HISTORIC AMERICAN ENGINEERING RECORD

EVERGREEN POINT FLOATING BRIDGE
(Governor Albert D. Rosellini Bridge—Evergreen Point)
HAER No. WA-201

Location:	**Spanning Lake Washington at State Route (SR) 520, King County, Washington** The Governor Albert D. Rosellini Bridge – Evergreen Point, commonly known as the Evergreen Point Bridge, is located on State Route (SR) 520 in Seattle, King County, Washington. It stretches from the Montlake area of Seattle east across Lake Washington to the Evergreen Point area in Medina. The 1.4-mile-long floating portion of the bridge forms the center portion of a 5.8-mile expanse connecting the two main north-south highways in the greater Seattle area, Seattle's Interstate 5 and Interstate 405 on the east side of Lake Washington. Coordinates at center point are Latitude, 47.6403764; Longitude, -122.2592912.
Construction Dates:	1960-1963
Designers:	Charles E. Andrew, Ken Arkin, Mike Thomas: Washington State Toll Bridge Authority (WSTBA)
Builder:	The Guy F. Atkinson Company, San Francisco
Owner:	State of Washington
Significance:	The Evergreen Point Bridge is significant for its innovative engineering and design. It is also notable for its lasting effect on the development of the Seattle metropolitan area, where the bridge provides easy access for commuters travelling between Seattle and the communities east of Lake Washington. The bridge paved the way for increased suburban development to support population expansion. The Evergreen Point Bridge is part of a regionally important transportation corridor and one of only two bridges that cross Lake Washington. The bridge was financed by a $30,000,000 revenue bond, approximately $5,000,000 in Federal aid, and contributions from King County, making it the most expensive floating bridge in the world at the time. [1]

[1] Prahl, Charles G., Washington State Highway Commission, Department of Highways: Thirtieth Biennial Report 1962-1964.

The bridge, having had few substantial visual alterations over its lifetime, appears today much as it did when completed in 1963.

Project Information: Documentation of the Evergreen Point Floating Bridge was undertaken by the Federal Highway Administration and the Washington State Department of Transportation in 2010 as partial mitigation for planned demolition of the structure. The bridge is planned for replacement because it is vulnerable to catastrophic failure. Large format photography was produced by Jet Lowe of the National Park Service. The written narrative history was prepared by Connie Walker Gray, Gray Lane Preservation and Planning, with contributions by Lori Durio Price and Megan Venno, CH2M HILL, 2011.

INTRODUCTION

At the time of its construction in 1963, the Evergreen Point Bridge was the longest floating concrete bridge in the world. Measuring 1.4 miles from the Montlake area of Seattle across Lake Washington to Medina, the bridge formed the center portion of the 5.8-mile project connecting the two main north-south highways in the greater Seattle area, Seattle's Interstate 5 and Interstate 405 on the east side of Lake Washington. It was built as a four-lane toll bridge to provide easy access to and from Seattle for communities on the east side of Lake Washington (locally known as "the Eastside"), such as Bellevue, Kirkland, and Redmond.

The concept of a new floating bridge across Lake Washington was met with resistance from some members of the public, but it quickly became a popular commuting route between Seattle and the Eastside after construction. While the bridge eased traffic, it also stimulated growth of the suburbs throughout the 1970s and 1980s. By 2011, the bridge carried approximately 115,000 cars per day, far exceeding the 65,000 it was designed to carry.

For safety reasons, the bridge is closed during major storms and high winds. Wind-induced wave loads are an issue because they threaten the structural integrity of the floating bridge. Currently, the pontoons supporting the bridge float about one foot lower than originally designed, increasing the likelihood of waves breaking onto the bridge deck. The aging structure has required patching and repairs over the years. A limited seismic retrofit was completed on the approach structures in 1999, but the bridge remains at risk of collapse in an earthquake because the west and east approaches rest on hollow piles that do not meet current seismic design standards. The bridge is scheduled to be replaced by a new floating bridge in 2014.

BACKGROUND AND HISTORICAL CONTEXT

The Puget Sound region, particularly the urban areas of Seattle and what is commonly known as the "Eastside" – communities east of Lake Washington including Bellevue, Medina, Hunts Point, Yarrow Point, Clyde Hill, Kirkland, Redmond, and many others – was in large part developed because of the numerous deep ports, rivers, and fresh water lakes, which provide connectivity and support maritime commerce. Water is a ubiquitous feature in the region. Inhabitants of the Puget Sound region have long been tasked with crossing and navigating the area's numerous waterways, whether by hand-carved canoes, ferries, pleasure craft, or bridges. The history of the Evergreen Point Bridge is consistent with the theme of the Puget Sound region, and is described below. The planning and construction of the Evergreen Point Bridge was a mid-century solution to the ongoing challenge of providing an efficient and effective crossing to Lake Washington.

Transportation and Mobility in Western Washington

Water transportation has had a profound impact on the historical development of Western Washington. Multiple bodies of water, including the Pacific Ocean, Puget Sound, and in the Seattle area, Lake Washington and Lake Union, both enhance and restrict transportation. Lake

Washington, which is 20 miles long and 4 miles across at its widest point, represents the eastern boundary of Seattle. The Lake is connected to the Puget Sound and ultimately to the Pacific Ocean and beyond, by way of the Lake Washington Ship Canal. The area served by the Evergreen Point Bridge and SR520, from I-5 to the eastern shore of Lake Washington, includes some of the most diverse and complex human and natural landscapes in the Puget Sound region. The geography includes densely developed urban and suburban areas and some of the most critical natural areas and sensitive ecosystems that remain in the urban growth area.[2]

King County has faced transportation challenges since its inception in 1853, beginning in a time when roads did not exist, and goods and people were transported via the many waterways. One of the first licenses granted by the fledgling county was for the operation of a ferry across the Duwamish River. A major priority for the City of Seattle was access not only to Puget Sound and the Pacific Ocean, but also to the Cascade Mountains and beyond – a need that would be served by this new ferry boat.[3]

As early as 1859, the territorial legislature unsuccessfully called for the U.S. Congress to build a viable road over Snoqualmie Pass, which would ease the transport across the mountains and would secure Seattle's position as an economic hub. Taking matters into their own hands in 1865, citizens of Seattle explored the Pass and raised $2,500 to fund construction of the first wagon road from Ranger's Prairie (now North Bend) over the summit. Passage remained difficult, but momentum for improvements and upgrades continued due to the dedication and hard work of local residents. In 1866, King County and the Territorial Assembly both appropriated funds for the project, and by 1867 travel time over the pass had been substantially reduced.[4] Development continued, though the road remained primitive. In 1909, more than 150 cars travelled over the summit. The Snoqualmie Pass Highway was formally dedicated in 1915, but it was not until the winter of 1930-31 that it remained open during the winter for the first time.[5]

Crossing Lake Washington

In the late nineteenth and early centuries, transport of people and goods across Lake Washington continued to be by water, using canoes, boats, barges, and ferries.[6] These vessels moved everything from people and animals, to gravel and lumber, from one side of the lake to the other. Hundreds of vessels navigated this water body every day. One of the earliest vessels to make regular runs across the lake was the flat-bottomed steam scow, the *Squak*, built in 1880. The 41' *Squak* transported people and goods across the lake until it sank in 1890. Its captain, Frank

[2] Washington State Department of Transportation and Federal Highway Administration, *SR 520, I-5 to Medina: Bridge Replacement and HOV Project Final Environmental Impact Statement and Final Section 4(f) and 6(f) Evaluations (FHWA-WA.EIS-06-06-F) June 2011.*
[3] Washington State Highway Commission (WSHC) and Washington Toll Bridge Authority (WTBA), The Lake Washington Floating Bridge Roanoke Expressway and Sections of the Seattle Freeway Official Opening Program, August 28, 1963.
[4] Prater, Yvonne, *Snoqualmie Pass: From Indian Trail to Interstate*,The Mountaineers, 198, 43-44.
[5] WSHC and WTBA 1963.
[6] WSHC and WTBA 1963.

Curtis, and his sons then commissioned construction of the 60' ship the *Elfin*, which by 1891 operated between Yarrow Bay, Kirkland, and the base of Madison Street in Seattle.[7]

By the start of the 20th century, there were a multitude of boats crossing the lake, including a double-ended public ferry, the *King County of Kent*, operated by the King County Port Commission. In 1915, the steam ferry *Lincoln* began service between the base of Madison Street and Kirkland, with a capacity of fifty vehicles.[8] Several regular routes were established as Seattle and the surrounding communities grew; these routes originated in Leschi Park and sailed to Juanita, Houghton, and Kirkland. Other routes carried passengers and cargo between Leschi and East Seattle-Mercer Island, Meydenbauer Bay, and other points eastward.[9,10]

Although Lake Washington was highly valued as a recreational destination for local residents, it continued to be an obstacle for automobile traffic. There were no bridges to facilitate car travel between Seattle and the Eastside, and cars to and from the city had to travel either north or south of the lake, using local branches of Primary State Highway 2. This was a slow, circuitous route via the Bothell Branch on the north and the Renton Branch on the south. The southern route alone involved 26 miles of stop-and-go traffic, partially through residential neighborhoods. In 1937, the branches joined to continue over Snoqualmie Pass as one highway. [11]

Meanwhile population growth on the Eastside was gradual, but slow. The area was mostly rural; the towns were small. Farmers grew berries and raised poultry. Industry included the Lake Washington shipyards and a small sash and door establishment. Some residents commuted to Seattle for work. Generally Eastside development centered on the Seattle residents who could afford summer and weekend homes on the lake, boasting impressive views and water access.[12]

It was within this setting that development of the Eastside began to take hold with an eye toward a direct highway connection to Seattle. Several potential bridge crossings were suggested as early as 1926. During the early 1930s, King County and Eastside developers such as Miller Freeman mounted a campaign for bridge construction.[13]

Lacey V. Murrow Bridge (Lake Washington Floating Bridge): the First Floating Bridge

The idea for a bridge across Lake Washington began to take hold during the late 1920s. Proponents of a bridge across the lake had been stymied by several challenges: the width of the lake (1½ miles across at the narrowest section), the expense of building piers for a bridge of this length, and the soft mud at the bottom of the lake. A young engineer with the Seattle Public

[7] Alan J. Stein, "The ferry *Leschi* makes it last run, ending ferry service on Lake Washington on August 31, 1950," 2000, in Online Encyclopedia of Washington State History, available at HistoryLink.org, accessed October 15, 2011.
[8] Stein, 2000.
[9] Venno, Megan, Determination of Eligibility of Three Sunken Vessels, Lake Washington (On file at the Department of Archaeology and History Preservation) 2006.
[10] WSHC and WTBA 1963.
[11] WSHC and WTBA 1963.
[12] WSHC and WTBA 1963.
[13] McDonald, Lucille, *Bellevue: Its First 100 Years,* Bellevue Historical Society, 2000.

School Architect's office, Homer Hadley, first had the idea for a floating pontoon bridge in 1920. His idea—a bridge constructed with hollow concrete barges connected end to end, supporting a deck roadway—would solve several of these challenges.

On October 1, 1921, he presented his idea to a meeting of the American Society of Civil Engineers.[14] However, his proposal was initially considered preposterous and was met with strong resistance for years. Furthermore, his affiliation with the Portland Cement Company, whose motto was "to extend and promote the uses of concrete," both bolstered Hadley's confidence in a concrete bridge and caused some to question his motives.[15] It was not until the creation of the Washington State Toll Bridge Authority, and with the support of Lacey V. Murrow, the Director of the State Highway Department, that Hadley's plan took shape.[16]

Construction on the Lake Washington Floating Bridge, later named the Lacey V. Murrow Bridge, commenced on January 1, 1939, eighteen years after the idea had first been presented to the American Society of Civil Engineers. The bridge opened on July 2, 1940, to great fanfare, and immediately provided a passable connection between the Eastside and Seattle. With its tied arch approach and the Art Deco-styled east portals of the Mount Baker tunnel, the floating bridge was considered both technologically and architecturally distinctive.

After opening, the Lacey V. Murrow Bridge soon exceeded its expected capacity of 20,000 cars per day.[17] Removing the tolls in 1949 triggered a rapid upsurge of traffic, from 10,370 vehicles per day in 1948 to 17,884 per day in 1950; this resulted in traffic volumes much higher than the expected 15,000 per day, projected for the first full year of operation. As early as 1949, the Department of Highways—the precursor to the Washington State Department of Transportation – undertook "fact-gathering" studies to determine the need and feasibility for a second bridge across Lake Washington.[18] Between 1950 and 1960, the population of the Eastside's suburbs increased by nearly 88 percent.[19] Additionally, population growth within the Seattle metropolitan area at large experienced an 11 percent growth between 1950 and 1955 alone.[20]

Alan J. Stein, "The ferry *Leschi* makes it last run, ending ferry service on Lake Washington on August 31, 1950," 2000, in Online Encyclopedia of Washington State History, available at HistoryLink.org, accessed October 15, 2011.

[14] Esser, Phillip Seven, "Hadley, Homer (1885-1967), Engineer, Essay 5419," 2003, in Online Encyclopedia of Washington State History, available at HistoryLink.org, accessed October 15, 2011.
[15] Esser, 2003.
[16] Holstine, Craig and Richard Hobbs, *Spanning Washington: Historic Highway Bridges of the Evergreen State (* WSU Press), 2005, 169.
[17] Holstine and Hobbs, 2005, 174.
[18] "Opening Culminates 10 Years' Planning: Success of First Bridge Spurs Demand for Second" *Daily Journal of Commerce (DJC),* August 27, 1963.
[19] Holstine and Hobbs 2005, 174.
[20] DeLeuw, Cather & Company, *Report on Second Lake Washington Bridge Location: Engineering Studies and Estimates, (*Prepared for the Washington State Toll Bridge Authority, Olympia) July 1956.

Need for a Second Floating Bridge

Beginning in 1946, citizens in Seattle and the Eastside began calling for a second floating bridge across Lake Washington. The need for an additional Lake Washington crossing was recognized by the Washington State Legislature in the passing of Chapter 192, session laws of the State of Washington in 1953 to require a second crossing which would be financed by revenue bonds supported by tolls from the Lacey V. Murrow Bridge.[21] By 1960 over 50,000 cars per day were crossing the Lacey V. Murrow Bridge, resulting in major traffic delays and accidents.[22] Originally, the State Toll Bridge Authority planned to design and construct a second trans-Lake Washington bridge by 1956, but that date was delayed considerably as a result of public opposition.

The location for the new bridge became a contentious issue. Six sites were originally considered as bridge locations. The location alternatives were reviewed by the Seattle Planning Commission, the Toll Bridge Authority, the Seattle Engineering Department, the King County Planning Commission and the various Lakeside communities.[23] All potential sites had advocates and opponents. However, early on, two of these sites were determined most viable: the Montlake-Evergreen Point route and a route between Sand Point Naval Air Station and Kirkland.[24]

Throughout the early 1950s, neighborhood groups, particularly from Montlake and Madison Park, and representatives from the Arboretum Foundation held meetings with the Washington State Toll Bridge Authority, submitted signed petitions, and wrote editorials in local newspapers in opposition of the Montlake-Evergreen Point route. These groups had concerns about disruptions to the neighborhoods, impacts to the Arboretum, and held the perspective that Seattle neighborhoods would suffer as a result of the Eastside's desire for a new bridge.[25] Conversely, many of the lake's north-end communities favored the route between Sand Point Naval Air Station and Kirkland, in hopes of bringing more traffic and activity to their business districts. Further, the Seattle Planning Commission issued a report in 1955 that recommended the Sand Point-Kirkland route for the second floating bridge (Washington State Highway Department, 1963). However, the U.S. Navy opposed this route, unless it would include extensive restrictions, which would make the route considerably more expensive and difficult to build than the Montlake-Evergreen Point route. After ongoing consultation between then Washington State governor Arthur B. Langlie and representatives from the Navy, and despite ongoing opposition from neighborhood and advocacy groups, it was determined that the Montlake-Evergreen Point route would be the most feasible from the transportation, financial, and engineering perspectives.[26]

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[21] De Leuw, Cather & Company 1956.
[22] Holstine and Hobbs, 2005, 174.
[23] "Opening Culminates 10 Years' Planning," *DJC*, 1963.
[24] Cunningham, Ross, "New Lake Washington Bridge Certain – But at Which Site?" *The Seattle Times,* October 19, 1954.
[25] Nelson, Stub, "Arboretum is Hostile to Second Bridge Site Plan" *Seattle Post-Intelligencer*, September 25, 1953
[26] Nelson, 1953.

The west approach of the proposed Montlake-Evergreen Point route would bisect the Washington Park Arboretum, south of the Montlake Cut. Moving west from the floating portion, the approach route would continue along Edgewater Park, cross Foster Island and the Washington Park Arboretum to Montlake Boulevard, and then follow the southern shoreline of Portage Bay. The new bridge would require a connection to the Interstate 5 at Roanoke, construction of the Montlake and R.H. Thompson interchanges, construction of the freeway between Mercer Street and NE 75th, as well as east and west approaches (DJC 1963).[27]

Designing the Evergreen Point Bridge

In the mid-1950s, a team of bridge engineers was assembled to begin planning and designing the bridge. These included Chief Consulting Engineer for the project Charles E. Andrew, with Clark Eldridge, Ray M. Murray, and L.R. Durkee. Charles C. Nichols was the Toll Facilities Engineer. The Project Engineer was Harold S. Sitzman, and the Resident Engineer was John C. Tucker.[28] The contracts for the floating bridge portion of the project were open to bid on March 24, 1959. Bidding at $10.9 million, the Guy F. Atkinson Company of San Francisco won the floating bridge contract. At the same time, contracts for the east and west structural approaches were awarded to General Construction Company and the Manson Engineering Company, and the illumination and signage contract was awarded to the Van S. McKenny Company and Fentron Industries.

Following contract awards, construction was delayed due to legal issues. William H. Davis of Seattle contended the Washington State Toll Bridge Authority had made an illegal extension to the construction contract for 17 months while seeking sufficient financial arrangements, and also asserted that substantial and recommended project changes were made without being reflected in the contract. The Washington State Toll Bridge Authority maintained that the changes were minor.[29] The final obstacle to construction was overcome on August 22, 1960, when Thurston County Superior Court Judge Charles T. Wright dismissed the case against the State.

Bridge Financing

Construction of the bridge was financed by the $30,000,000 revenue bond approved by the Washington State Toll Bridge Authority, as well as approximately $5,000,000 in Federal aid, and contributions from King County,[30] substantially more than the original price tag.[31] It was the most expensive floating bridge in the world at the time.[32] The Washington State Toll Bridge Authority Resolution No. 341 authorized the issuance of the revenue bond on January 1, 1960. The bond was used to obtain construction funds for the bridge and approaches. The bond

[27] "Opening Culminates 10 Years' Planning," *DJC*, 1963.
[28] WSHC and WTBS 1963.
[29] "By Court: Suit Against Lake Bridge Thrown Out, Judge Orders Dismissal" *Seattle Post-Intelligencer,* August 23, 1960.
[30] Prahl, 1964.
[31] "Mud to Raise Cost of 2nd Floating Span" 1955.
[32] Holstine and Hobbs 2005, 174-6.

included, but was not limited to, "costs of survey, acquisition of rights-of-way, design, engineering" and to pay interest on the bonds during construction and during the first six months of tolling. The bonds also included repayment of money earlier appropriated by the Motor Vehicle Fund for preliminary work and design. [33]

Constructing the Bridge

Construction commenced on August 29, 1960. The design and field headquarters for engineers working on the bridge was located at the University of Washington's campus, near the University Shell House (aka Canoe House). The discovery of deep mud off Madison Park during boring added to the cost of the bridge.[34] The mud required extensive dredging and backfilling, but did not change the design of the bridge. The pontoons, superstructures, and "Type B" and "Type C" anchors were manufactured at a Seattle graving dock, located at 5500 SW Marginal Way. "Type A" anchors were formed and poured at the Pioneer Sand and Gravel Company on Lake Union. Once the pontoons were formed at the graving dock, the tendons were post-tensioned with jacks and were then placed throughout the full length of the pontoons in flexible tubes. This work was done by a subcontractor, the Soule Steel Company. Once the pontoons were completely built at the graving dock, they were towed and stored at Kennydale Moorage on the eastern shore of Lake Washington in Renton.[35]

Some of the machinery for the center draw span was installed at the graving dock, and the remaining machinery was installed in the final bridge configuration. The bridge anchors were transported to the site, lowered, and jetted into place by March 15, 1963. The floating portion of the bridge was assembled during the summer of 1963. The west lift span steel was erected on June 10 of that year, and the east span steel was erected shortly thereafter. By August 7, 1963, the pontoons were lined up and towed into place, with the movable pontoons (M and N) the last to be placed and bolted. Although the bridge opened to motorists in August of 1963, the contract was not considered complete until December 3 of that year.[36]

Bridge access roads were located at 84th Avenue NE, 104th Avenue NE, and State Highway 2A, near 116th Avenue NE.[37] The west side of the bridge was accessed from the Montlake neighborhood at Lake Washington Boulevard and Montlake Boulevard. The bridge toll plazas were placed between 84th Avenue NE on the eastern lake shore, with seven toll booths to accommodate anticipated traffic.

The Official Opening

It took nearly three years (837 days) to complete construction for the bridge. On the same day (August 28, 1963) that Martin Luther King led his famous civil rights March on Washington, this

[33] WTA 196*0.*
[34] "Mud to Raise Cost of 2nd Floating Span" 1955.
[35] "Evergreen Point Bridge," n.d.
[36] "Evergreen Point Bridge," n.d.
[37] "Bridge Offices Will Be Brought to U. on Barge," *The Seattle Times*, August 13, 1954.

new bridge was dedicated in Washington State. The "Official Opening" was attended by scores of local and national dignitaries. Governor Rosellini as Chairman of the Washington State Toll Bridge Authority presided over the dedication and ribbon-cutting ceremony.[38] In addition to the ceremony at the bridge, a pre-dedication luncheon was held at the Seattle Chamber of Commerce and an evening banquet attended by dignitaries was held in Bellevue after the opening ceremonies.[39]

The prestigious speakers' list included Gordon Clinton, Mayor of Seattle; George Kachlen, Jr., President of the American Automobile Association; Scott Wallace, Representing the East Lake Washington communities; Ed Munro, Chairman of the Board of King County Commissioners; Walter McKibben, Acting Director of Highways; Ernest Cowell, Chairman of the Washington State Highway Commission; and Clarence D. Martin, son of the former Washington State governor, who served as Under Secretary of Commerce for Transportation (the agency which later merged into the cabinet-level U.S. Department of Transportation). The 13th Naval District Band played the National Anthem (WSHC and WTBA 1963). Hundreds of motorists lined the bridge in each direction, meeting in at the drawspan in the center of the bridge. In his speech, the Governor, referring to the lawsuit, derided those "indifferent or deliberate obstructionists" whose efforts contributed to the many delays in construction both before and during construction, and said, "if there had been a wooden stake placed at every location proposed by someone for this bridge we'd probably have a picket fence bordering the shoreline" of Lake Washington. Once the ribbon was cut and the speeches were given, Governor and Mrs. Rosellini led the caravan from the drawspan to the east side of the bridge in an open-top white convertible.[40]

DESCRIPTION OF THE EVERGREEN POINT BRIDGE

The Evergreen Point Bridge is a floating concrete pontoon bridge. Floating concrete pontoons are typically held in place by anchor blocks secured to the lake or channel bottoms. Pontoons and anchor blocks are connected by cables. Historically, the drawback to a floating pontoon bridge was the inability to move, and make way for waterborne traffic wishing to pass.[41] The Evergreen Point Bridge's unique design incorporated movable pontoons and a drawspan, which allows for the passage of ships and other maritime vessels.

The Evergreen Point Bridge is also significant in pontoon bridge design because at the time it was built, it was the longest floating concrete pontoon bridge span in the world. The floating section of the bridge is 7,578' (1.4 miles) long. It was constructed with four 13' traffic lanes, two in each direction, with 2' median and a 3' walkway on its south side. A control house of wood frame construction sits near mid-span, just east of the navigation channel on the bridge's south side. It remains the longest floating bridge in the world.

[38] WSHC and WTBA, 1963.
[39] Nelson, Stub, "With Stub at the Bridge," *Seattle Post-Intelligencer*, August 29, 1963.
[40] Nelson, 1963.
[41] Johnson, 2002.

At the Evergreen Point Bridge's termini, the east and west approach structures connect the floating structure to shore with elevated steel truss span structures with fixed piers. They provide sufficient vertical clearance (up to 77' at the east approach), allowing tall mast craft to pass.

The minimum height of the floating bridge's roadway above water is 7.75', where the roadway sits directly on the floating pontoons; the maximum roadway height is 59', where the road surface is elevated above the concrete pontoons at the east end of the floating structure. The top of the railing sits about four feet above the roadway surface. Approximately 11,806,000 pounds of reinforcing steel was used to construct the bridge. [42] Once constructed, the bridge in its entirety weighed 114,000 tons.

Pontoon Details

The roadway rests on 33 pre-stressed concrete pontoons. Interior cell walls are 6" thick, while the exterior pontoon walls are 9" thick.[43] However, not all of the 33 pontoons are exactly the same size. As described below, different sized pontoons were used to accommodate various design specifications, including connections to the approach structures or lift spans. 18 of the pontoons are referred to as "standard sections," measuring 360' long by 60' wide and 16' tall, weighing 4725 tons. The remaining 15 pontoons were known as "special floating sections," of varying sizes, which include four fender pontoons, which help to buffer the pontoons that hold the lift spans and other machinery from high winds and collisions.[44] Each pontoon—with the exception of the four fender pontoons – is assigned a letter or combination of letters, "A" on the westernmost side and "AA" on the easternmost side.[45]

Near the Evergreen Point Bridge's midpoint are two steel lift drawspans that flank two 164' long movable pontoons. The drawspans were designed to be raised 7', 2", which allows the movable pontoons to retract. Once opened, the span has a 200' wide opening to allow passage of ships. The drawspans retract into hourglass-shaped sections on both sides. The lift spans were originally powered by eight five-horsepower motors, which were chained to counterweighted pipe columns. Twenty 8" diameter pipes are required to lift each span, and were housed in the adjacent pontoons, LL and OO. However, because of difficulties with maintenance, engineer Gil Lund, of Hamilton Engineering, designed a replacement system of hydraulic cylinders to lift the spans, which is still in use today.[46]

The most common method for attaching floating pontoons to a lake bed – and the method used in the Evergreen Point Bridge and all floating bridges in Washington State –is a system of mooring lines and anchors. The bridge pontoons are held in place by 62 anchors, attached with 2-3/16" diameter cables. At the east and west approaches, anchors require 2-3/4" diameter connecting cables. Different types of anchors are attached to the cables, and are selected based on water

[42] "Evergreen Point Bridge," n.d.
[43] "Evergreen Point Bridge," n.d.
[44] Maudlin, Douglas B, "Washington's Wonderous Highways that Float," *Highway News,* September-October 1963.
[45] Washington Toll Bridge Authority, As-built drawings 1959, WSDOT Bridge and Structures Office, Tumwater.
[46] HistoryLInk.org Online Encyclopedia of Washington State History, "Evergreen Point Floating Bridge opens on August 28, 1963 (Essay 690) by Greg Lange, 1999.

depth and soil conditions. Type A standard jet type anchors, each weighing 77 tons, are used in the deep water where the soil is very soft. According to the *Bridge Engineering Handbook*:

> [Type A anchors] are constructed of reinforced concrete fitted with pipes for water jetting. They are lowered to the bottom of the lake and the water jets are turned on allowing the anchors to sink into the soft lake bottom to embed the anchors fully. Anchor capacity is developed through passive soil pressure.[47]

Type B anchors are used in water depth less than 88' deep, where the soil in Lake Washington is hard. These anchors consist of two steel construction H-piles that are tied togetherand are driven into place. Type C anchors are constructed of reinforced concrete. These anchors are box-shaped "gravity-type" anchors, whose "top" remains open as the anchor is lowered into place. Once in its correct location, the box is filled with gravel to keep it in place on the lake bottom. This anchor type is most appropriate in deep water, where the soil is too hard to allow jetting.

A brief description of each Evergreen Point Bridge pontoon, moving from west to east, is provided here.

Pontoon A: This is the western terminus of the floating structure. At 60' wide, 110' long, it serves as the foundation pontoon for the west transition span, attaching to the west approach structure. It is secured to the lake bed with a Type B anchor on the north side and a Type C anchor on the south side.

Pontoons B, C, and D: These three pontoons, each measuring 360' wide and 60' long, support the elevated superstructure. At its highest point, the railing is 61.82 feet above water, descending from there at a five percent grade. The roadway is elevated by five-column concrete bents with mid-column struts. Pontoon B is secured with a Type B anchor on the north side and a Type C anchor on the south side. Pontoons C and D are secured with Type A anchors.

Pontoon E: This transition pontoon, at the bottom of the descending grade, is 288' wide and 60' long. It is the last of the western pontoons to support a slightly elevated roadway. This pontoon is secured with Type A anchors.

Pontoons F, G, H, I, and J: These standard floating pontoons are each 360' wide and 60' long, and support the roadway at lake level. They are secured with Type A anchors.

Pontoon K: This is a small, trapezoid-shaped pontoon that connects the standard pontoons with the western "lift pontoon", which helps to move the center drawspan. It is only 75' wide and flares out on the eastern side. It is secured with Type A anchors.

Pontoon L: This 105' wide and 60' long pontoon supports the steel lift span on the west side of the movable pontoons. It is flanked to the north and south by smaller pontoons (including

[47] Chen, Wai-Fah and Lian Duan. *Bridge Engineering Handbook.* CRC Press LLC, 1999:22-5.

Pontoon LL) that support, among other things, the machinery room and the Operator's house. This pontoon is secured with Type A anchors.

Pontoons M and N: These pontoons are 164' wide and 60' long movable pontoons that retract when the lift spans are activated. When opened, they provide a 200' horizontal clearance for boats. They are secured with Type A anchors.

Pontoon O: This 105' wide and 60' long pontoon supports the steel lift span on the east end of the movable pontoons. Like Pontoon L, it is flanked to the north and south by smaller pontoons (including **Pontoon OO**), and is secured with Type A anchors.

Pontoon P: Similar to Pontoon K, this is the small, trapezoid-shaped pontoon that connects the standard pontoons with the lift pontoon. It is 75' wide and flares out on the western side. It is secured with Type A anchors.

Pontoons Q, R, S, T, U, and V: These standard floating pontoons, each 360' wide and 60' long, support the roadway at lake level. They are secured with Type A anchors.

Pontoon W: This transition pontoon is 288' wide and 60' long, and begins the gradual ascension to a slightly elevated roadway. It is secured with Type A anchors.

Pontoons X, Y, and Z: These three pontoons, each 360' wide and 60' long, support the elevated superstructure at the east end of the bridge. At its highest point, the railing is 61.82' above water, and ascends at a five percent grade. The roadway on these pontoons is elevated by five-column concrete bents with mid-column struts. Pontoons X and Y are secured with Type A anchors on the north and south sides. Pontoon Z is secured with a Type C anchor on the north side and a Type B anchor on the south side.

Pontoon AA: This is the eastern terminus of the floating structure. At 60' wide, 110' long, it serves as the foundation pontoon for the transition span, and attaches to the east approach structure. It is secured with a Type A anchor on the north side and a Type C anchor on the south side.

Communities Adjacent to the Evergreen Point Bridge

Today, the surrounding communities reflect the area's progress and diverse population. An important aspect of Seattle area history is captured in the development, evolution, and challenges faced by the neighborhoods surrounding the Evergreen Point Bridge. Completion of the bridge was a final step in a long procession of transportation projects that affected many communities along the northern reaches of Lake Washington and within the SR520 corridor. Impacts to neighborhoods and towns have varied depending upon their location. The areas closer to the bridge and highway right-of-way experienced a new barrier in their communities. In contrast, for other areas located further away from the route, the Evergreen Point Bridge served as a direct and convenient link across the lake. The following paragraphs provide a brief overview of some

of the neighborhoods and communities closest to the Evergreen Point Bridge, all of which were affected directly or indirectly by construction of the floating bridge. The neighborhoods include Montlake and Madison Park in Seattle, on the west side of Lake Washington, and Medina, located on the east side of Lake Washington. Also included in the description below is the Washington Park Arboretum in Seattle which, although not a community, is a significant natural and cultural resource that was directly affected by construction of the SR 520 mainline.

Montlake (located in Seattle)

The Montlake community extends from the Washington Park Arboretum on its east, to Portage Bay on its west, to the Montlake Cut at the north, and Interlaken Park and Interlaken Boulevard at the south. In 1909, the same year that Montlake was platted, the Alaska-Yukon-Pacific Exposition, located just to the north at present day University of Washington, brought marked transportation improvements to the area. Trolley car lines and a new road from Seattle along Interlaken Boulevard to Lake Washington made Montlake a convenient suburb of Seattle. Several years after the exposition, the Montlake Cut, which connects Lake Washington with Lake Union was established, resulting in the north end of the neighborhood becoming waterfront property.[48] As the neighborhood lots were gradually filled in through the years, homes in Montlake developed into an eclectic, varied group. The neighborhood was significantly changed when construction of SR 520 was completed in 1963. The route's mainline severed the community on an east/west axis, creating additional noise and a physical barrier between the northern and southern residents.

The Washington Park Arboretum (located in Seattle)

The mainland area currently occupied by the Washington Park Arboretum was purchased in 1864 by Jackson Pope and Frederic Talbot who later organized their vast timber interests in the Pacific Northwest as the Puget Mill Company, a subsidiary of the San Francisco–based Pope & Talbot Company.[49,50] After logging the area, the Puget Mill Company deeded 62 acres to the City of Seattle. In return the City constructed a $35,000 water main to some of the Puget Mill Company's land.[51] The 62 acres of property became the early beginnings of "Washington Park", one of Seattle's first parks. More acreage was added in following years and, by 1916, the city had incorporated a total of 165 city-owned acres. [52] The city's last acquisitions of land for park took place with the 1917 purchase of Foster Island from the McGilvra Estate, and purchase of several irregular-shaped lots comprising the southwest corner of the park in 1920 and 1921.[53]

The Olmsted brothers, popular and revolutionary landscape designers, designed the Seattle's park system in 1903.[54] The Seattle system remains one of the most fully-constructed and well-preserved Olmsted park and boulevard systems in the United States.[55,56]

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[48] Sherwood, D. *Montlake Playfield and Community Center*, 1974.
[49] Bagley, C.B. *History of Seattle from the Earliest Settlement to the Present Time: Volume 1,* The S.J. Clarke Publishing Company, Chicago, 1916, 278.
[50] Thomas, Jane Powell, *Madison Park Remembered,* Seattle, 2004.
[51] Thomas, 2004.
[52] Bagley, 1916, 278.
[53] Easton, V. "The Naming of Foster Island," *1989, Washington Park Arboretum Bulletin 52(1):*24 *1989.*
[54] Bagley, 1916, 272-3 .

Foster and Marsh Islands are peat and marsh landscapes that lie near the southern shore of Union Bay. They are considered part of the Washington Park Arboretum, located at the park's northern end. Foster Island grew considerably when the Ship Canal and the Hiram M. Chittenden Locks (also known as the Ballard Locks) were opened and lowered the water level of Lake Washington by nine feet. Marsh Island is located west of Foster Island and is considerably smaller.

In 1934, the Seattle Parks Board answered a plea by the University of Washington (UW) to build a botanical garden, by signing an agreement to let UW build an arboretum within Washington Park. The Olmsted Brothers drafted the plan for the new Arboretum, a "veritable jewel" of Seattle, in March 1936.[57] Between 1937 and 1942, Works Progress Administration (WPA) laborers completed much of the basic infrastructure, still present today, that was outlined in this 1936 plan.[58,59] The UW continues to manage the plant collections.

In 1963, the Washington Park Arboretum lost approximately 54 acres of lagoon from SR 520 construction.[60,61] The SR 520 mainline also dredged through Foster Island to create the isthmus over which the highway passes. These physical intrusions brought increased noise and traffic through the Arboretum, resurrecting the concerns of the Arboretum Foundation and other activists from the years prior to bridge construction.

Madison Park (located in Seattle)

Located to the east of the Washington Park Arboretum is Madison Park; which is bordered by Lake Washington to the east and Union Bay to the north. Judge John J. and Elizabeth McGilvra purchased 420 acres of land on the western shore of Lake Washington in 1864, and eventually began developing their property as a lakefront resort and entertainment center. To make it easier to reach the development, McGilvra negotiated an extension of the Madison Street Cable Railway from Capitol Hill to the waterfront. In exchange, McGilvra gave the company 21 acres of lakefront property and $50,000 to develop the area into picnic grounds.[62] McGilvra named his road from the city, as well as the waterfront park, in honor of the fourth president, James Madison.[63] By 1889, McGilvra began leasing small plots of his land and only allowed small summer cottages or tent houses to be built on them. It was not long before other Lake Washington residents wanted better access to Madison Park. In 1900, public ferry service was

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[55] BOLA Architecture & Planning and Karen Liest Landscape Architects, *Washington Park Arboretum Historic Review,* September, 2003.
[56] Takami, D. and N. Keith, "Another Scenic Century: Seattle Looks Back at Olmsted from the Centennial Horizon," *Landscape Northwest,* April 10, 2003.
[57] Boren, V. "Arboretum Friends Call Rally for Tomorrow," *Seattle Times,* June 3, 1936,21-22.
[58] Institute of Forest Products, University of Washington and College of Forest Resources, *University of Washington Arboretum: A Nature Showcase for All Seasons,* Friends of the Arboretum, 1969.
[59] Information on University of Washington Arboretum, (On file at Seattle Public Library) N.d.
[60] Institute of Forest Products et al. 1969.
[61] University of Washington, *Report of the University Committee on the Arboretum, (*On file at Seattle Public Library) June 1963.
[62] Thomas, 2004.
[63] Sherwood, D. *Madison Park,* 1974.

established between Kirkland and Madison Park with double-ended boats spacious enough for wagons and horses.[64]

The construction of the Lacey V. Murrow Bridge in 1940 caused a decrease in ferry traffic and within ten years, the Madison Park-Kirkland Ferry ceased operations. As a result, the number of Madison Park visitors began to decrease and the area developed into a quiet waterfront community with a small shopping district.[65] Construction of the Evergreen Point Bridge introduced a new visual intrusion to the north and east, as well as some increased noise, which affected the quiet small-town setting. However, unlike the communities of Montlake (described above) and Medina (described below), the impacts were indirect, as opposed to physical intrusions within the communities.

Medina (Eastside)

Many communities dot the eastern shores of Lake Washington, including Medina, Hunts Point, Clyde Hill, and Yarrow Point. Thick, tall trees first drew lumbermen to the area and in short order began the work to fell these great forests.[66] Once the land along the shoreline was cleared of timber, berry farms and orchards were developed in the new open spaces.[67] Drawn by the rural charm and excellent views, Seattle businessman Thomas Dabney became Medina's first permanent settler in 1886. In 1891, Dabney built a dock at Dabney's Landing, located near present-day Medina City Hall, attracting other residents to the area. The following year, the new community named its town Medina Heights.[68,]

Many successful and wealthy Seattle businessmen and entrepreneurs gravitated to eastern shore of Lake Washington to construct expensive mansions and estates. During the early 1900s, lakeshore estates continued to emerge in Medina Heights. This trend began in 1905 when Edward Webster, the secretary and general manager of Seattle's Independent Telephone Company, erected a home called "The Gables." Several similar houses followed and on February 18, 1914, Medina Heights was officially platted with large waterfront tracts. In the following years, the area was promoted as an exclusive residential area, located away from the bustle of city life but close enough to enable the trip to be made quickly.[69] A 1913 newspaper advertisement claimed that Leschi Park, located on the west side of Lake Washington, could be reached by ferry from Medina within ten minutes, and the Smith Tower, a symbol for Seattle commercialism, could be reached within 25 minutes.[70]

In 1919, Medina's first marketing campaign characterized the area as "the heart of the charmed land."[71] Large, impressive houses built by Seattle's elite lined the shores of Lake Washington.

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[64] Thomas, 2004.
[65] Thomas, 2004.
[66] McDonald, L. "Pioneer Times in the Point Country," *Seattle Times,* August 15, 1955, 84.
[67] McDonald, L. "Medina is Preparing to Light Ten," *Seattle Times,* August 15, 1965, 142-43.
[68] Cornwall, W. "The Gold Coast," *A Hidden Past: An Exploration of Eastside History*, *Seattle Times*, 2002.
[69] McDonald 1965; Rochester 1993.
[70] Cornwall 2002.
[71] Rochester, 1993.

Despite their elegance, many residences were intended as summer homes and were only occupied for part of the year. When a golf club was organized and yachts were moored in front of the large estates, the area's abundant and lavish wealth earned it the nickname the Gold Coast.[72]

In 1940, the Lacey V. Murrow Bridge was completed to the south, between Bellevue and Seattle, opening the east side of Lake Washington to greater development.[73] Although much of this new development took place in Bellevue to the southeast, Medina Heights grew concerned that its large-lot residences, lack of commercial areas, and personalized public services would be threatened. As a result, on July 26, 1955, Medina Heights formally changed its name to Medina. The city implemented strict zoning regulations and was zoned completely residential with businesses only able to operate in existing stores with the exterior shell maintained as it was originally built.[74] Today, Medina is predominantly residential and characterized by large single-family homes. State Route 520 separates the north and south portions of the town, which altered the community's physical setting as well as its small-town feel. Further, construction of the Evergreen Point Bridge contributed to the dramatic increase of the residential population in Eastside suburbs, as well as the emergence of local, national, and multinational businesses, such as Microsoft and Eddie Bauer, located on the east of Lake Washington.

GROWTH AND CHANGE

The Evergreen Point Bridge immediately eased congestion on the Lacey V. Murrow Bridge. The toll to cross the bridge was 35 cents. The Washington State Toll Bridge Authority paid for the bridge with a 30-million-dollar, 40-year bond, which they expected to be paid off in the year 2000, but traffic was so heavy it was paid off in June 1979, sixteen years after the bridge was constructed and more than twenty years ahead of schedule.[75]

The opening of the Evergreen Point Bridge eased traffic on the Lacey V. Murrow Bridge, and also stimulated development in the communities on the Eastside. The areas grew substantially in the decades following construction of the bridge; eventually increasing traffic and resulting in a more difficult commute across Lake Washington. Between 1960 and 1970, Bellevue's population increased by 377%, growing from 12,809 to 61,102 people. Between the same years, Kirkland's population grew by 78.5%, from 8,551 to 15,249 people; and by 1990, the population had reached 40,052.[76]

In 1988, the name of the bridge was officially changed to the Governor Albert D. Rosellini Bridge – Evergreen Point, to acknowledge Rosellini's role as advocate for construction of the bridge, though locals often refer to it as the "520 Bridge" or "Evergreen Point Bridge."

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[72] Corsaletti, L.T. "Meydenbauer Bay" *Seattle Times,* June 9, 1982, 86.
[73] Cornwall 2002.
[74] Woodward, W, "Bellevue's Balky 'Balkans,'" *Seattle Times*, May 2, 1971, 168-9.
[75] Holstine and Hobbs 2005, 176.
[76] Moffat, Riley Moore, *Population History of Western U.S. Cities and Towns, 1950-1990,* Scarecrow Press, 1996.

The increase in population led to the construction of a third floating bridge on Lake Washington – the Homer M. Hadley Memorial Bridge, built in 1989 directly parallel and adjacent to the Lacey V. Murrow Bridge, along what was then part of Interstate 90 (I-90). After the Homer M. Hadley Memorial Bridge was constructed, the state temporarily closed the Lacey V. Murrow Bridge in order to renovate the pontoons. In the fall of 1990, while undergoing renovation, the Lacey V. Murrow Bridge suffered a catastrophic failure and collapsed. The watertight doors of the bridge pontoons were removed so that the pontoons could be used to temporarily contain the contaminated water from a hydrodemolition project on the bridge. During the hydrodemolition project, a severe storm inundated the bridge pontoons with rain and lake water. As the pontoons began to fill, one pontoon sank and dragged along the rest of the pontoons that were adjoined with cables.[77] In 1993, new pontoons were constructed and the rebuilt bridge began carrying traffic again. The replacement structure retained the most distinctive architectural feature of the original bridge, the original tied arch spans, as well as some of the original bridge's structural elements, including the anchor piers. The bridge opened to traffic on December 12, 1993.[78]

ALTERATIONS OVER TIME

Since its construction, the Evergreen Point Bridge has seen very few changes that have affected its physical characteristics or its setting. The alterations to the bridge over the years have mostly consisted of basic maintenance, such as painting, cable replacement, repair and replacement of expansion joints, replacement and rehabilitation of guide rollers, repair of columns, and miscellaneous electrical and mechanical rehabilitations. Crews have repaired more than 30,000 linear feet of cracks since a 1993 storm event known as the "Inaugural Day Storm."

The Evergreen Point Bridge was originally designed to withstand a 100-year storm; however, the assumptions used actually reflect a 20-year storm for the Seattle area. Longitudinal post-tensioning has been added since the 1993 storm to improve the floating bridge resistance to wind and wave action generated by winter storms.

Out of safety concerns for the travelling public, the bridge is closed during high wind events. Because of patching and other alterations to the structure, the pontoons currently float about one foot lower than originally designed, increasing the likelihood of waves breaking onto the bridge deck. Although a seismic retrofit of the approach spans was completed in 1999, the floating bridge are still at risk of collapse in an earthquake. The columns of the west and east approaches to the Evergreen Point Bridge are hollow and do not meet current seismic design standards.

The Nellie Cornish Memorial Fountains, which flanked the western end of the bridge, were a distinctive attribute to users and viewers of the Evergreen Point Bridge. The fountains were installed during the World's Fair of 1962, and were designed by sculptor Parks Anderson in

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[77] Dusenberry, Donald O., "Failure of Lacey V. Murrow floating bridge, Seattle, Washington," *Journal of Performance of Constructed Facilities,* v. 9, n.1. February 1995.

[78] Gloyd, Stewart, *ASCE History and Heritage International Landmark Nomination for: Lacey V. Murrow Memorial Bridge and Mount Baker Ridge Tunnels,* American Society of Civil Engineers, Seattle Chapter History and Heritage Committee, August 23, 2007.

memory of Nellie Cornish, of the Cornish Institute legacy.[79] Water to the fountains was shut off in 1964 because they were perpetually clogged with milfoil and other aquatic weeds. The fountains were reopened briefly in 1990, but were ultimately dismantled and replaced in 2003 by the current sculpture in that location, *Aurora Borealis*.

Other repairs to increase safety along the Evergreen Point Bridge include work such as:

1993 – Crews repaired pontoon cracks as a result of the Inaugural Day Storm.

1997 – Crews repaired pontoon bolts and seal cracks.

1999 – Crews seismically retrofitted the bridge, including the longitudinal cable post tensioning and installation of wave deflectors and additional high-strength cables. Although an improvement, the retrofit does not conform to current seismic standards or current wind/wave design load criteria.

2000 – Crews performed emergency repairs to damage on the bridge column due to impact from a floating barge, including the addition of steel bracing and other reinforcement.

2006 – Crews replaced drawspan anchor bolts sheared off during storms earlier in the year. The anchor bolts hold the drawspan closed.

More substantial work was done to increase the safety of the bridge, including the replacement of the drawspan, added watertight hatches, a water detecting system throughout the bridge, the addition of an emergency stop bar in 1994, the addition of ladders and catwalks to selected pontoons, and the installation of a median barrier. The sidewalks were converted into narrow shoulders, resulting in a 2' outside shoulders and 1' inside shoulders.

In 2011, WSDOT reinstated tolling with the installation of automated tolling equipment to help finance construction of the replacement bridge. Other alterations already mentioned include:

- Removal of the tolling facilities;
- Replacement of the lift span power system;
- General reinforcement and repair of the pontoons, roadway, and railings;
- Repair and replacement of underwater cables and anchors; and
- Removal of the Nellie Cornish memorial fountains, adjacent to the bridge.

CONCLUSION

The Governor Albert D. Rosellini Bridge – Evergreen Point is the longest floating bridge (1.4 miles) in the world. At the time of its construction, it was also the most expensive. It has been altered very little, and is significant for its use of precast concrete pontoons and for its unique system of two steel lift drawspans flanking movable pontoons, which allow for boats to pass through a 200' navigation channel. It was also the most expensive floating bridge in the world at

[79] "Cornish Memorial Fountains to Restart," *Seattle Times.* April 9, 1990.

the time it was built (Holstine and Hobbs 2005). The SR 520 Evergreen Point Bridge is a critical link connecting the major population and employment centers on either side of Lake Washington.

The floating span of the Evergreen Point Bridge, opened in 1963, provides east-west access for commuters, freight, transit, and general-purpose traffic. The aging floating bridge is vulnerable to failure in a severe windstorm, and the fixed bridges along the corridor do not meet current seismic standards and could collapse in an earthquake.

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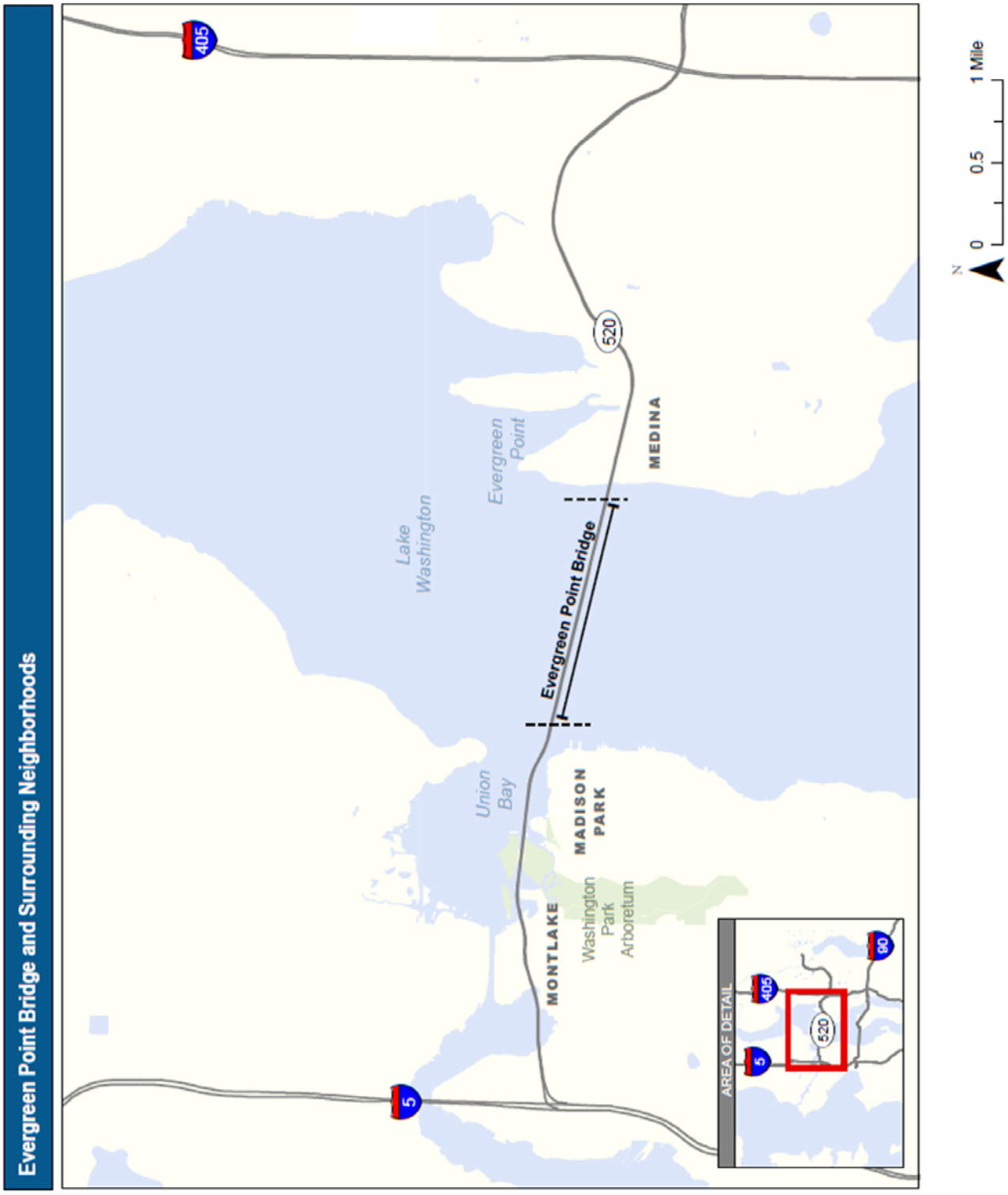
Evergreen Point Bridge and Surrounding Neighborhoods
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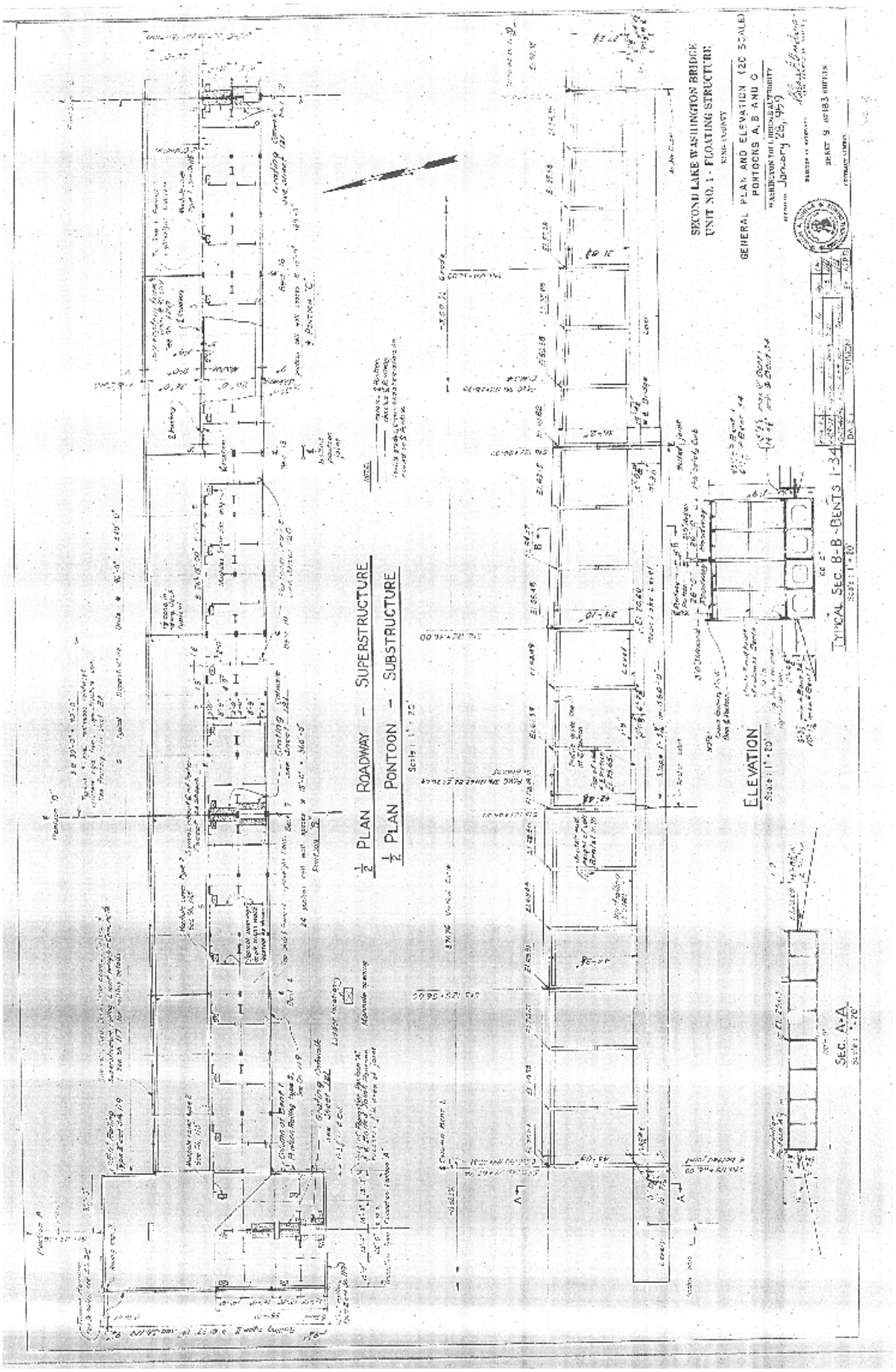

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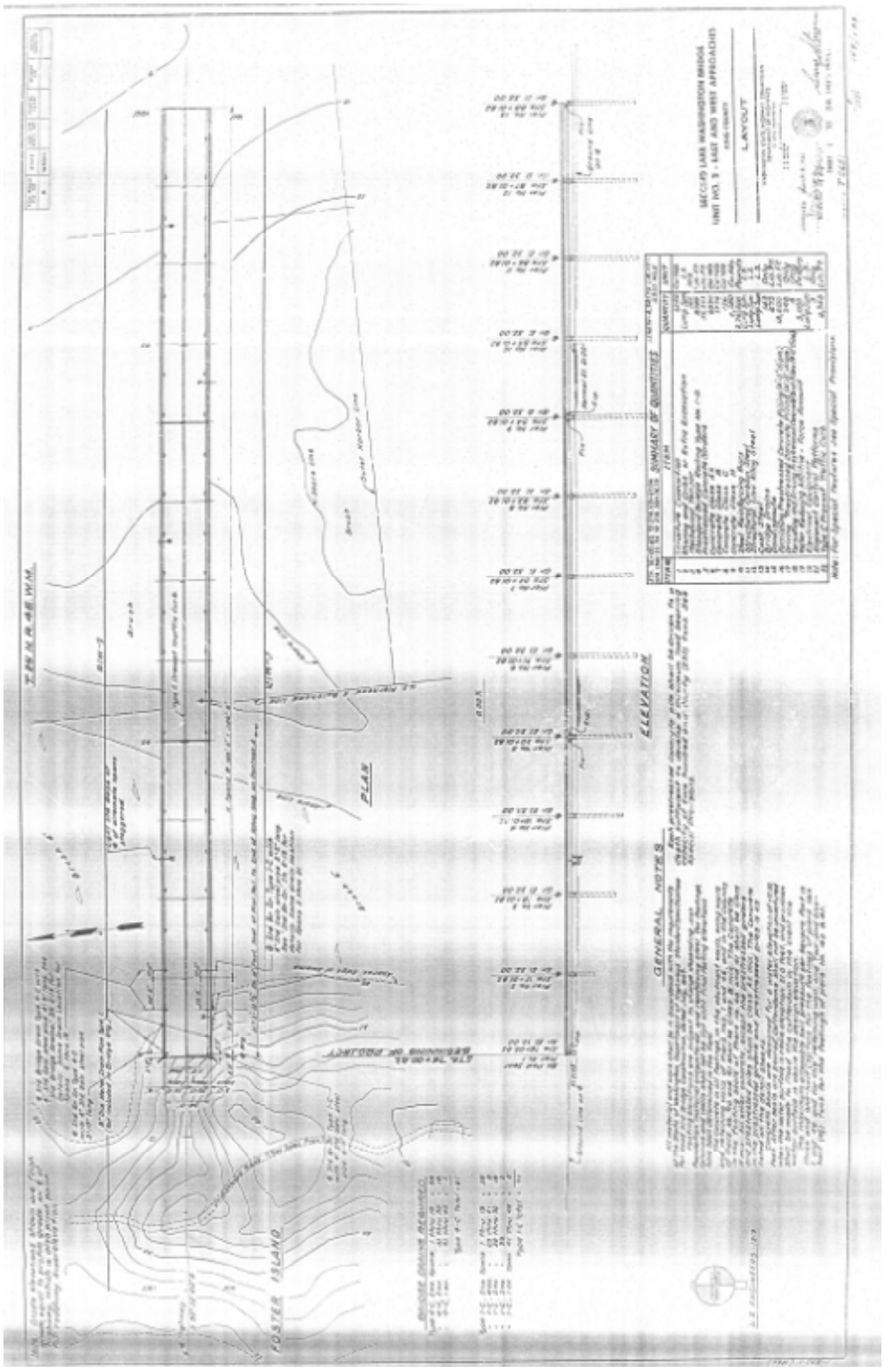

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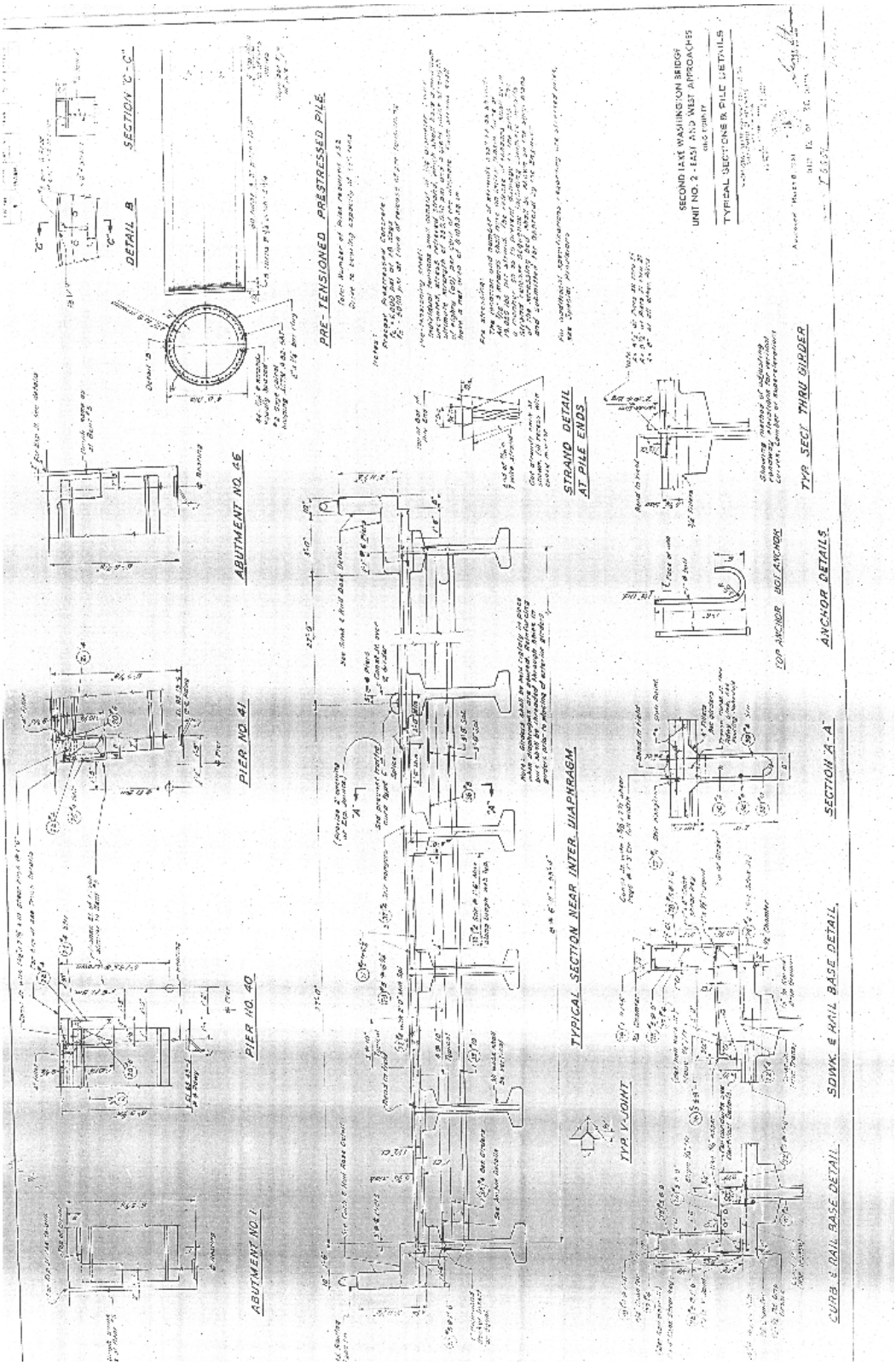

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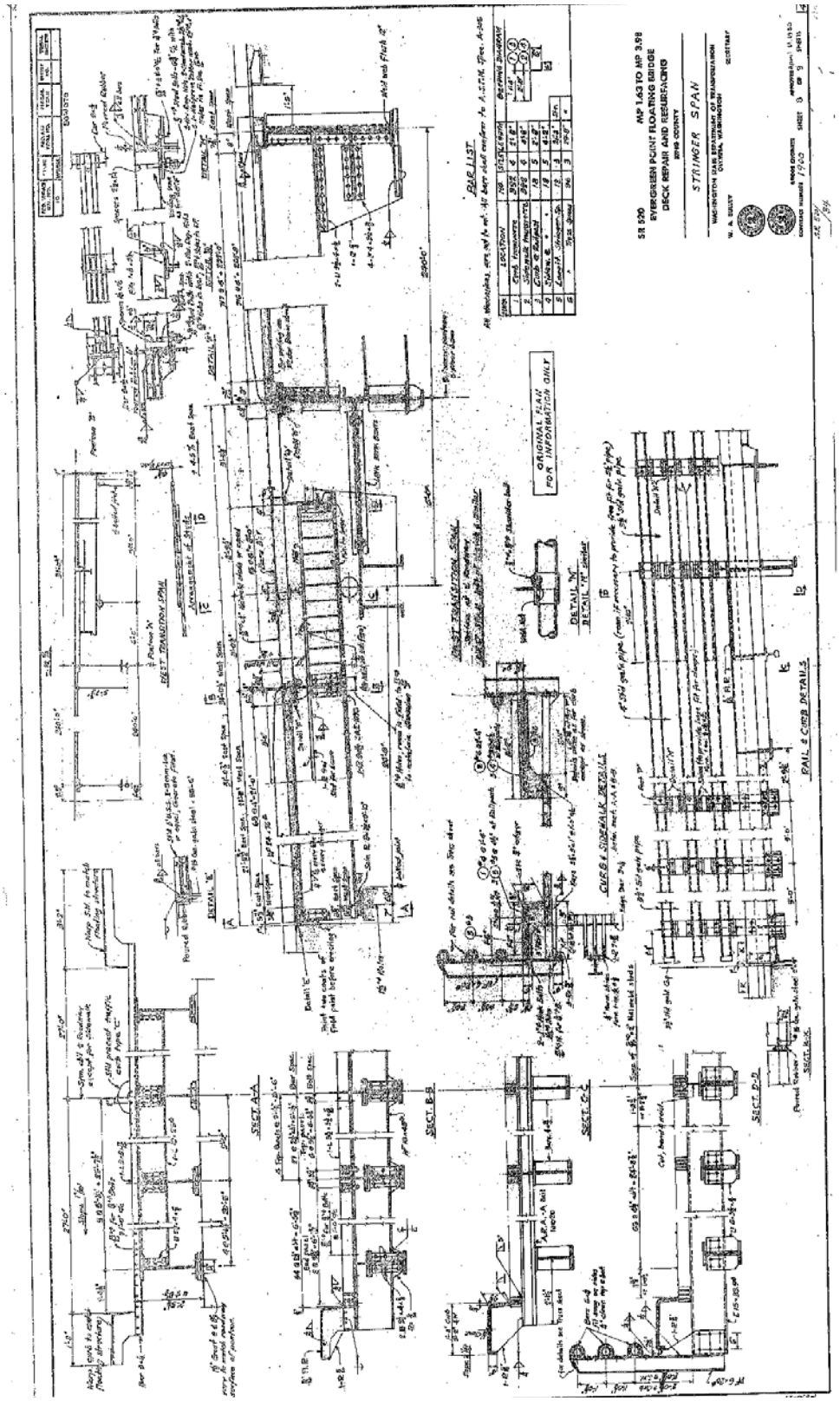

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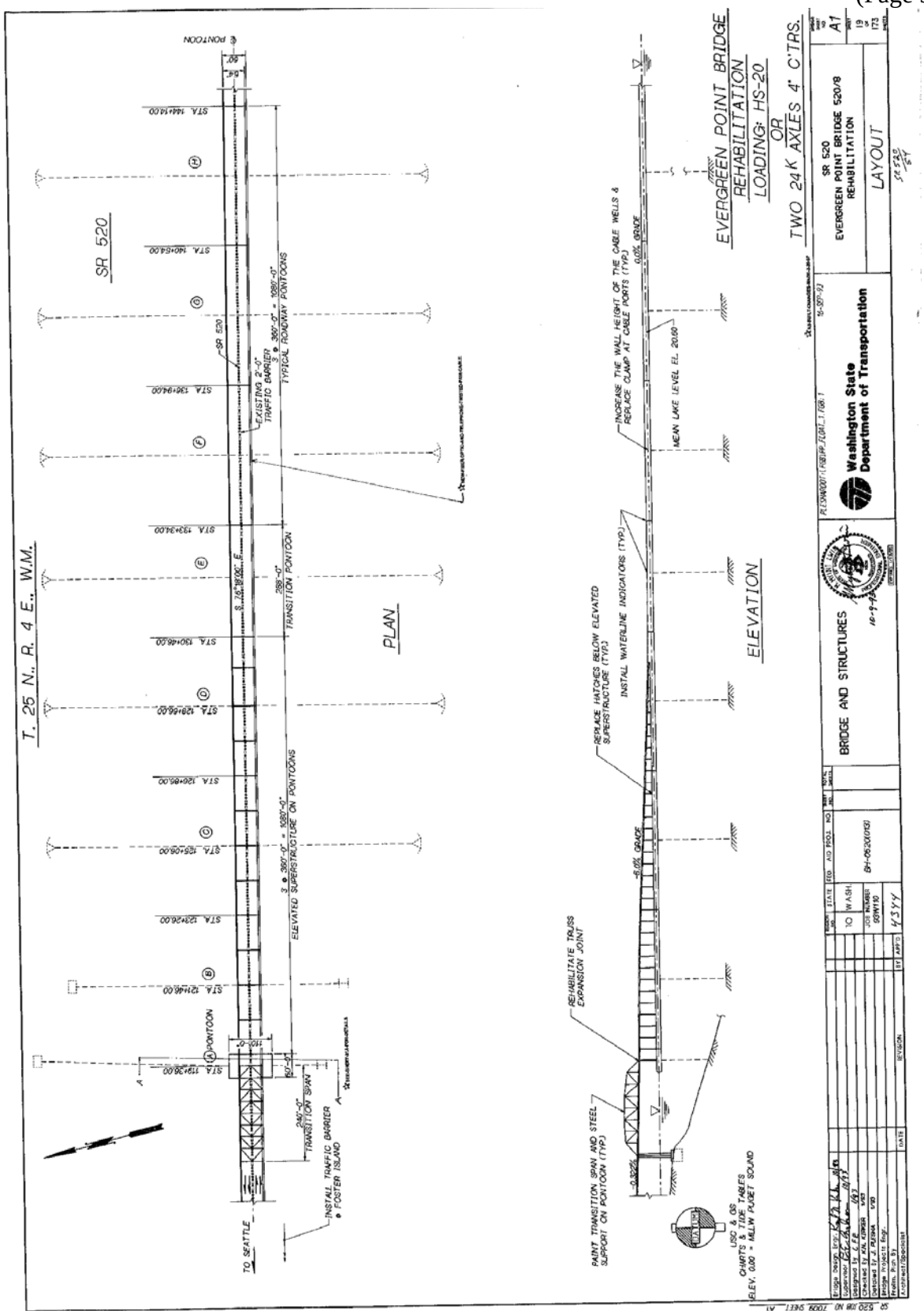

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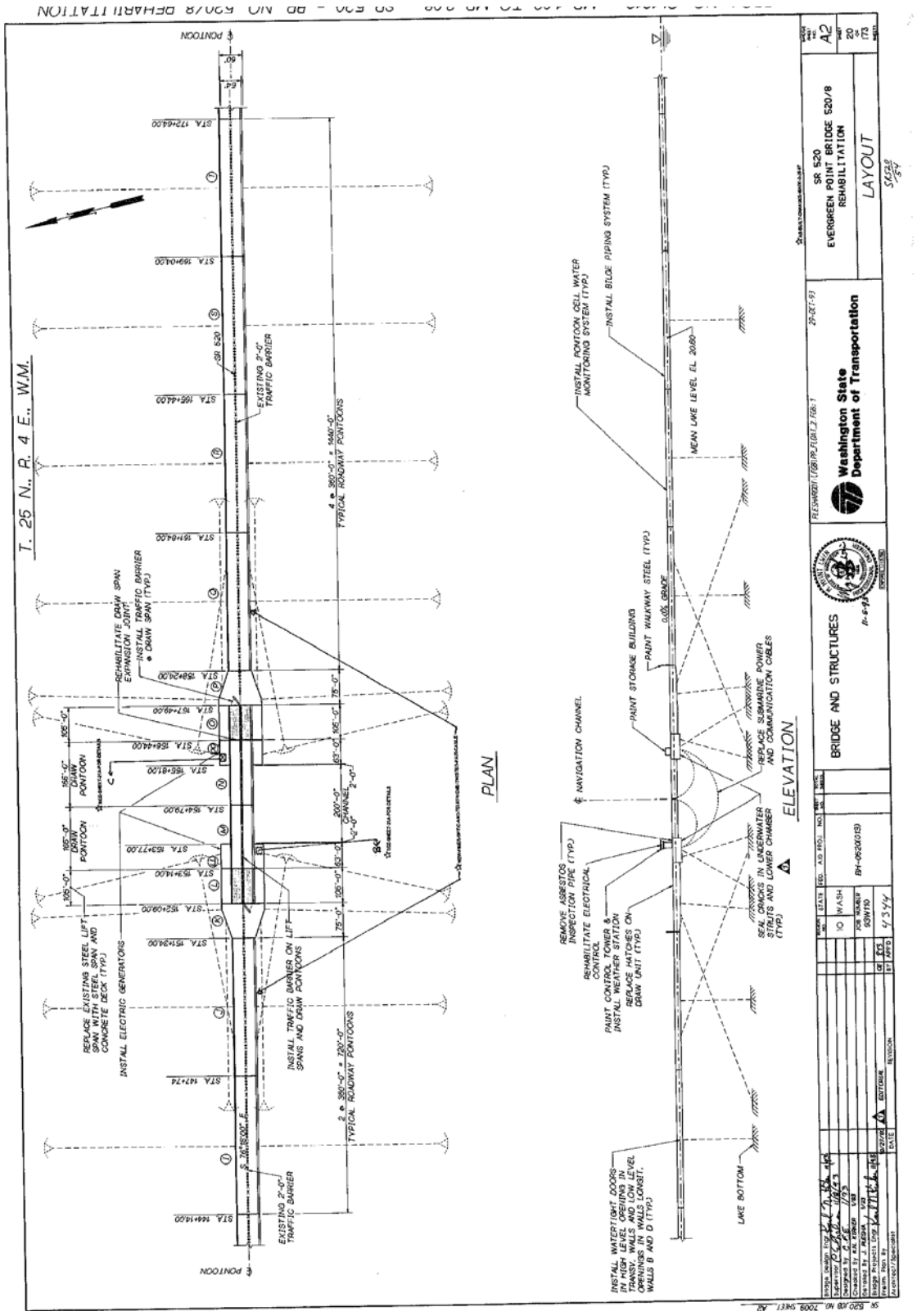

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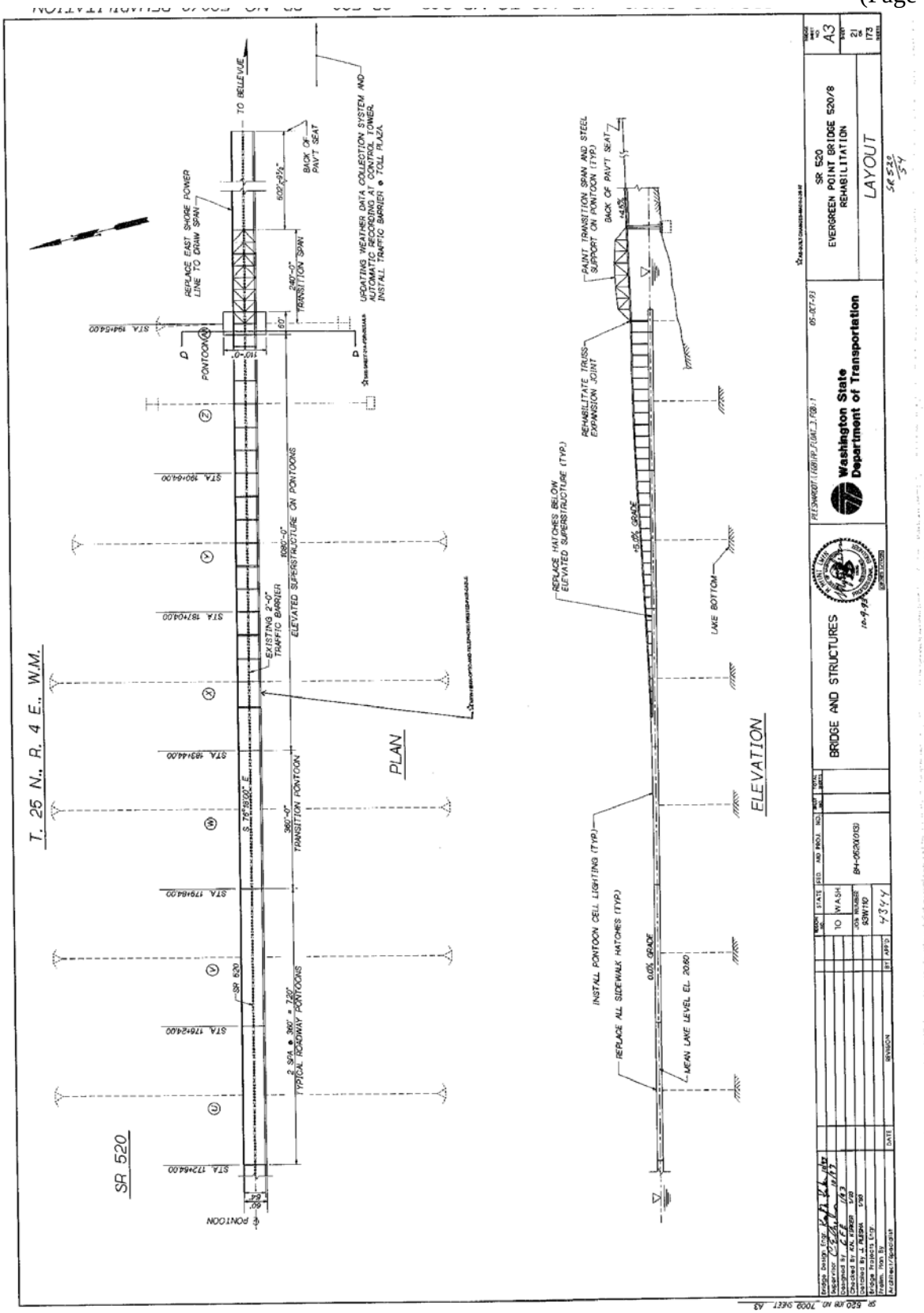

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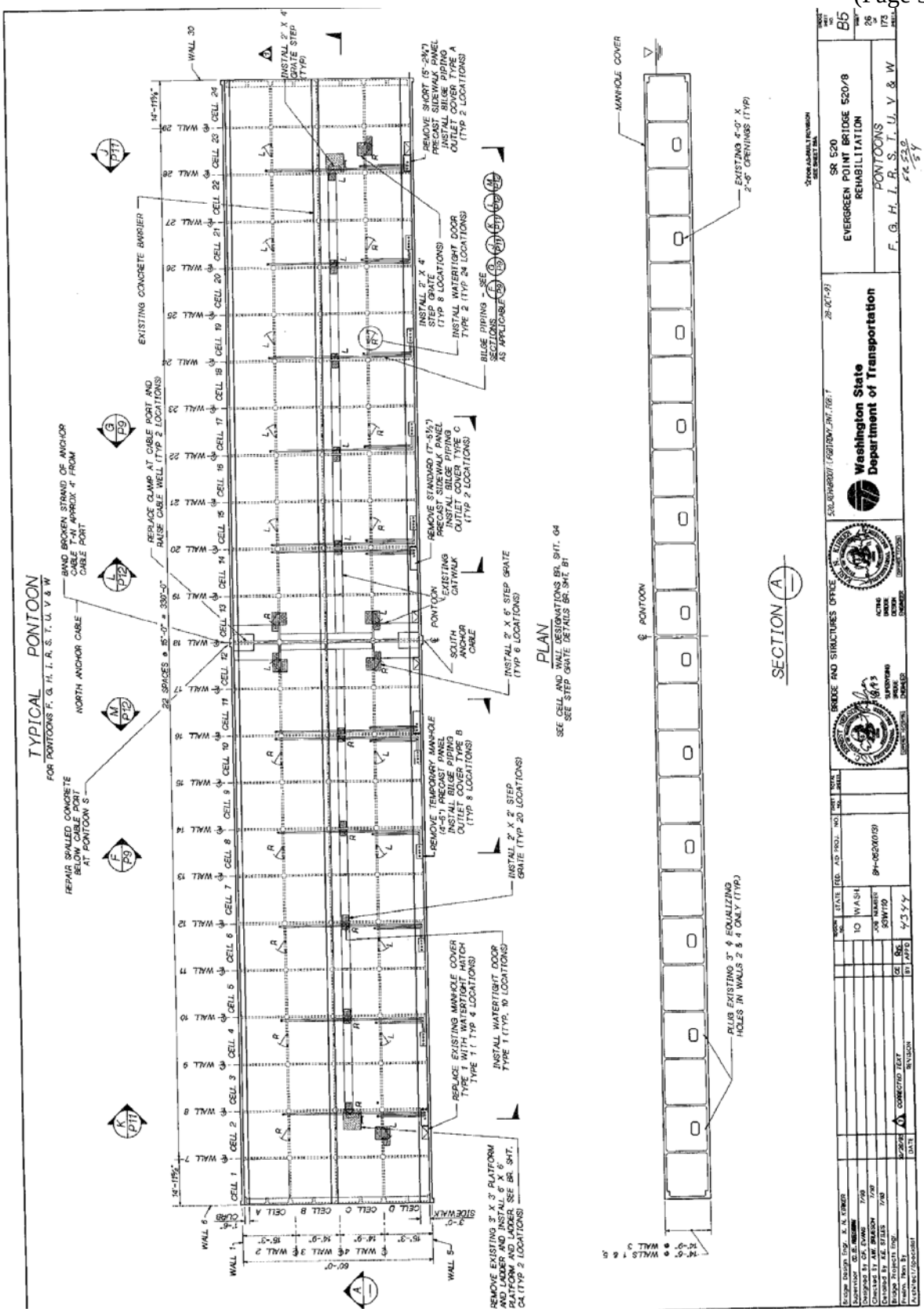

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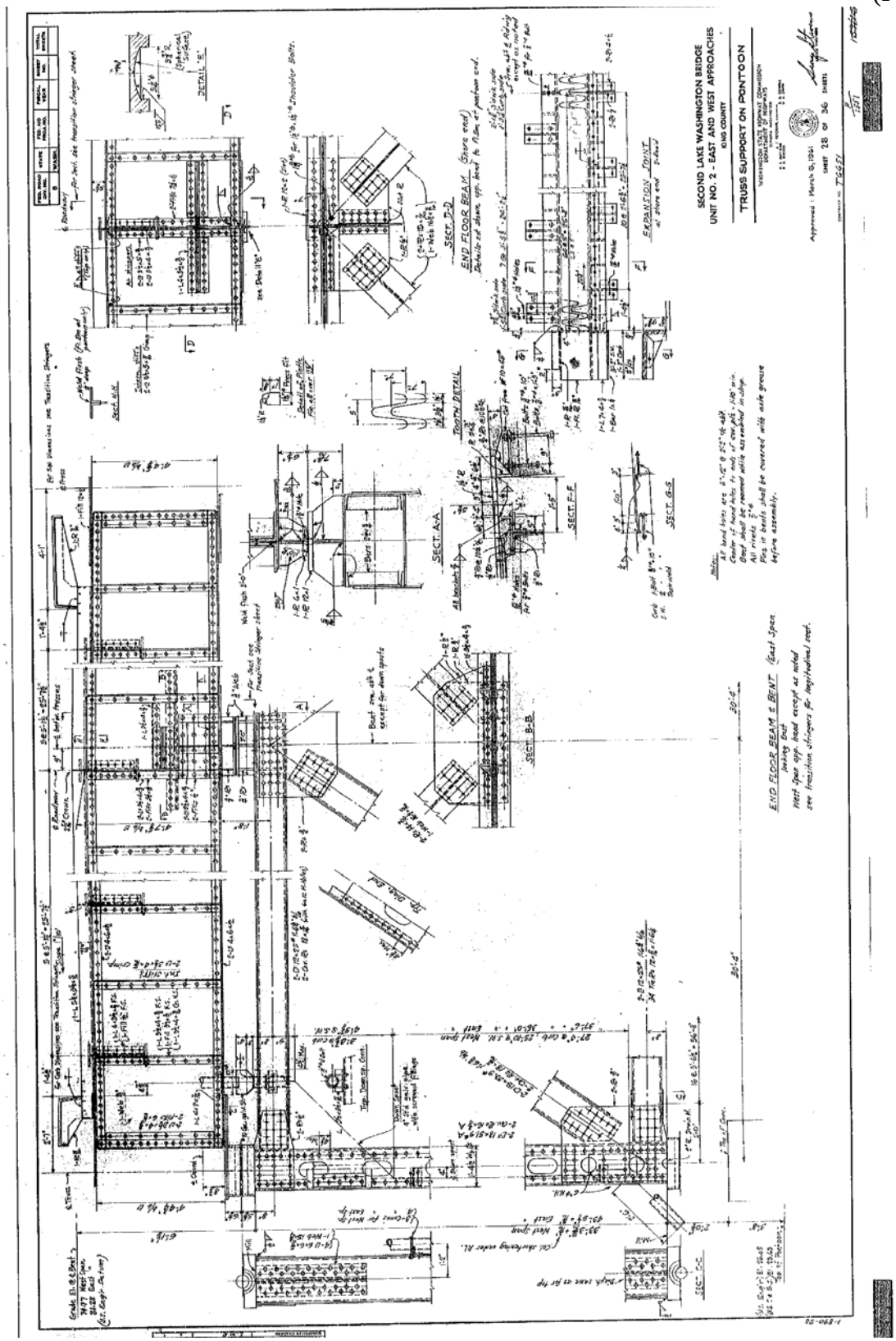

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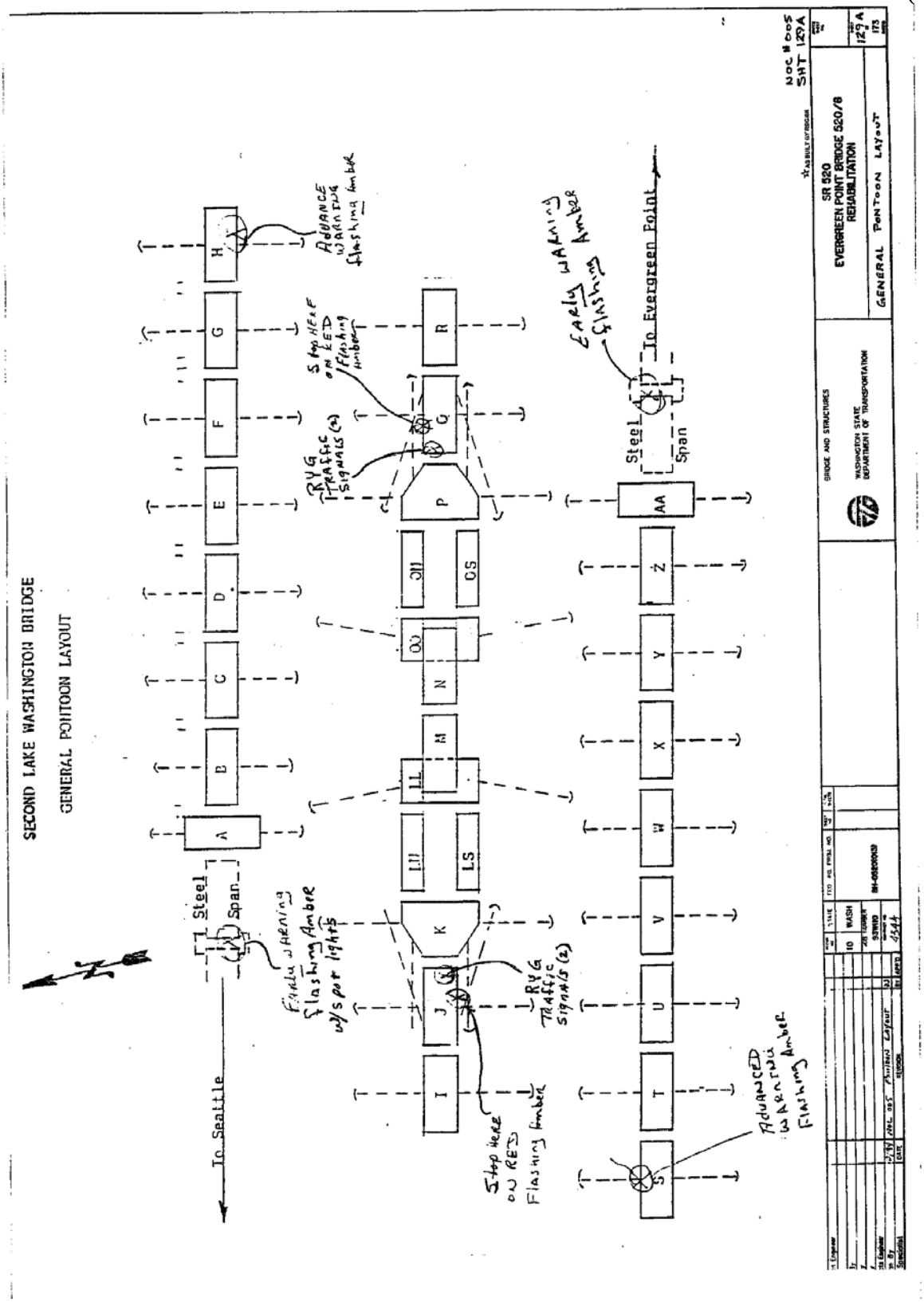

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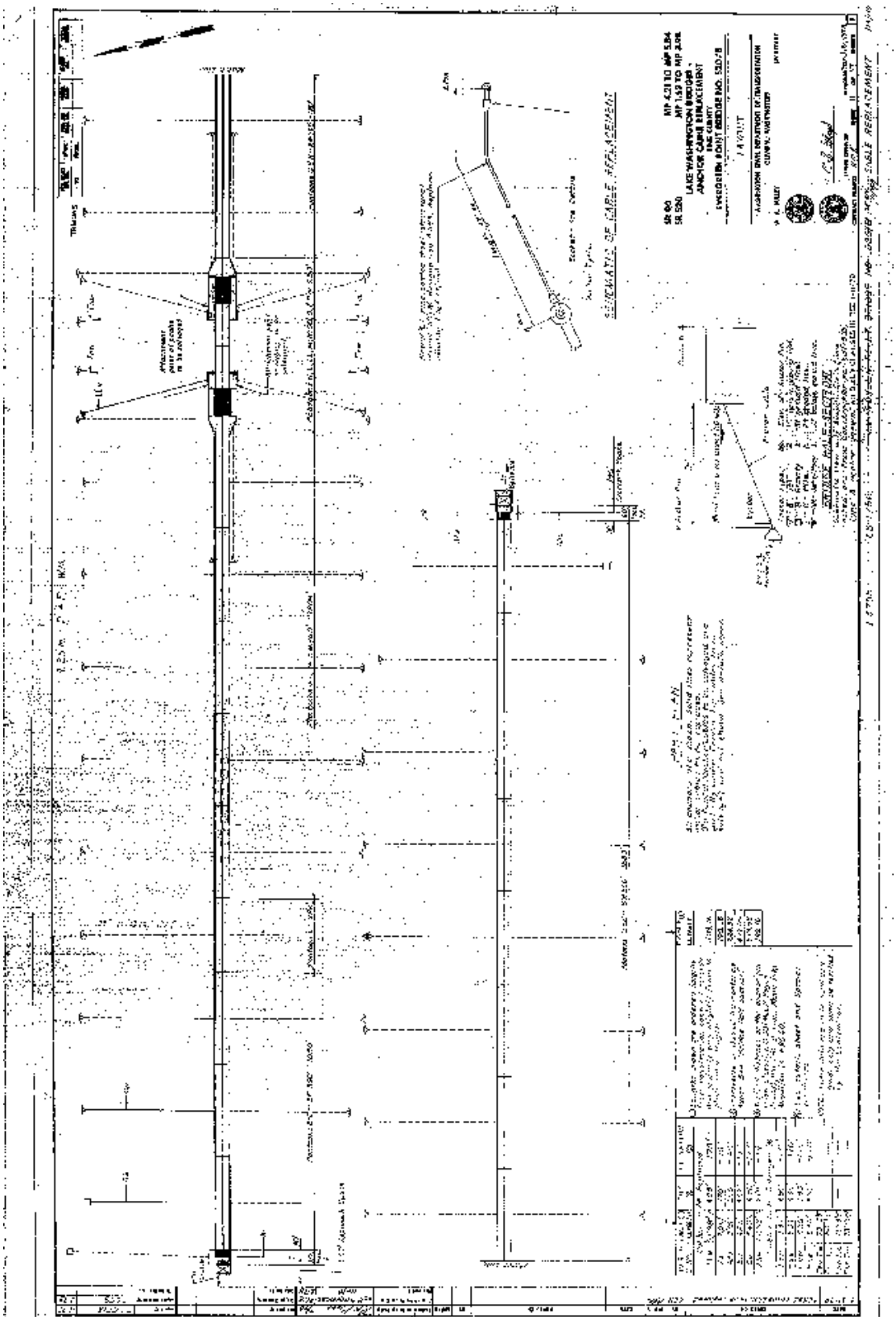

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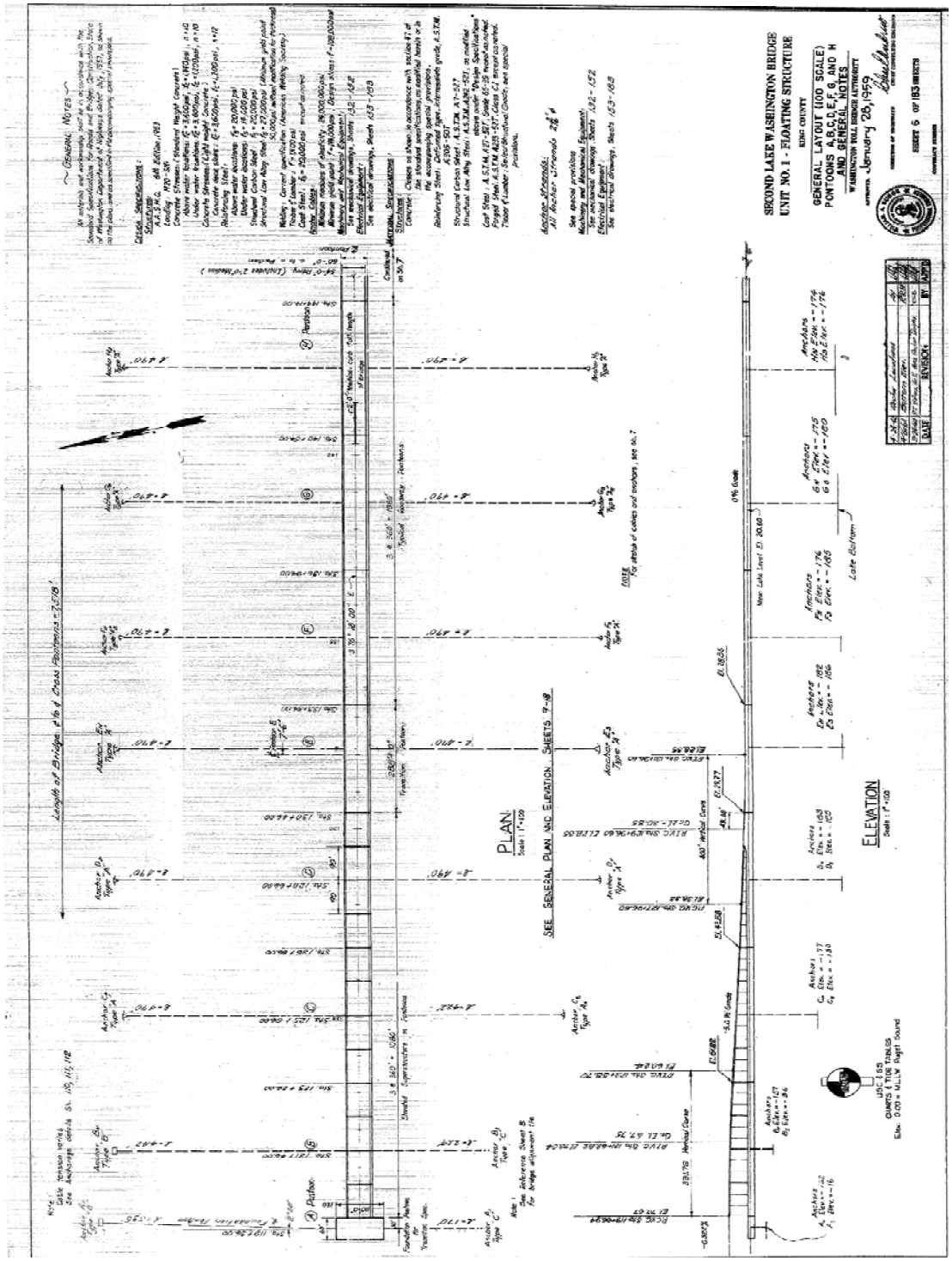

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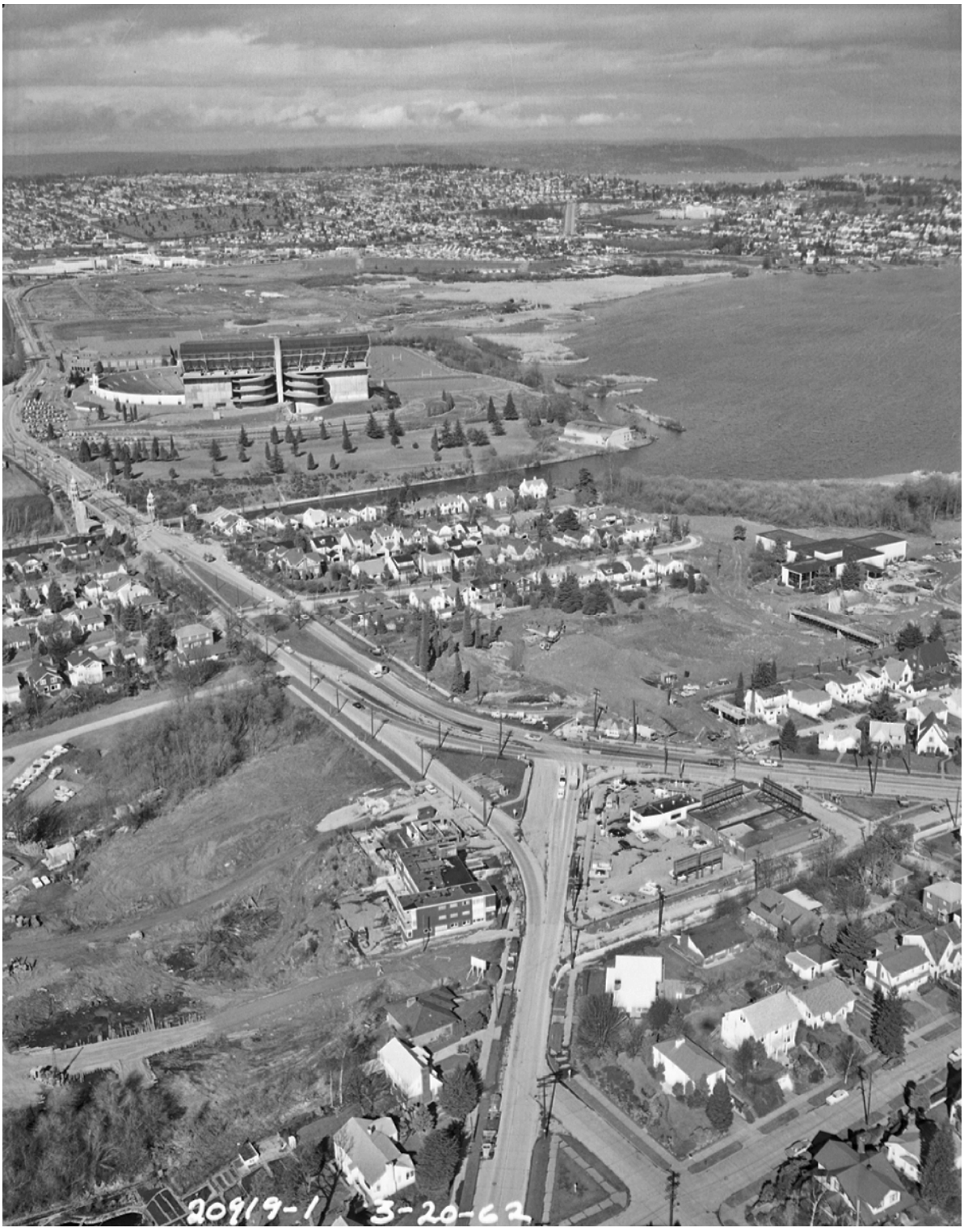

Seattle Municipal Archives. *Montlake Interchange*. 1962.
Photo Number 70334

Seattle Municipal Archives. *Montlake Interchange*. 1962.
Photo Number 71032

Seattle Municipal Archives. *Montlake Interchange*. 1962.
Photo Number 72827

Seattle Municipal Archives. *Montlake Interchange Progress*. 1962.
Photo Number 73142