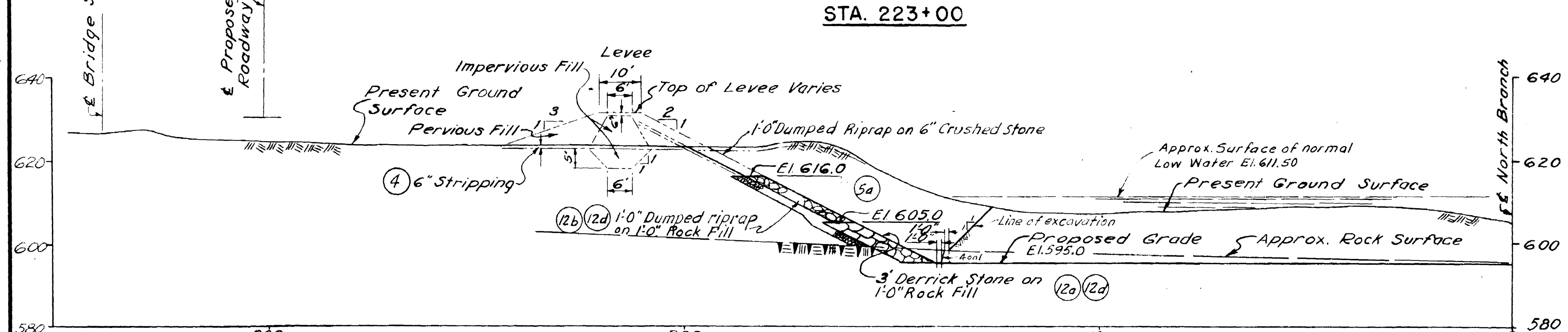
SECTION A-A
FOR LOCATION SEE SH. NO. 4



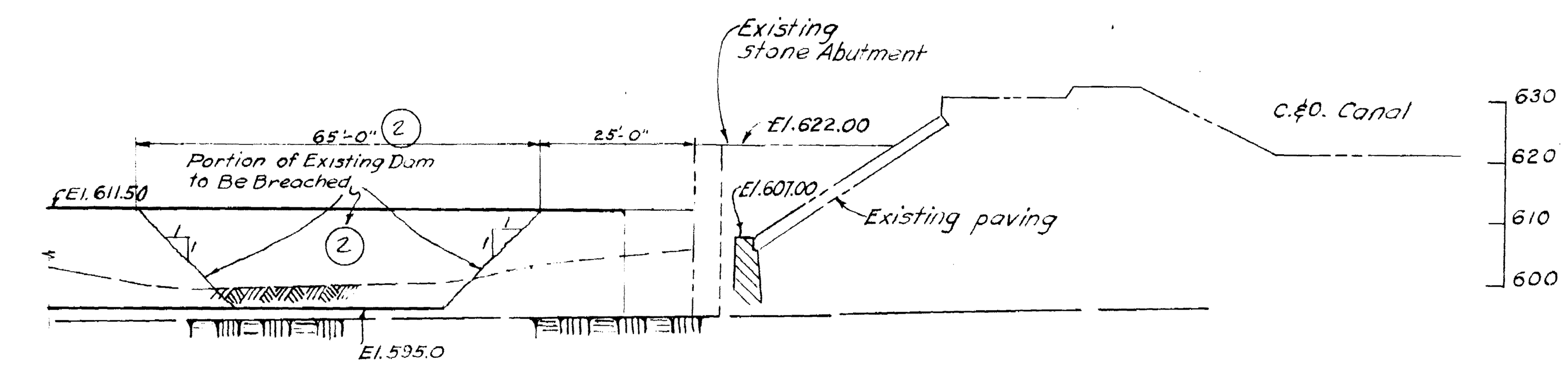
STA. 224+00



STA. 223+00



STA. 222+30



DETAIL OF C.&O. CANAL DAM

NOTES:
For General Notes see Index Sheet.
For location of sections see Sheet No. 4.
For additional sections see Sheet No. 11.
Levee sections shown in dashed lines are not included in this contract.
All Cross Sections taken looking up-stream

Revision	Date	Description	By
2	1 Oct. '54	As Built Changes; NONE	W.D.P.
1	24 Mar. '54	Impervious Backfill Material added	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

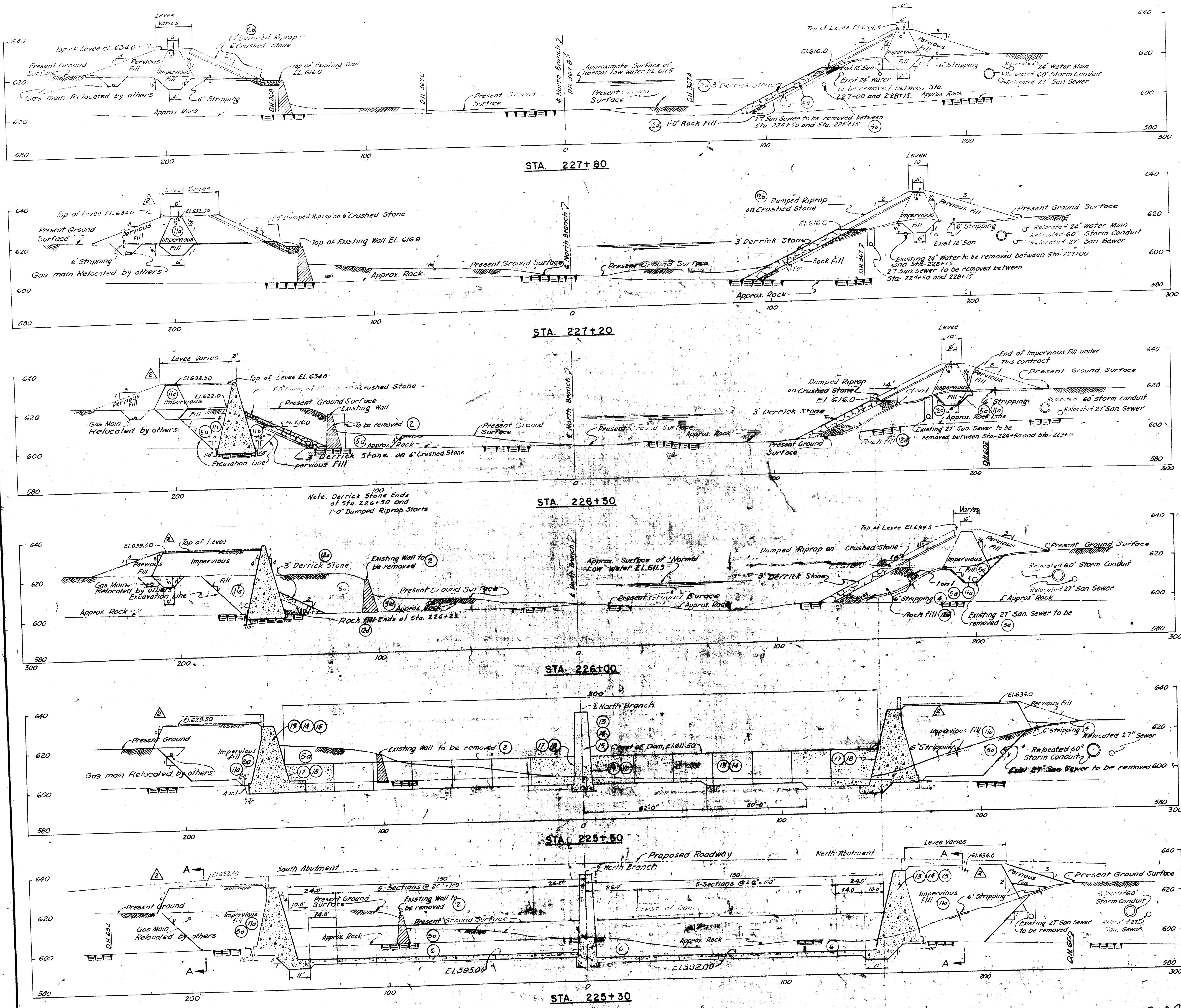
AS BUILT DWG.

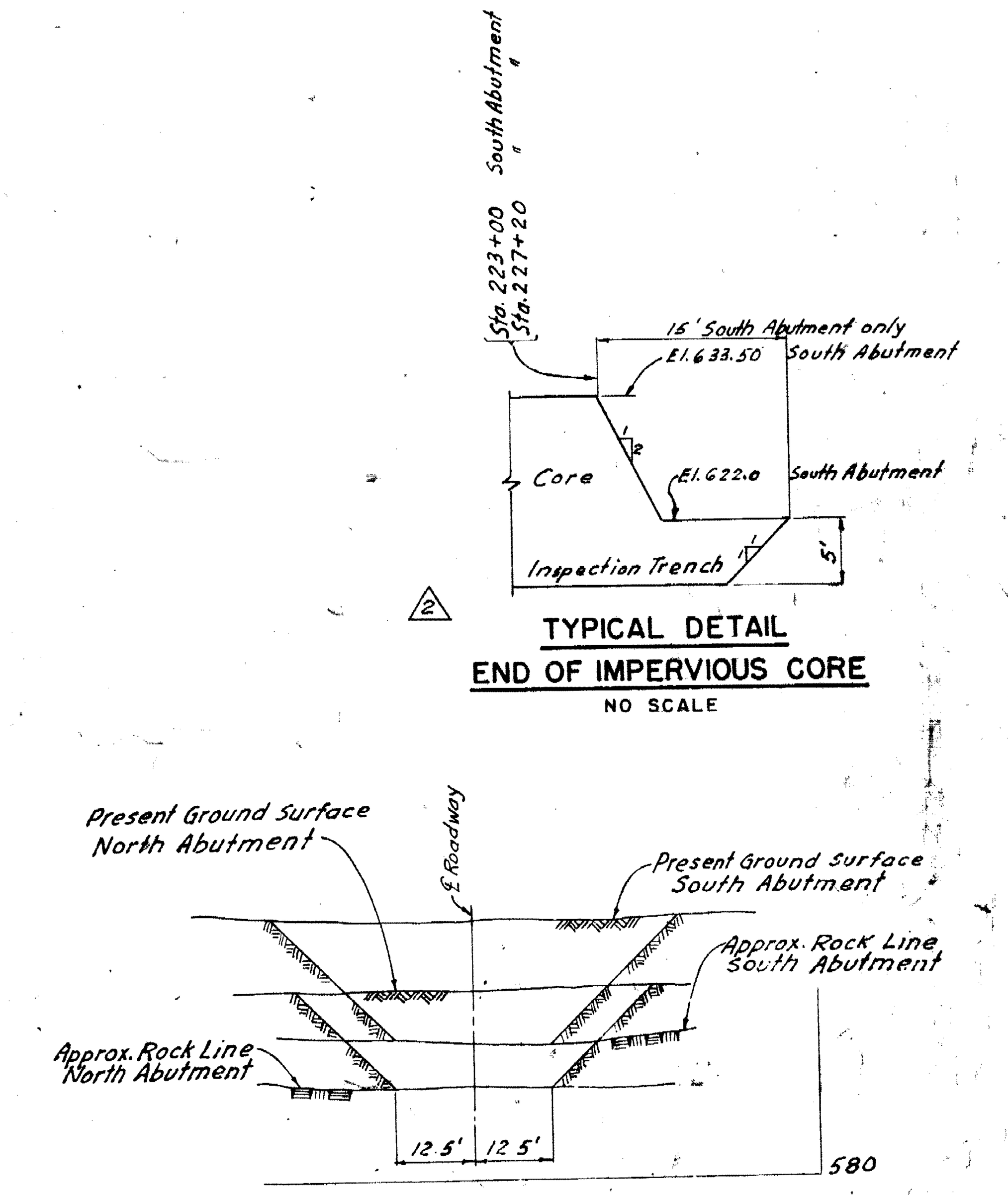
DRAWN BY: I K
TRACED BY: I K
CHECKED BY: J.Z.

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
SECTIONS 222+30 — 225+00

SUBMITTED: R.A. Wadsworth
RECOMMENDED:
APPROVED:
DATE: 7 NOV. 1952
SCALE: 1" = 20'
SPEC. NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.10
SHEET 10 OF 13

CORPS OF ENGINEERS





TYPICAL DETAIL
END OF IMPERVIOUS CORE
NO SCALE

SECTION A-A
CUT-OFF TRENCH

NOTES:
For General Notes see Index Sheet.
For location of sections see Sheet No. 4.
For additional sections see Sheet No. 10.
Levee Sections shown by dashed lines, are not included in this contract.
All Cross Sections taken looking up-stream

Revision	Date	Description	By
1	Oct '54	As Built Changes: NONE	W.D.R.
2	24 Mar '54	Impervious Backfill Material added	W.D.R.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

AS BUILT DWG.

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.
NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM
SECTIONS 225+30 — 227+80

DRAWN BY I.K.
TRACED BY I.K.
CHECKED BY J.Z.
DATE: 7 NOV. 1952
SCALE 1" = 20'
SPEC NO CIV ENG 49-080-53-25
DRAWING NO. B-251-204.11
SHEET 11 OF 13

B-251-204.11

NOTES:
For General Notes see Index Sheet.
For limits of work see Sheet No. 4.
For details of Abutments see Sheets No. 6, 7 and 8.
For Cross Sections see Sheets No. 10 and 11.

REVISION	DATE	DESCRIPTION	BY
4	1 Oct.'54	As Built Changes; NONE	W.D.P.
2	24 Mar.'54	℄ Levee W. Cumberland and E. Ridgeley added	W.D.P.
1	12 May'53	Control Coord. and Street name Corr.	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

AS BUILT DWG.

LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM

ALIGNMENT PLAN

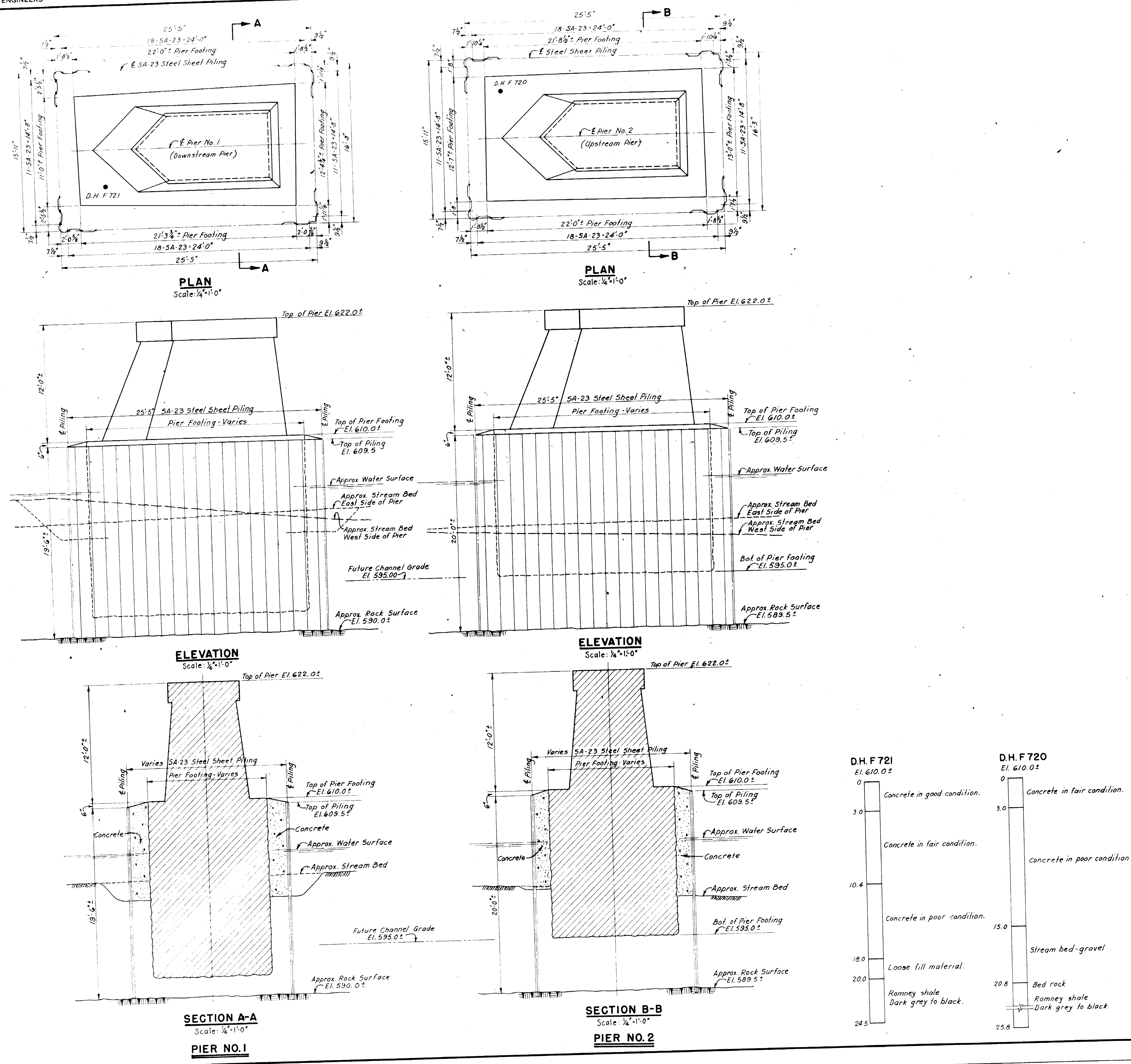
Drawn by: I.K. & G.L.M.
Traced by: I.K. & G.L.M.
Checked by: J.Z. & C.W.O.
Prepared: [signature]
Submitted by: R.L. Wadsworth, Chief, Planning and Reports Br.
Recommended: Chief, Engineering Division
Approved: [signature]

DATE: 7 NOV. 1952
SCALE: 1" = 50'
SPEC NO. CIV ENG 49-080-53-25
DRAWING NO. B-251-204.12
SHEET 12 OF 13

REVIEWED FOR SAFTEY BRANCH
SAFTEY ENGINEER

U. S. ARMY

CORPS OF ENGINEERS



NOTES:

All timber and loose material on the face of the existing piers shall be removed in order to obtain bond between new and existing concrete as directed by the contracting officer.

DA-27 steel sheet piling may be substituted for SA-23 steel sheet piling on pier No. 2 as directed by the contracting officer.

Excavate stream bed material adjacent to pier above elevation 600 before driving steel sheet piling to insure the placement of concrete fill to elevation 600 or below.

Steel sheet piling shall be driven to lines as shown into soft rock or as directed by the contracting officer.

Stream bed material should be backfilled against the outside of steel sheet piling as necessary before placing concrete to maintain clearances and reduce spreading or as directed by the contracting officer.

For location of piers No. 1 & 2 and approximate location of temporary cofferdam see general plan sheet No. 4.

Approximate depths of pier footings and rock surface determined by core borings drilled thru each pier footing on 14 June 1954 for pier No. 2 and 16 June 1954 for pier No. 1.

Revision	Date	Description	By
4	1 Oct '54	As Built Changes; NONE	W.D.P.
3	21 June '54	New Sheet	W.D.P.

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DISTRICT ENGINEER
WASHINGTON DISTRICT, WASHINGTON 25, D. C.

AS BUILT DWG.

Drawn by: G.L.M.
Traced by: M.M.H.
Checked by: W.D.P.
Reviewed for safety branch: J. J. Higgins
Prepared by: W. D. Phillips, Chief, Design Plans Section
Submitted by: R. C. Wadsworth, Chief, Planning & Reports Branch
Recommended: D. [signature]
Approved: Gray Adams, Col., Corps of Engineers, District Engineer

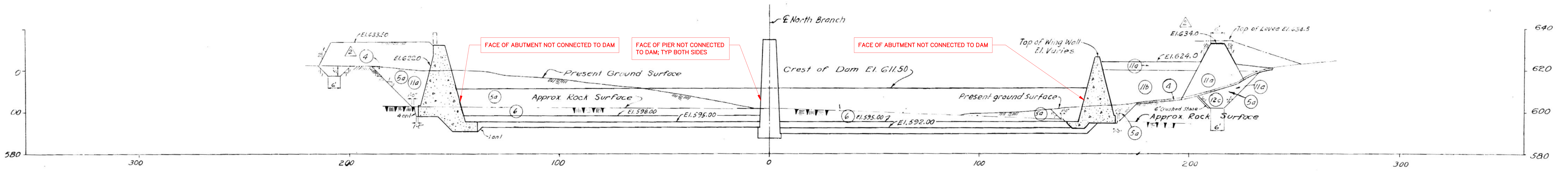
LOCAL FLOOD PROTECTION PROJECT
CUMBERLAND, MD. AND RIDGELEY, W. VA.

NORTH BRANCH POTOMAC RIVER
INDUSTRIAL DAM

PIER ENCASEMENT
PIERS NO. 1 & 2, W. M. RWY. BRIDGE NO. 1656

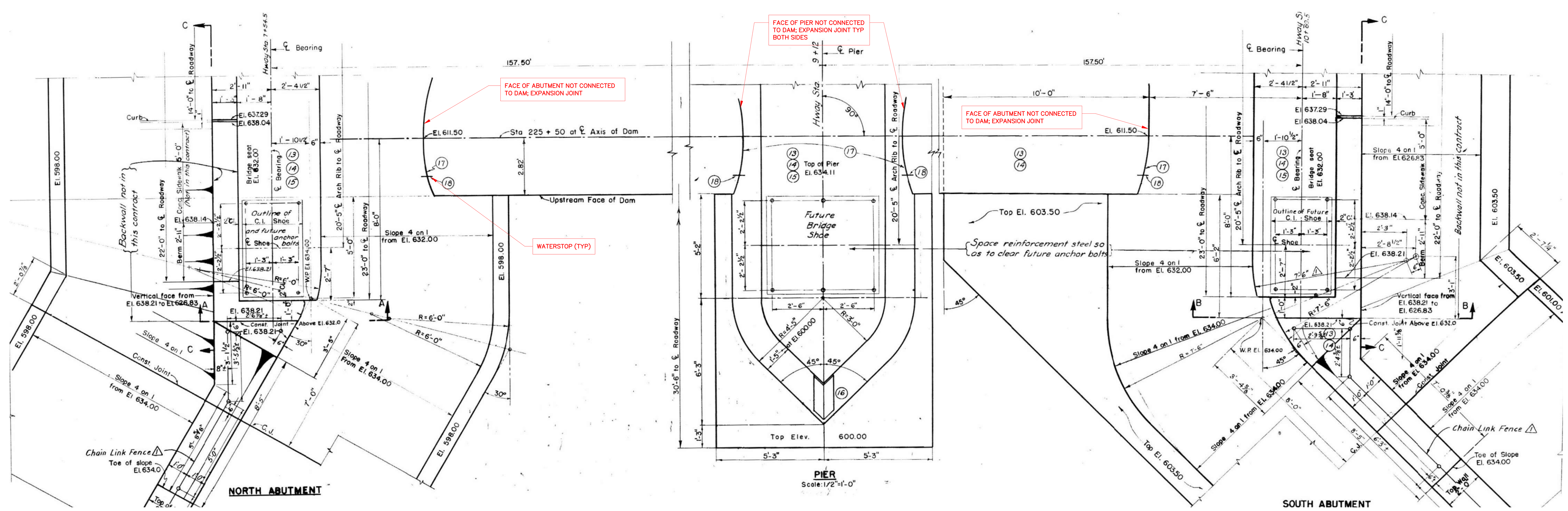
Scale: 1/4"=1'-0"
Spec. No.:
Date: 21 JUNE 1954
Drawing No. B-251-204.13
Sheet 13 of 13

B-251-204.13

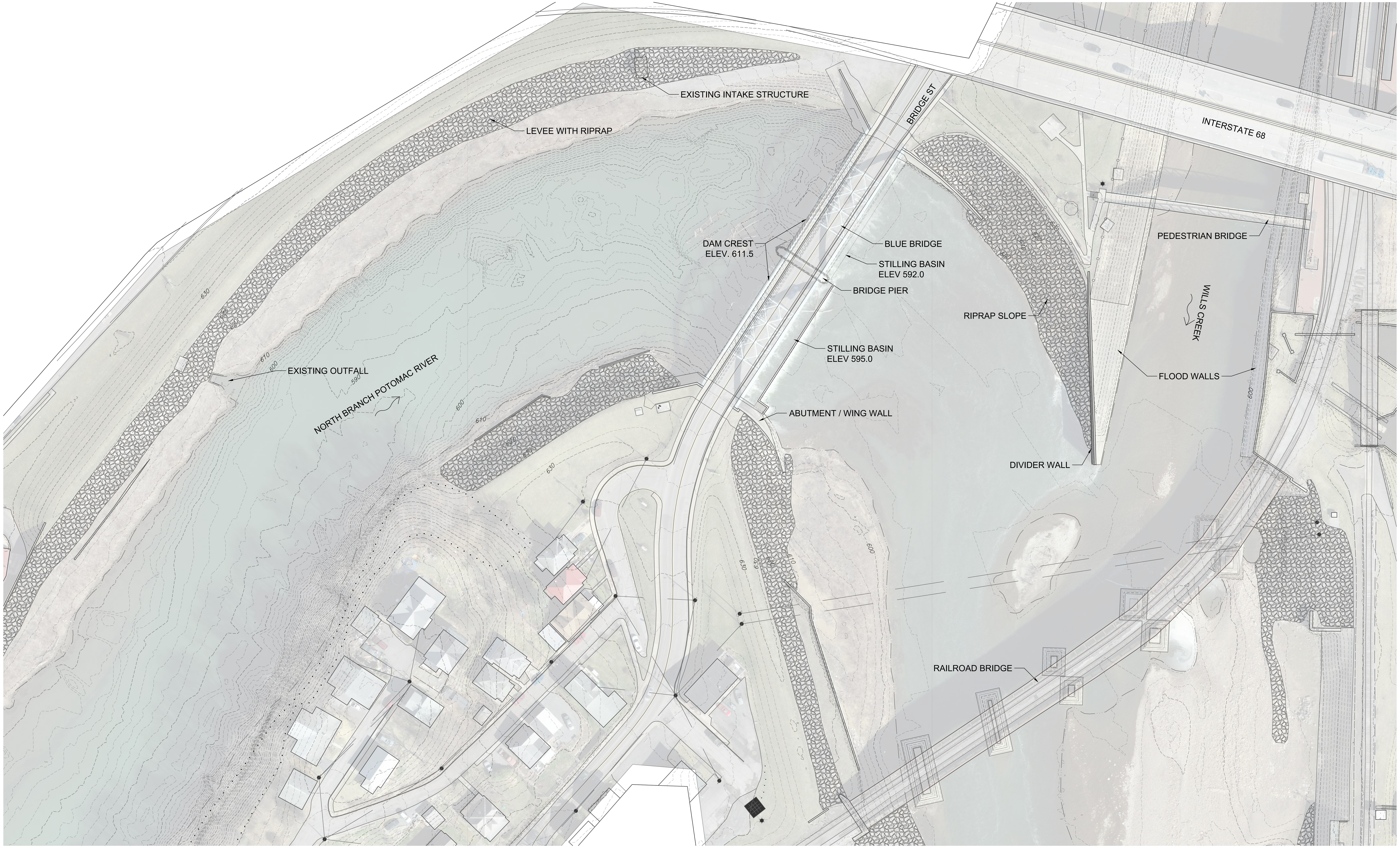


STA. 225+00

EXCERPT FROM "NORTH BRANCH POTOMAC RIVER INDUSTRIAL DAM SECTIONS 222+30 - 225+00" DRAWING NO. B-251-204.10; SHEET 10 OF 13; CORPS OF ENGINEERS, U.S. ARMY; 24 MARCH, 1954



EXCERPT FROM "NORTH BRANCH POTOMAC RIVER INDUSTRIAL DAM DETAILS OF BRIDGE ABUTMENTS" DRAWING NO. B-251-204.8; SHEET 8 OF 12; CORPS OF ENGINEERS, U.S. ARMY; 12 MARCH, 1953



EXISTING PLAN VIEW

N

SCALE BAR 1"=50'

50 0 50

CONTOUR INTERVAL 2FT

Recreation Engineering & Planning

RECREATION ENGINEERING
AND PLANNING
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERPARKS.COM

DRAFT

PROJECT OWNER:
CITY OF CUMBERLAND

RIVERPARK AT CANAL PLACE
NORTH BRANCH POTOMAC RIVER
CUMBERLAND, MD

EXISTING PLAN VIEW

REVISIONS:

NO.	DATE

DESIGNED: ML DRAFTED: SL

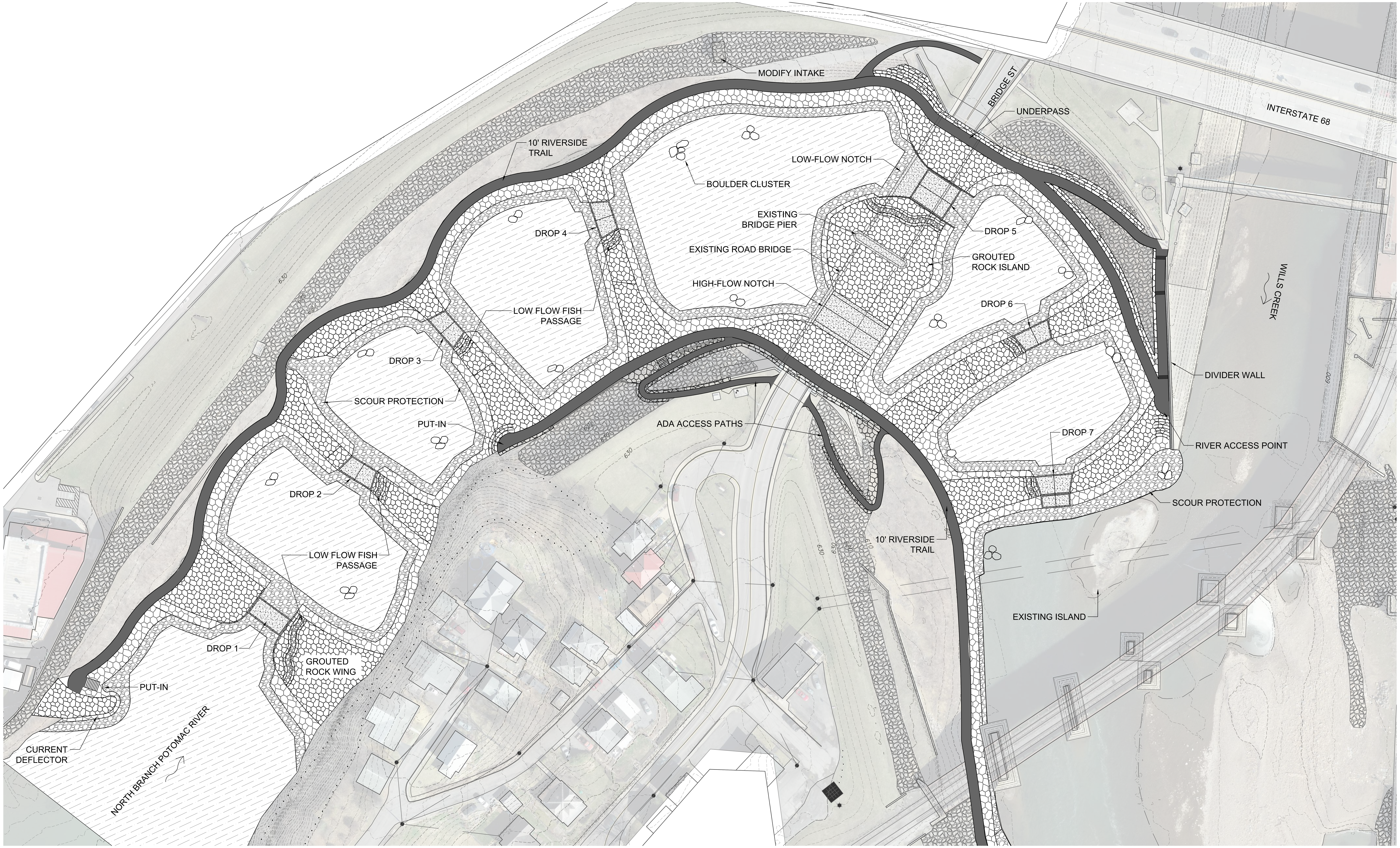
CHECKED: ----

PLOT DATE: 1/10/2024

DRAWING NO.

01

SHEET 01 OF 07



PROPOSED PLAN VIEW UPSTREAM

N

SCALE BAR 1"=50'

50 0 50

CONTOUR INTERVAL 2FT

RECREATION ENGINEERING AND PLANNING
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERPARKS.COM

DRAFT

PROJECT OWNER:
CITY OF CUMBERLAND

RIVERPARK AT CANAL PLACE
NORTH BRANCH POTOMAC RIVER
CUMBERLAND, MD

PROPOSED PLAN VIEW

REVISIONS:

NO.	DATE
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DESIGNED: ML DRAFTED: SL

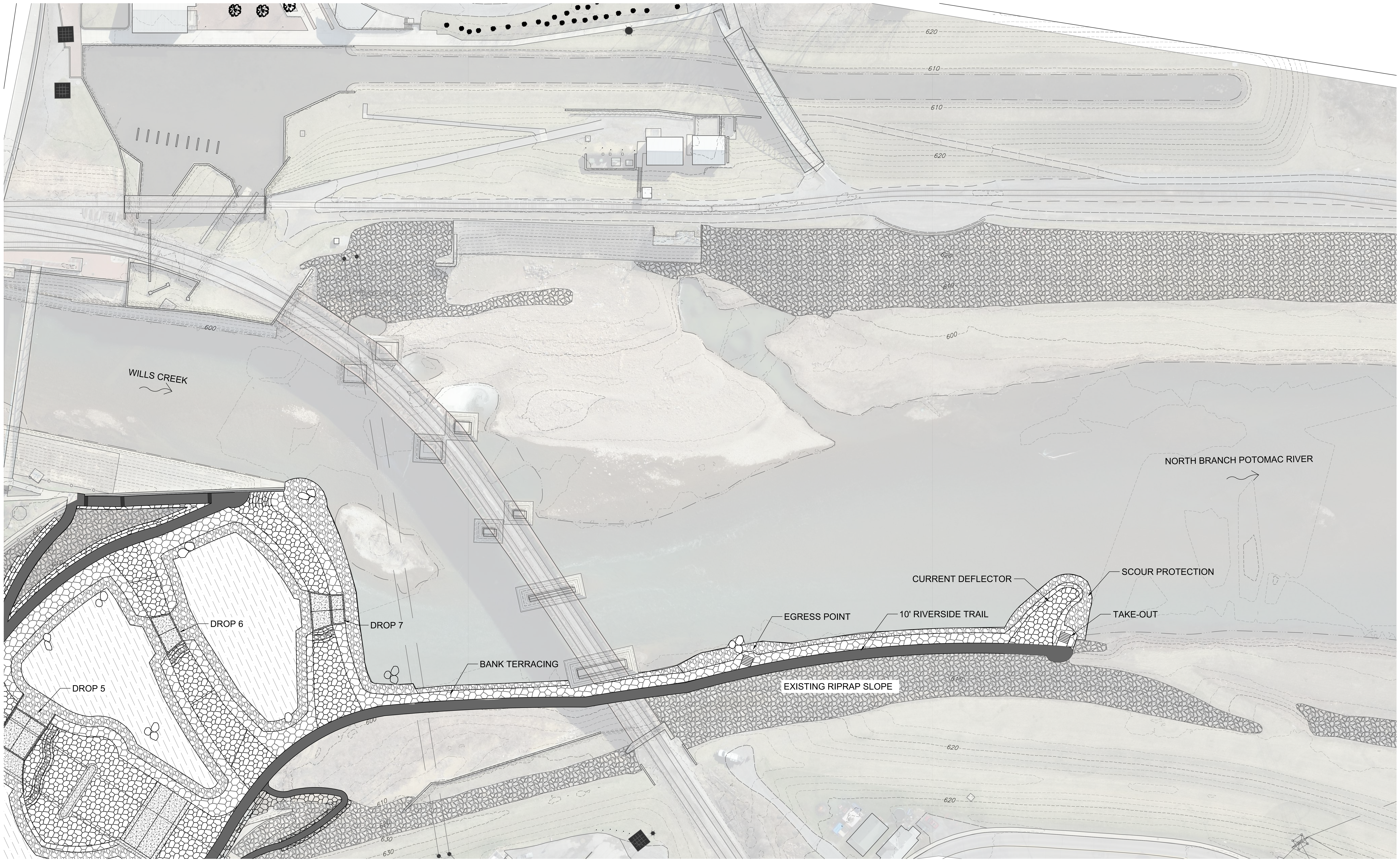
CHECKED: ----

PLOT DATE: 1/10/2024

DRAWING NO.

02

SHEET 02 OF 07



PROPOSED PLAN VIEW DOWNSTREAM

SCALE BAR 1"=50'
50 0 50
CONTOUR INTERVAL 2FT

RECREATION ENGINEERING AND PLANNING
485 ARAPAHOE AVE.
BOULDER | CO | 80302
WWW.BOATERPARKS.COM

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PROJECT OWNER:
CITY OF CUMBERLAND

RIVERPARK AT CANAL PLACE
NORTH BRANCH POTOMAC RIVER
CUMBERLAND, MD

PROPOSED PLAN (2)

REVISIONS:

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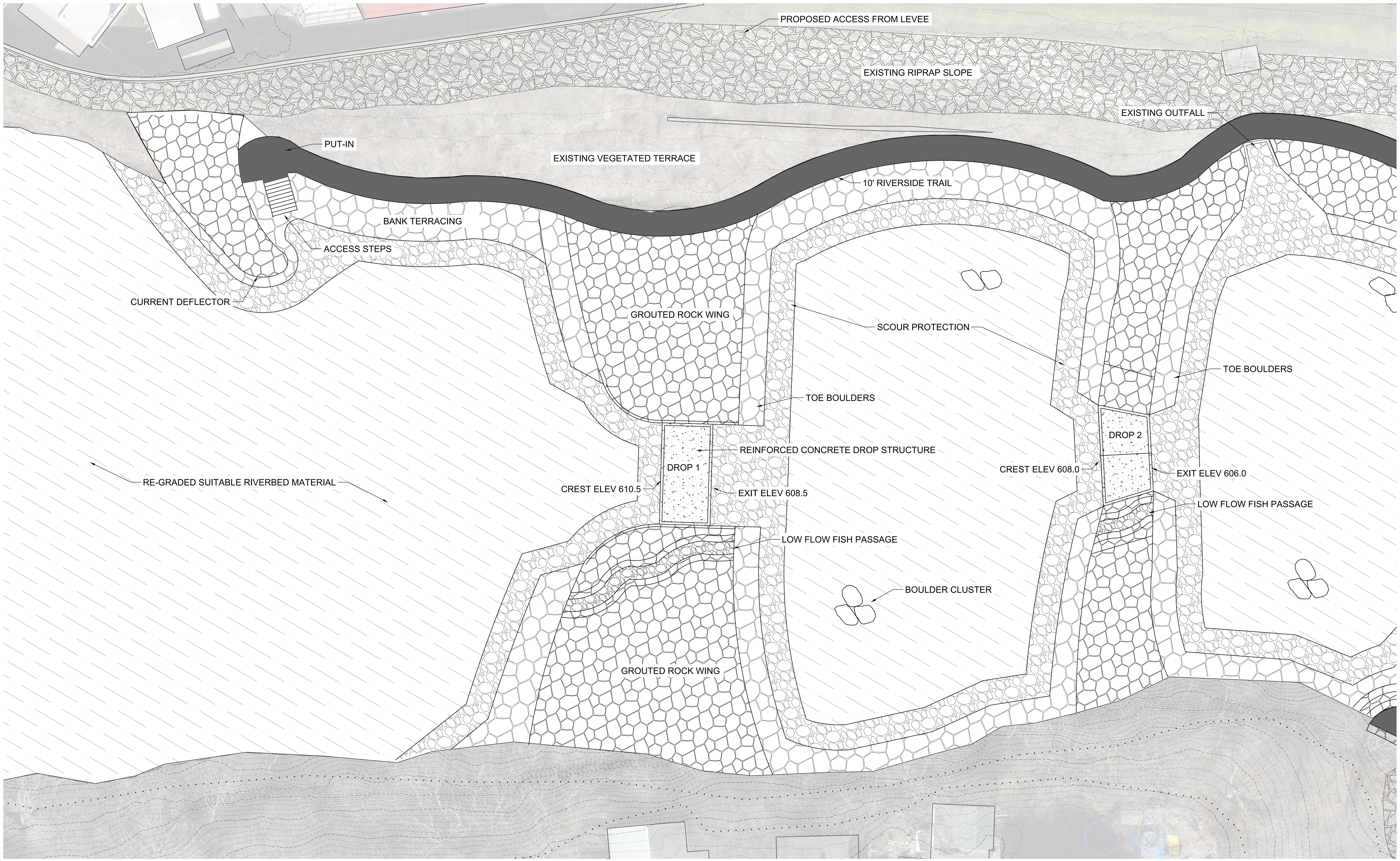
DESIGNED: ML DRAFTED: SL
CHECKED: ----
PLOT DATE: 1/10/2024

DRAWING NO.
03

SHEET 03 OF 07



PROPOSED PLAN VIEW UPSTREAM

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

Recreation Engineering & Planning

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PROJECT OWNER:
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RIVERPARK AT CANAL PLACE
NORTH BRANCH POTOMAC RIVER
CUMBERLAND, MD

UPSTREAM PLAN VIEW

REVISIONS:

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DESIGNED: ML DRAFTED: SL
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PLOT DATE: 1/10/2024

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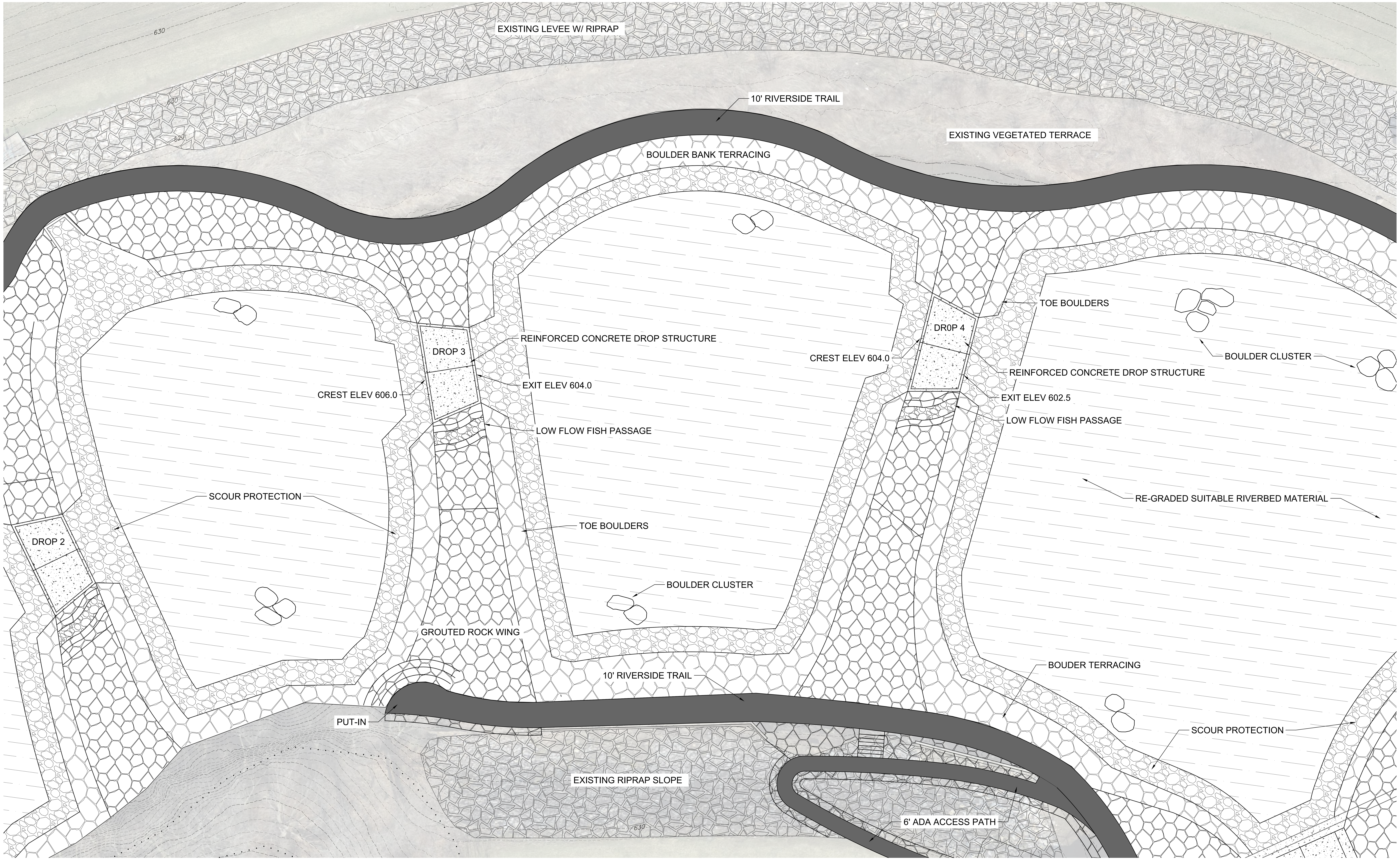
04

SHEET 04 OF 07



PROPOSED PLAN VIEW MID-SECTION

N

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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PROJECT OWNER:
CITY OF CUMBERLAND

RIVERPARK AT CANAL PLACE
CUMBERLAND, MD
NORTH BRANCH POTOMAC RIVER

MID-SECTION PLAN VIEW

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PLOT DATE: 1/10/2024

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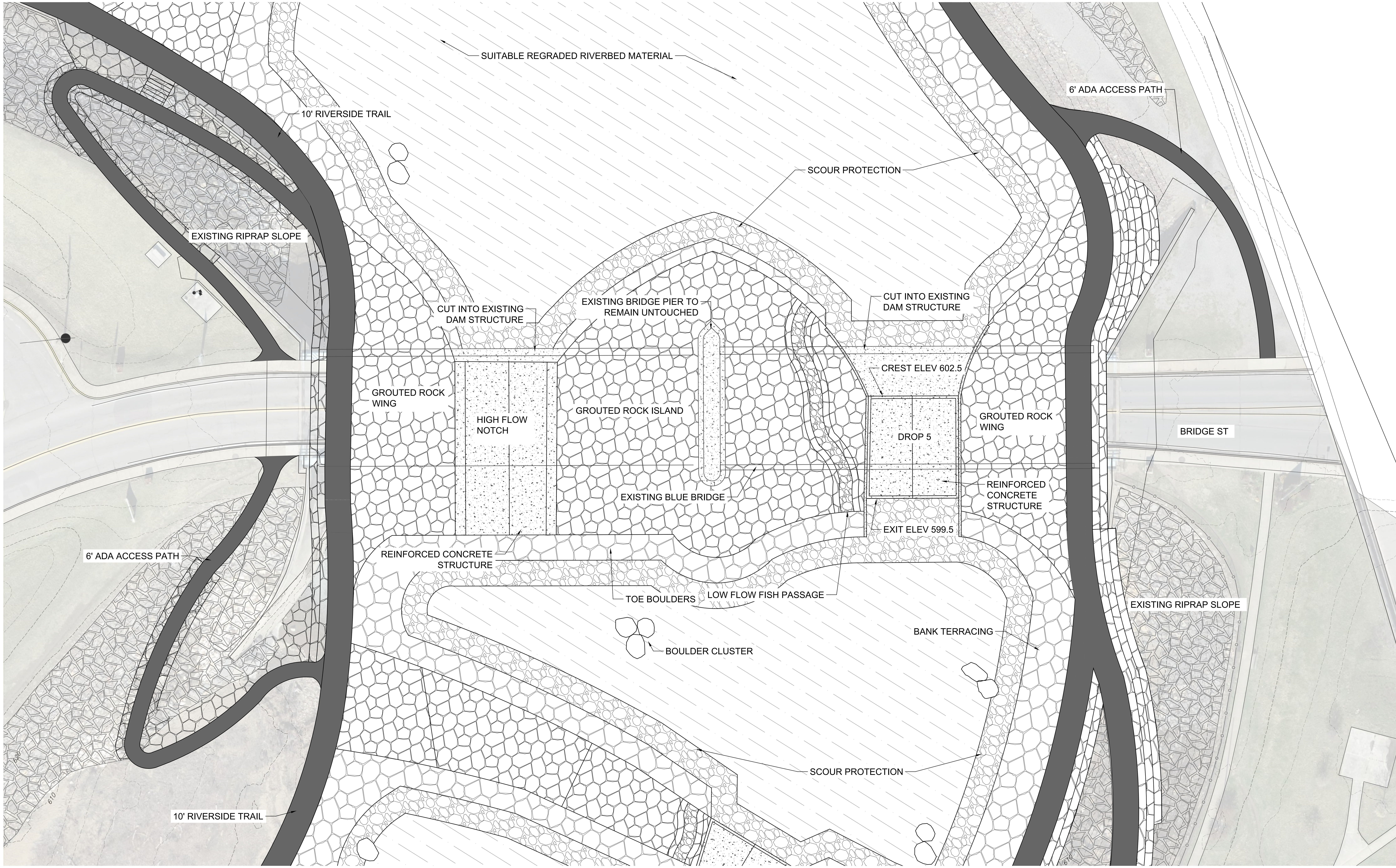
05

SHEET 05 OF 07



PROPOSED PLAN VIEW DAM MODIFICATION

SCALE BAR 1"=20'
20 0 20
CONTOUR INTERVAL 2FT

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PROJECT OWNER:
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RIVERPARK AT CANAL PLACE
NORTH BRANCH POTOMAC RIVER
CUMBERLAND, MD

DAM MOD PLAN VIEW

REVISIONS:

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DESIGNED: ML DRAFTED: SL
CHECKED: ----
PLOT DATE: 1/10/2024

DRAWING NO.
06

SHEET 06 OF 07

PROPOSED PLAN VIEW CONFLUENCE

SCALE BAR 1"=20'

20 0 20

CONTOUR INTERVAL 2FT

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PROJECT OWNER:
CITY OF CUMBERLAND

RIVERPARK AT CANAL PLACE
CUMBERLAND, MD
NORTH BRANCH POTOMAC RIVER

CONFLUENCE PLAN VIEW

REVISIONS:

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PLOT DATE: 1/10/2024

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07

SHEET 07 OF 07