

The
Richmond
Canals

The Richmond Canals Plan

**A Conceptual Master Plan
for the Restoration and
Development of
Richmond's Historic Canals**

**prepared for the
Historic Richmond Foundation
through a grant from the
Richmond Industrial Development
Authority**

**by
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Williamsburg, Virginia**

March 22, 1988

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Introduction

If you ask around town, you will not meet many people who know the extent of Richmond's original canals. Time has brought major changes to the city so that the route of the original canal is difficult to find. It is hard to imagine today that the canal stepped up to a large 600' x 200' great basin just a few blocks below Jefferson's Capitol building and then continued as far west as Lexington and Lynchburg. During recent years, however, a handful of citizens and planners have reminded us that the canal still existed. Many people have contributed for the research and documentation of the canal. Some, such as Dr. William Trout of the American Canal Society, faced oncoming bulldozers to collect and protect canal artifacts. Some companies, such as the Reynolds Metals Company, have worked successfully to save and restore the original canal on their properties.

On the immediate horizon, a major part of the canal is threatened by the proposed construction of the new floodwall. With the floodwall project approaching construction, Mr. A. Howe Todd (formerly Director of Planning and Assistant City Manager) organized a citizen canal committee, under the auspices of the Historic Richmond Foundation, to explore the possibilities of canal restoration. Our firm, Carlton Abbott and Partners, was retained to work with this committee as part of an urban design team. This report was developed over the last six months, and is a synthesis of our collective efforts to master plan a future for the Richmond Canals.

Carlton S. Abbott, FAIA
March 24, 1988

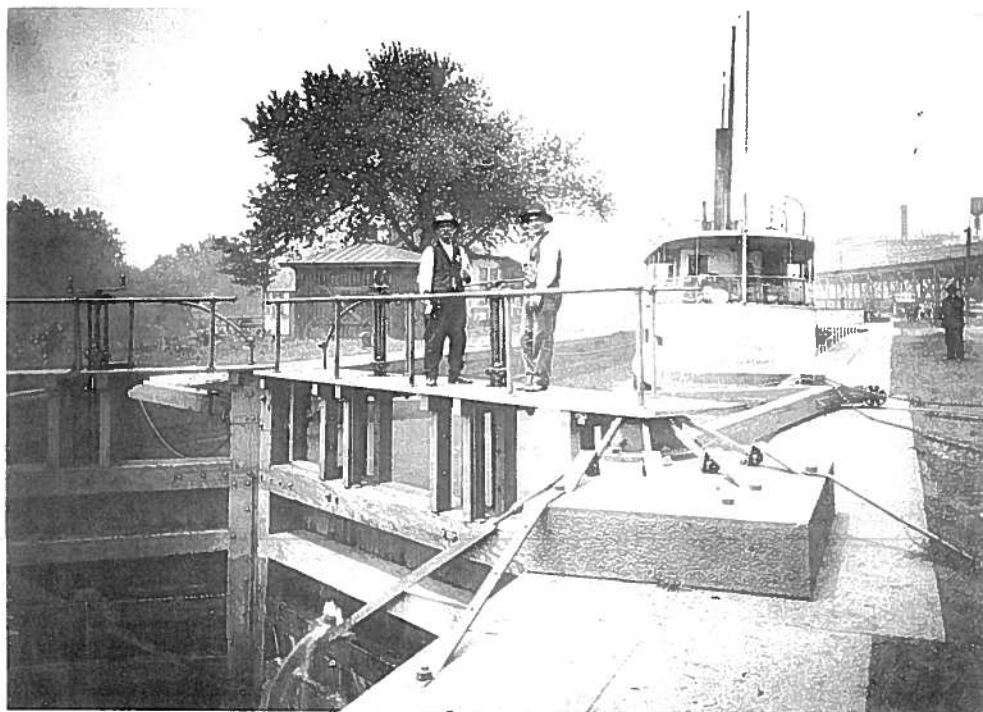
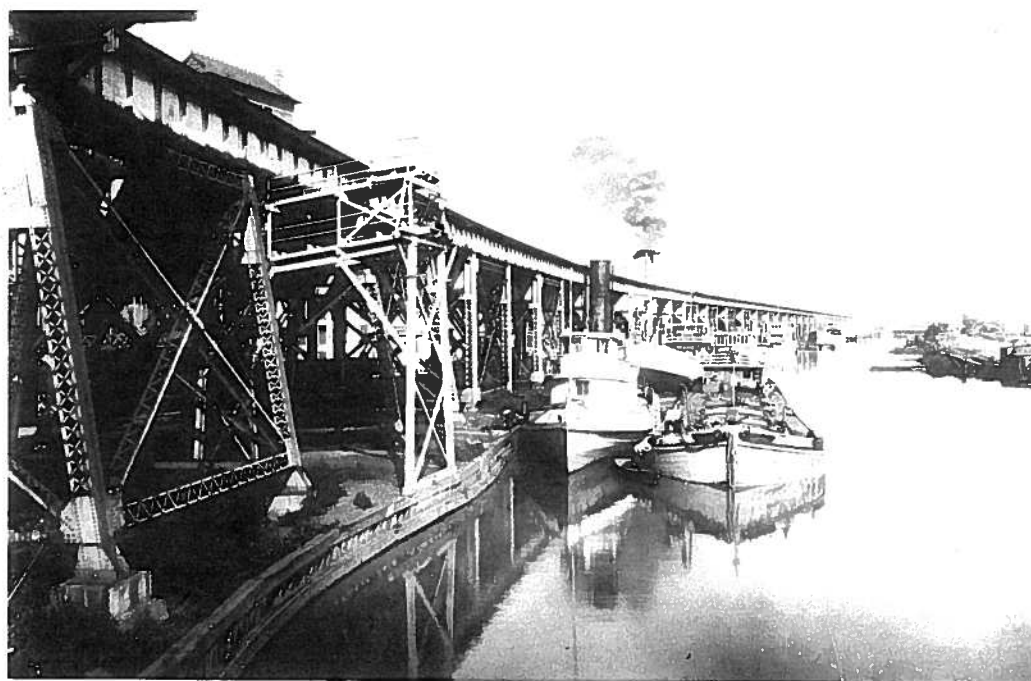
History of the Canal in Richmond

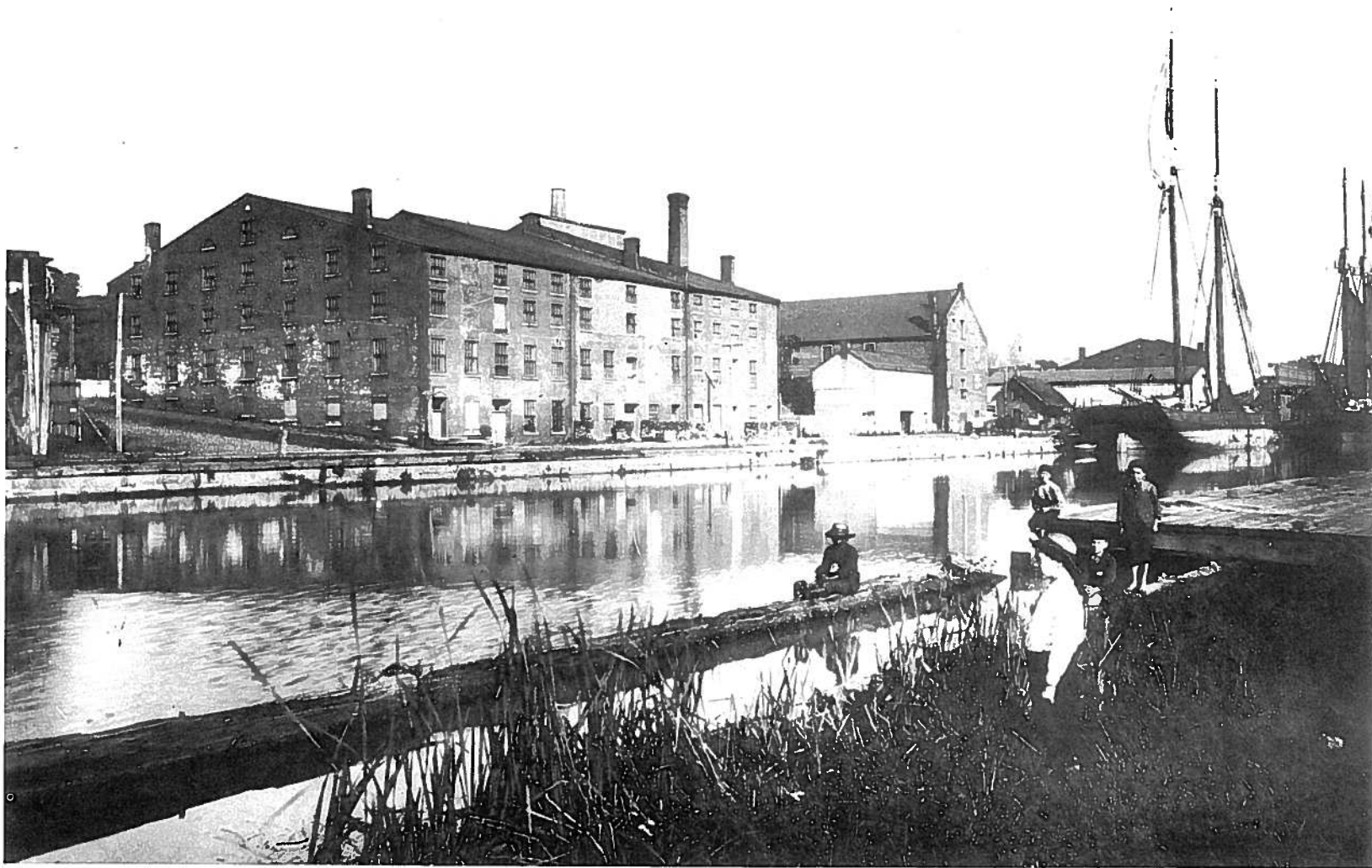
In 1607, 10 days after landing at Jamestown, Captain Christopher Newport led a party of 20 settlers up the newly named James River to its fall line at present day Richmond, a natural major point of trade as it was the western limit of seaborne navigation. The cities of Richmond, Petersburg, Fredericksburg and Washington all grew out of the places of trade at the fall lines of their respective rivers. Later those cities built canals to bypass the fall-line rocks to develop commerce inland. A waterway west was discussed in the General Assembly as early as 1765; and by 1785, the James River Company was formed by the Commonwealth of Virginia with George Washington as an Honorary President. Early plans called for the canal to extend from below the falls of the James in Richmond westward over the Allegheny Mountains to connect with the Kanawha River in West Virginia. This route would have provided a continuous navigable passage to the Ohio River and the Mississippi River, opening Virginia's saltwater ports to trade with the developing western territories. By 1789, the first seven-mile section was completed in Richmond.

In 1800, the Great Basin was completed and opened to canal traffic. Now the site of the James Center complex below Jefferson's State Capitol building, it was about 600 feet long by 200 feet wide, creating a vital commercial trade center for Richmond. The first Tidewater Connection locks were completed in 1812, linking the Great Basin with the river below the falls. The Richmond Dock was developed in 1822 so that ships could enter from the river. The present Great Ship Lock was completed in 1849, simultaneously with the final Tidewater Connection locks, of which the two restored by Reynolds Metal Company remain. From the Great Basin the canal proceeded westward on an even gradient to 3-mile locks at Byrd Park. By 1840, the canal had been extended as far as Lynchburg and by 1851 to Buchanan. In 1854, it is recorded that 195 canal barges, bateaux and passenger boats were in operation.

The canal functioned intact through the Civil War, but in 1879 the Richmond and Allegheny Railroad purchased the canal company and built its tracks on the canal towpath. The Great Ship Lock and adjacent Richmond Dock remained active through the first half of this century.

These early 20th century photographs
are of the Richmond Dock (right) and
the Great Shiplock (below).
(Photographs courtesy of the
Valentine Museum.)



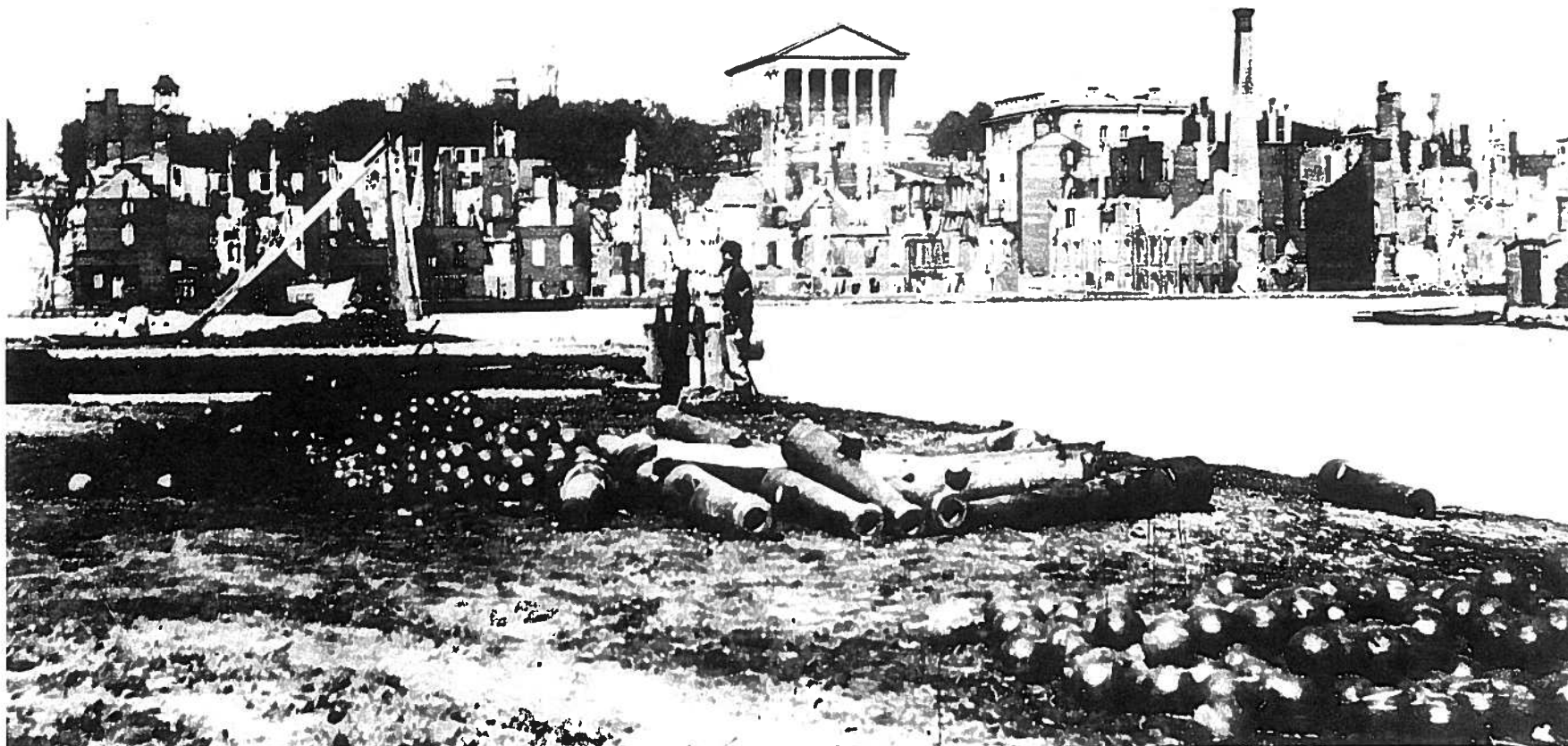


View of the Richmond Dock showing Libby Prison and some tall ships. Photograph taken in the late 1800's. (Photograph courtesy of the Valentine Museum.)

The current condition of Richmond's canal system is as follows:

Major parts of the James River and Kanawha Canal have been destroyed and other parts have been irretrievably isolated. However, enough original canal sections still exist to make a new Richmond Canals project possible. Some of those original canal sections have open water, some are underground, and some have been filled or partially dammed and only lack water.

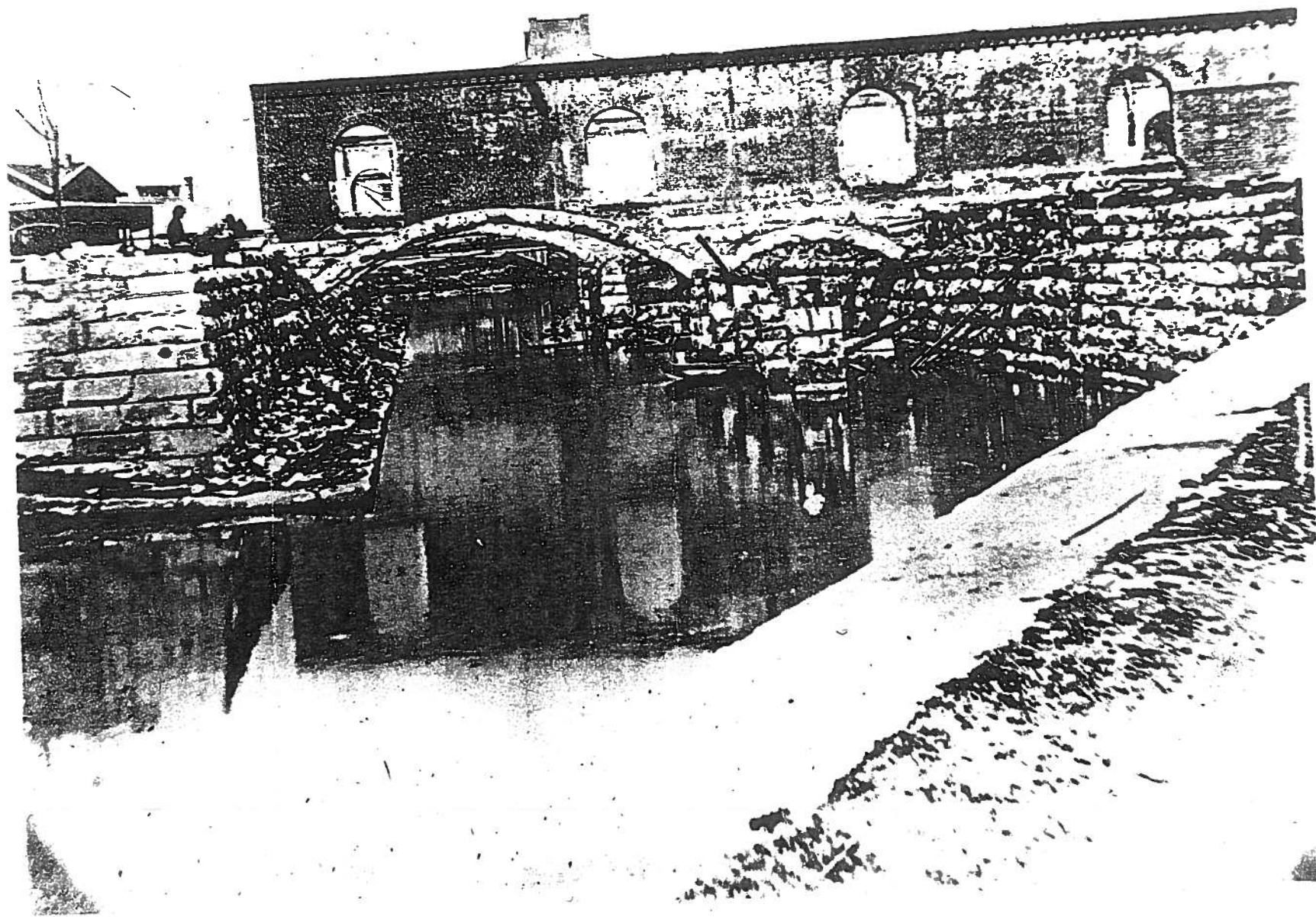
Several urban amenities along the canal route have greatly enhanced the area, and would contribute to the overall success of the Richmond Canals Plan project. These include the Reynolds Metals locks at 12th Street, the City's and Richmond Renaissance's Riverfront Walk improvements along the Haxall Canal, the Richmond Metropolitan Authority's salvage of some lock stones and Ethyl Corporation's restored Tredegar Works.

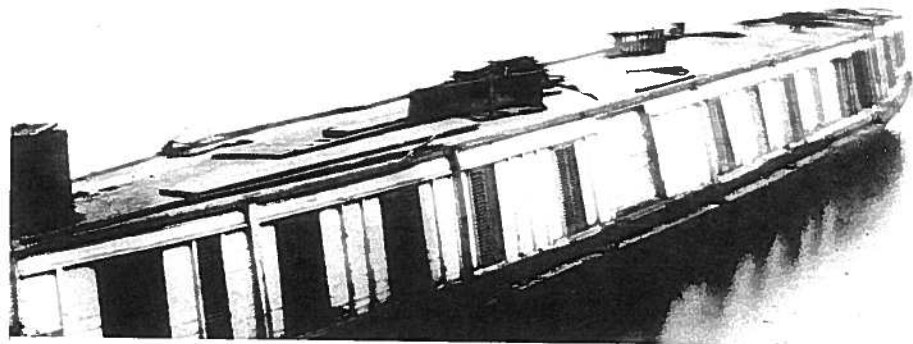
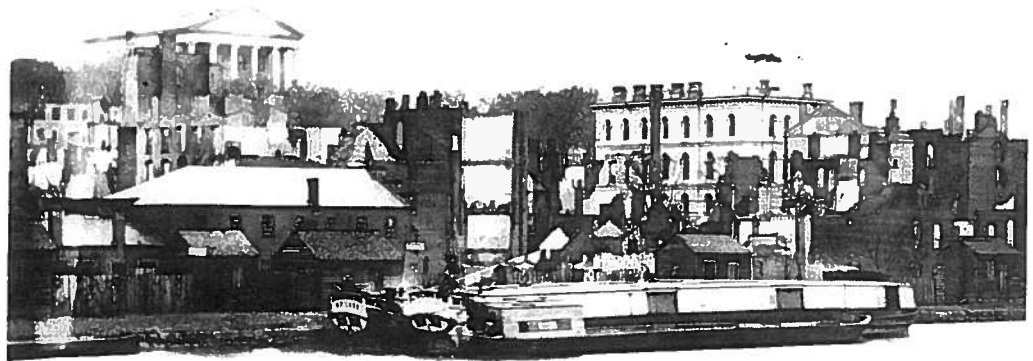


View north across the Great Basin to the Virginia State Capitol, late spring of 1865. (Photograph courtesy of the Valentine Museum.)



View of the Canal looking west. The arched bridge is 13th Street.
Late 19th century. (Photograph courtesy of the Valentine Museum.)





These c. 1865 photographs show the Great Basin (above) and the Canal as it heads west from 7th Street. (Photographs courtesy of the Valentine Museum.)

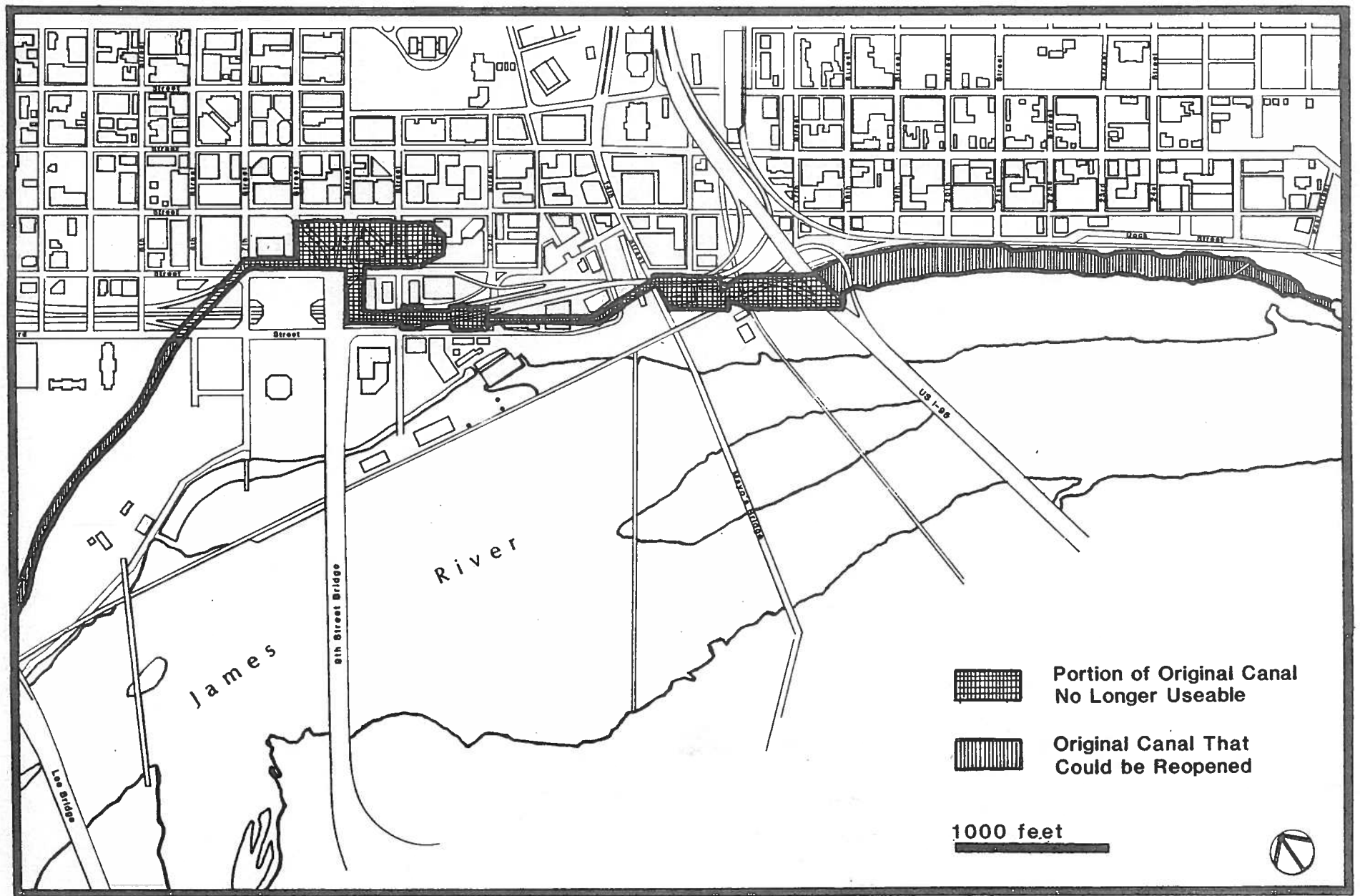


The Richmond Canals Plan

The Richmond Canals Plan is a conceptual master plan for the restoration and development of Richmond's historic canals. The objectives of the plan are to:

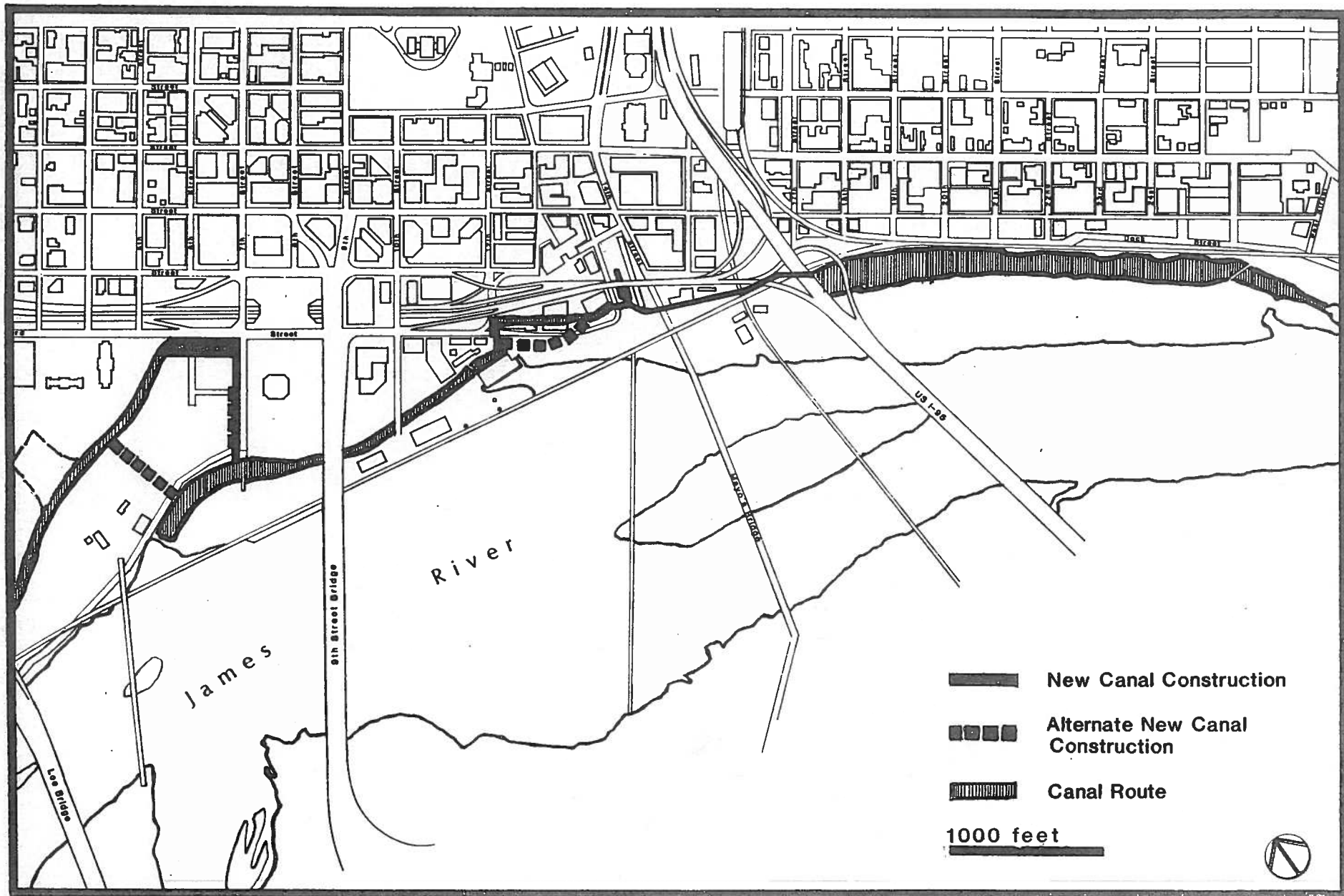
- * Promote the preservation and restoration of Richmond's historic canals;
- * Create a navigable passageway through the city from the Great Ship Lock below Tobacco Row to the city's western limits, following as closely as possible the course of the original canals;
- * Capitalize on this renovated water resource or linear park as an important new urban amenity and focus for major new development and downtown visitation;
- * Draw the city to its neglected waterfront and provide a substitute waterfront where the river is blocked by the floodwall;
- * Link the major areas of downtown development and revitalize neglected areas, encouraging creative new buildings and open spaces along the canal consistent with the development interests of property owners;
- * Enlist widely based public and private support for the Canal Project;
- * Establish as a high priority the engineering design and construction of the first phase section between the Great Ship Lock and Virginia Street, which can be a viable, relatively low cost, high-return project of major visibility;
- * Encourage future restoration of the canal to Three Mile Lock and to Five Mile Lock, and eventually westward to Lynchburg, Buchanan and Lexington.

The Richmond Canals project would be a major asset to Richmond. The urban waterway would bring excitement and revitalization to downtown while also uniting the historic and progressive images of the city.



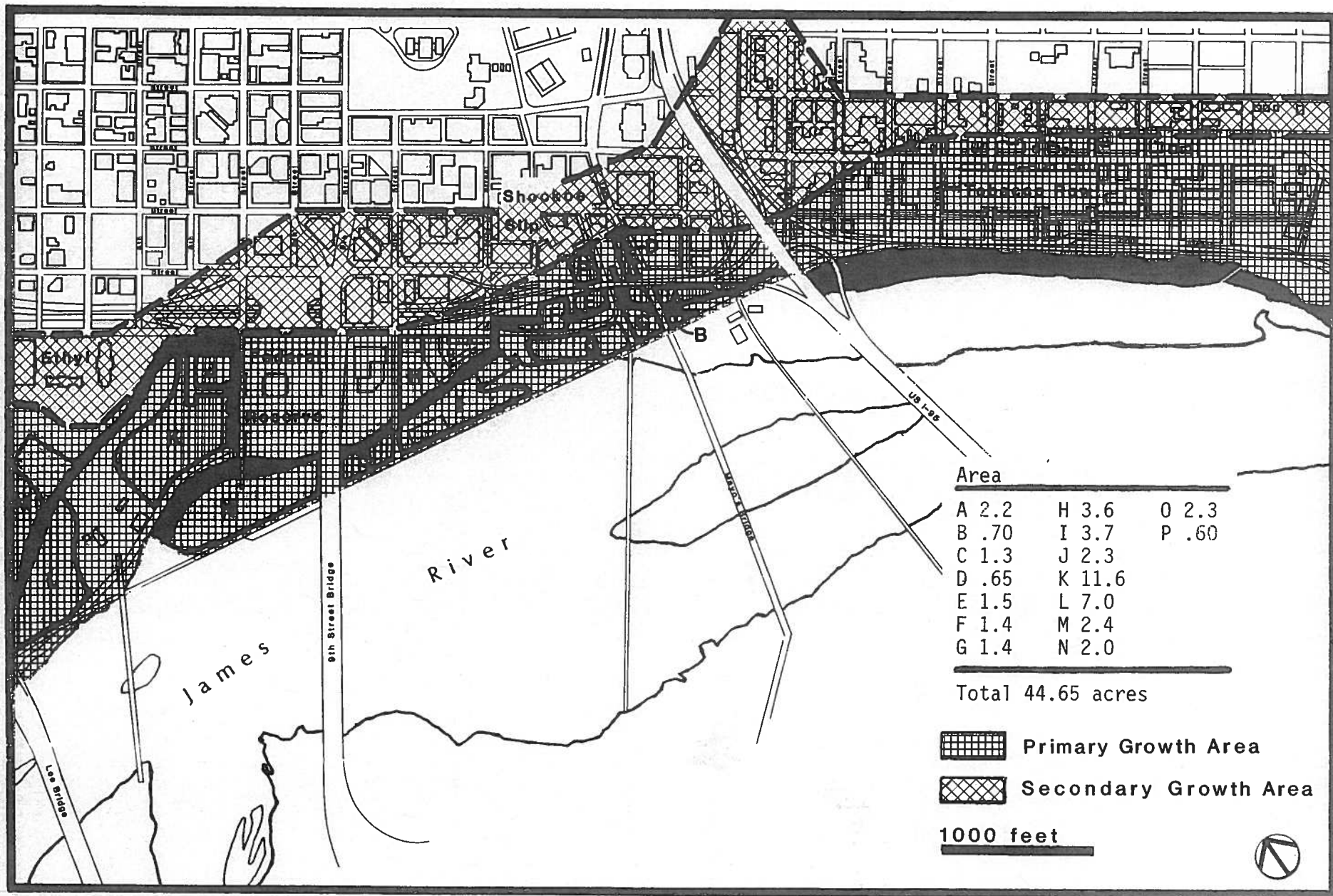
Richmond's Original Canals

Richmond Canals Plan



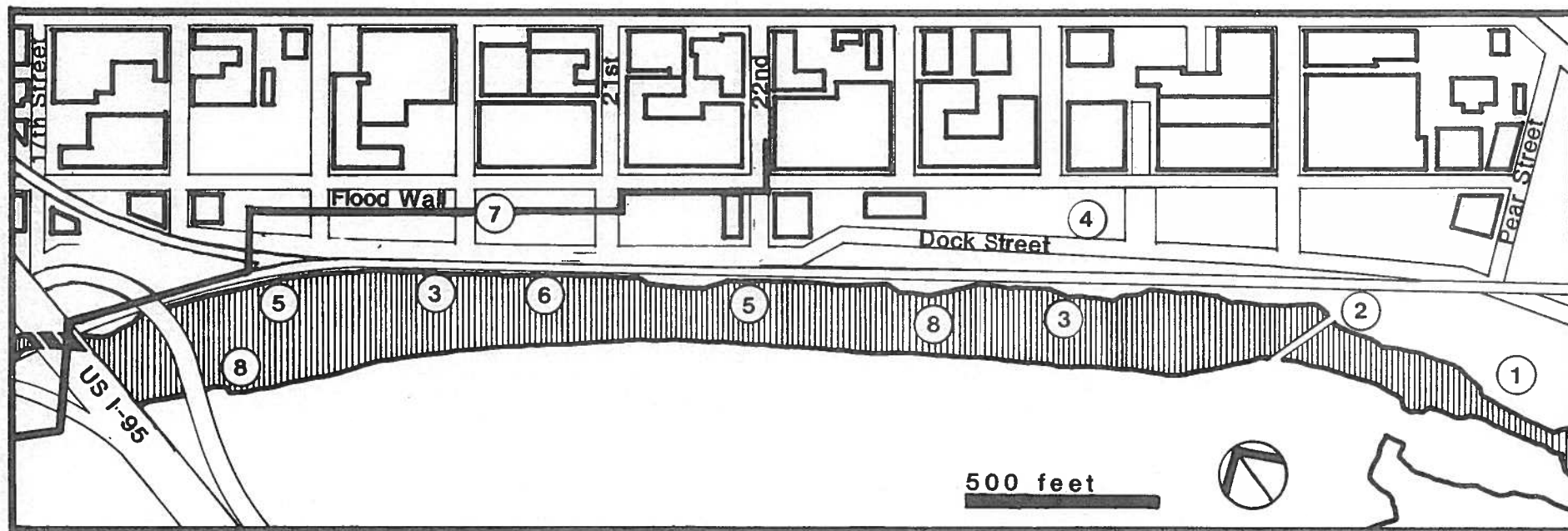
Proposed New Canal Construction

Richmond Canals Plan



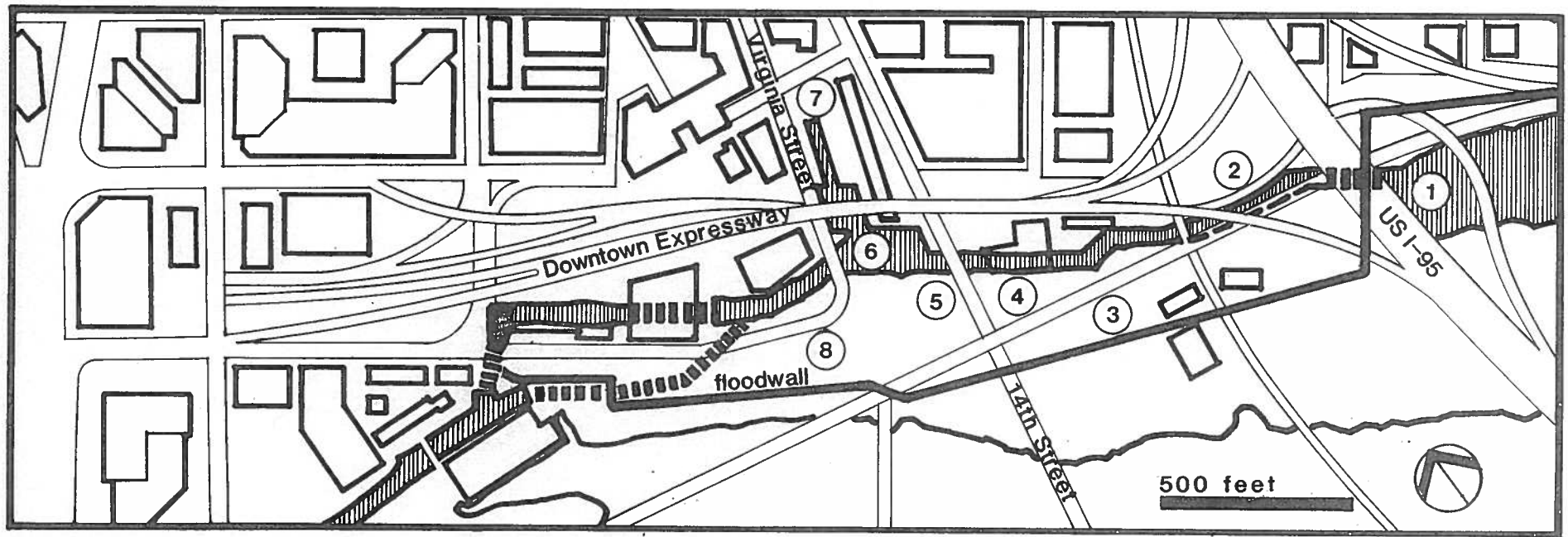
Potential Development Areas

Richmond Canals Plan



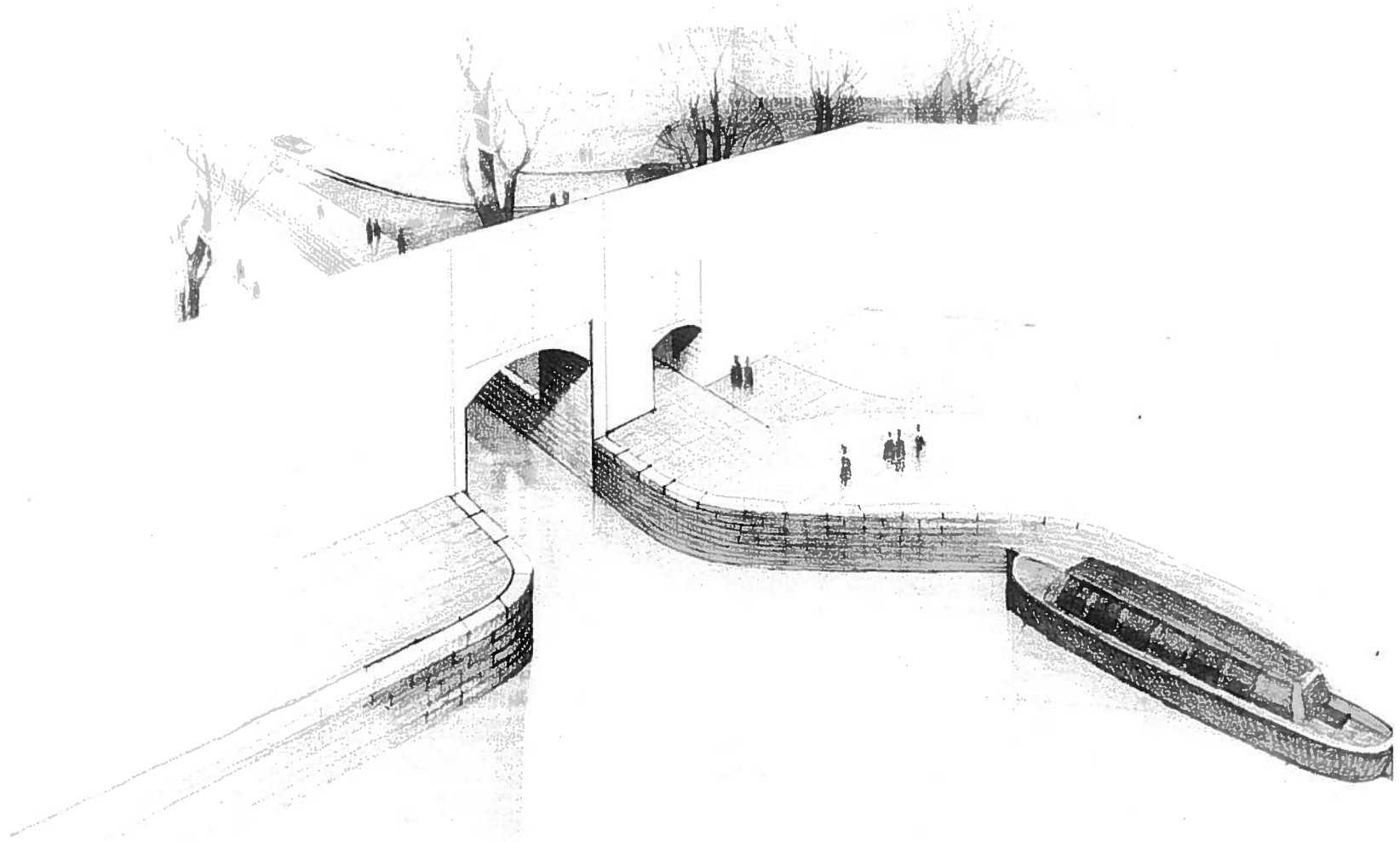
Richmond Dock Development

1. Restore the gates of Great Ship Lock.
2. Reactivate the railway drawbridge.
3. Clean up and restore the edges of the Richmond Dock and coordinate with possible marina development.
4. Provide new pedestrian routes from Tobacco Row down to the canal.
5. Develop a walk along the Richmond Dock.
6. Utilize the docking space for the basing of tall ships, paddle wheelers, and other small boats.
7. Interpret the site of Libby Prison and other points of interest.
8. Dredge silt and remove debris from bottom.



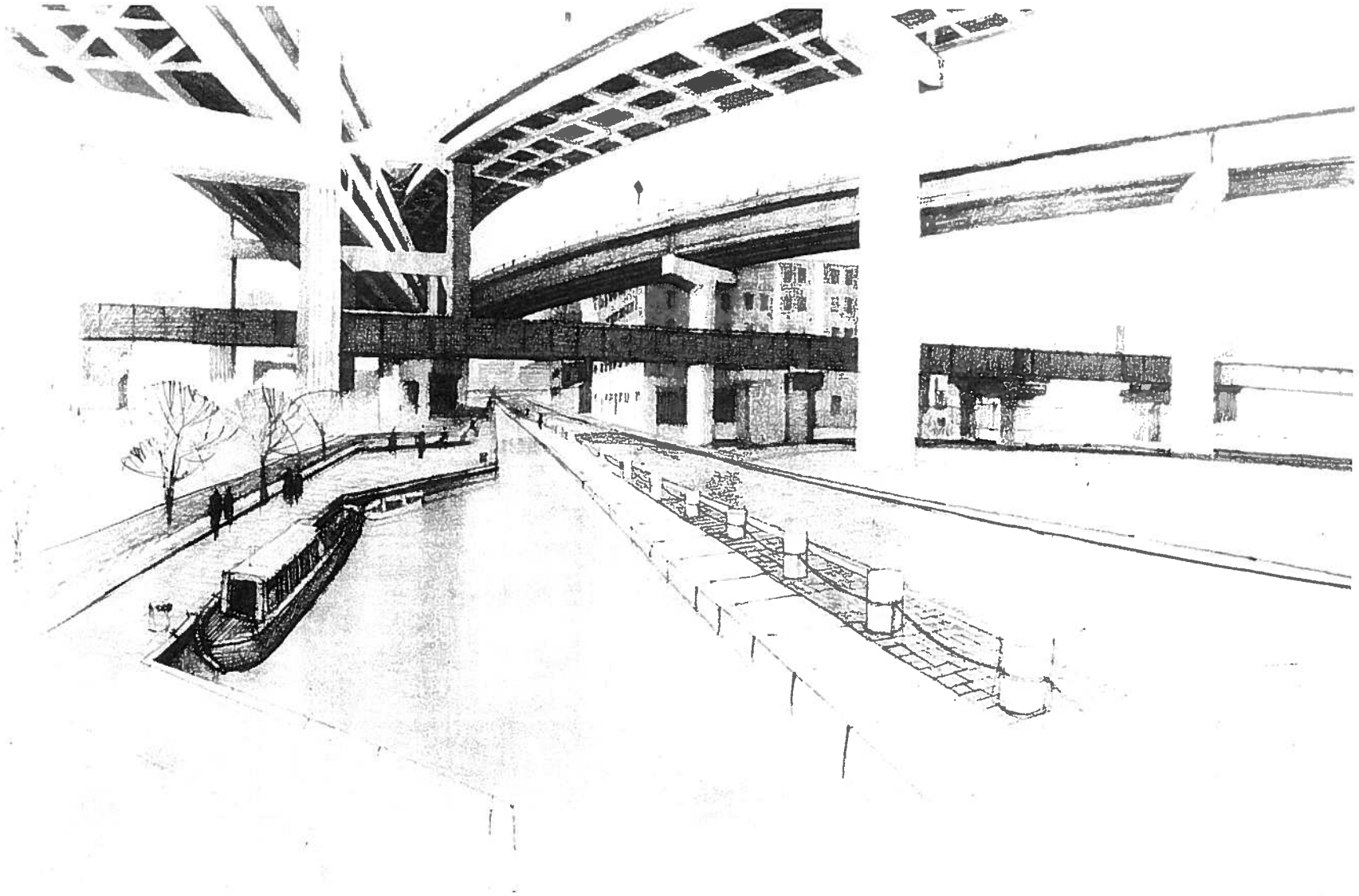
Richmond Dock to Virginia Street (Phase One)

1. Coordinate and construct a door for the canal through the new floodwall at a point just east of 17th Street.
2. Build a new canal section through the "spaghetti works".
3. Remodel subsurface utilities and other obstacles to the canal route. Of particular concern are the large underground storm sewers.
4. Work with property owners to establish the best possible route for development of the canal.
5. Construct a new bridge where 14th Street will cross the canal.
6. Restore original stone walls of the old canal and remove the existing concrete top.
7. Integrate the canal design with the proposed park. Provide adequate docking space for canal boats.
8. Improve the bridge at Virginia Street.



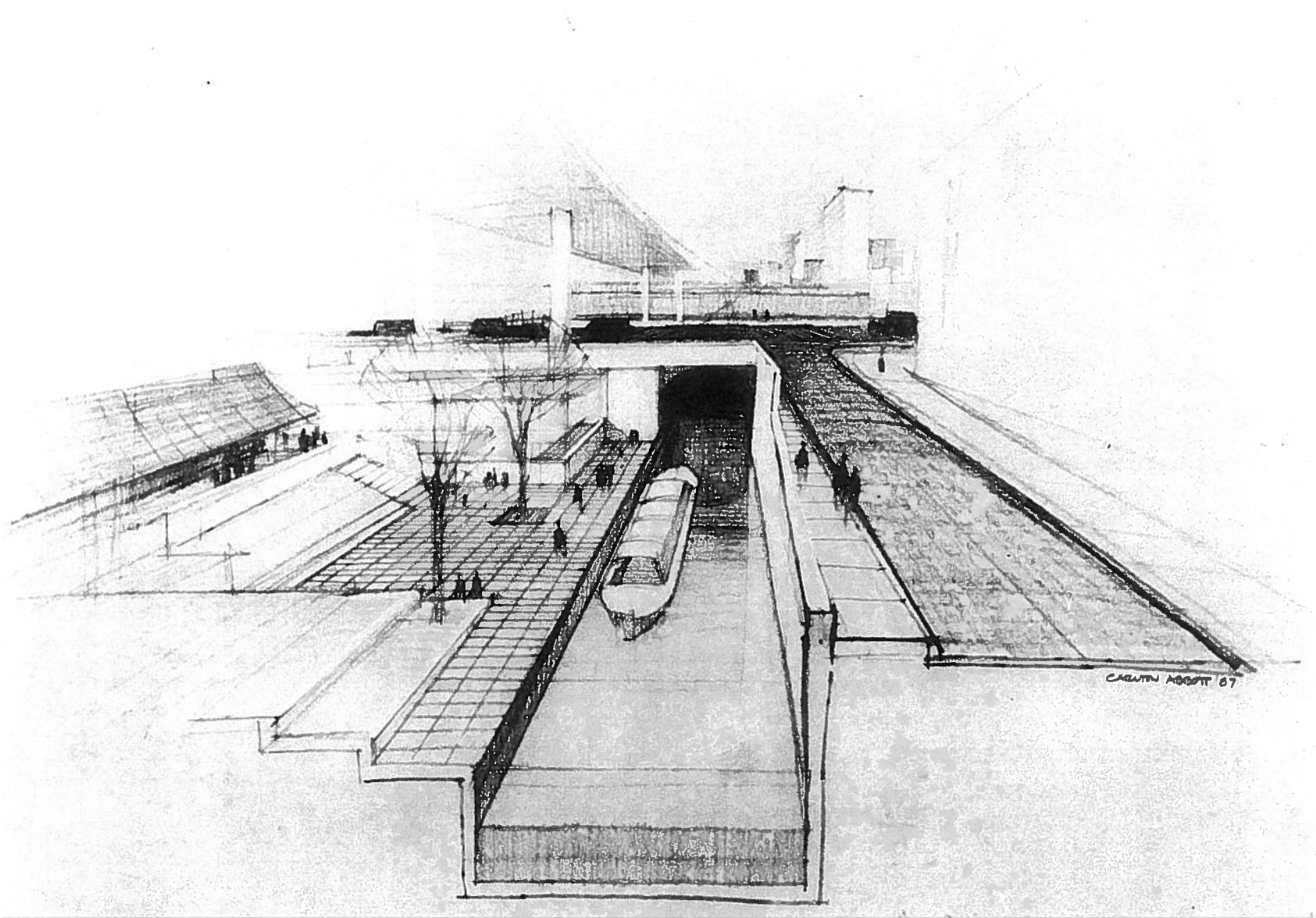
CATEMUN APBOTT 88

This drawing shows how the canal could pass through the new flood wall. The view is at the head of the Richmond Dock looking west in the vicinity of 17th Street.

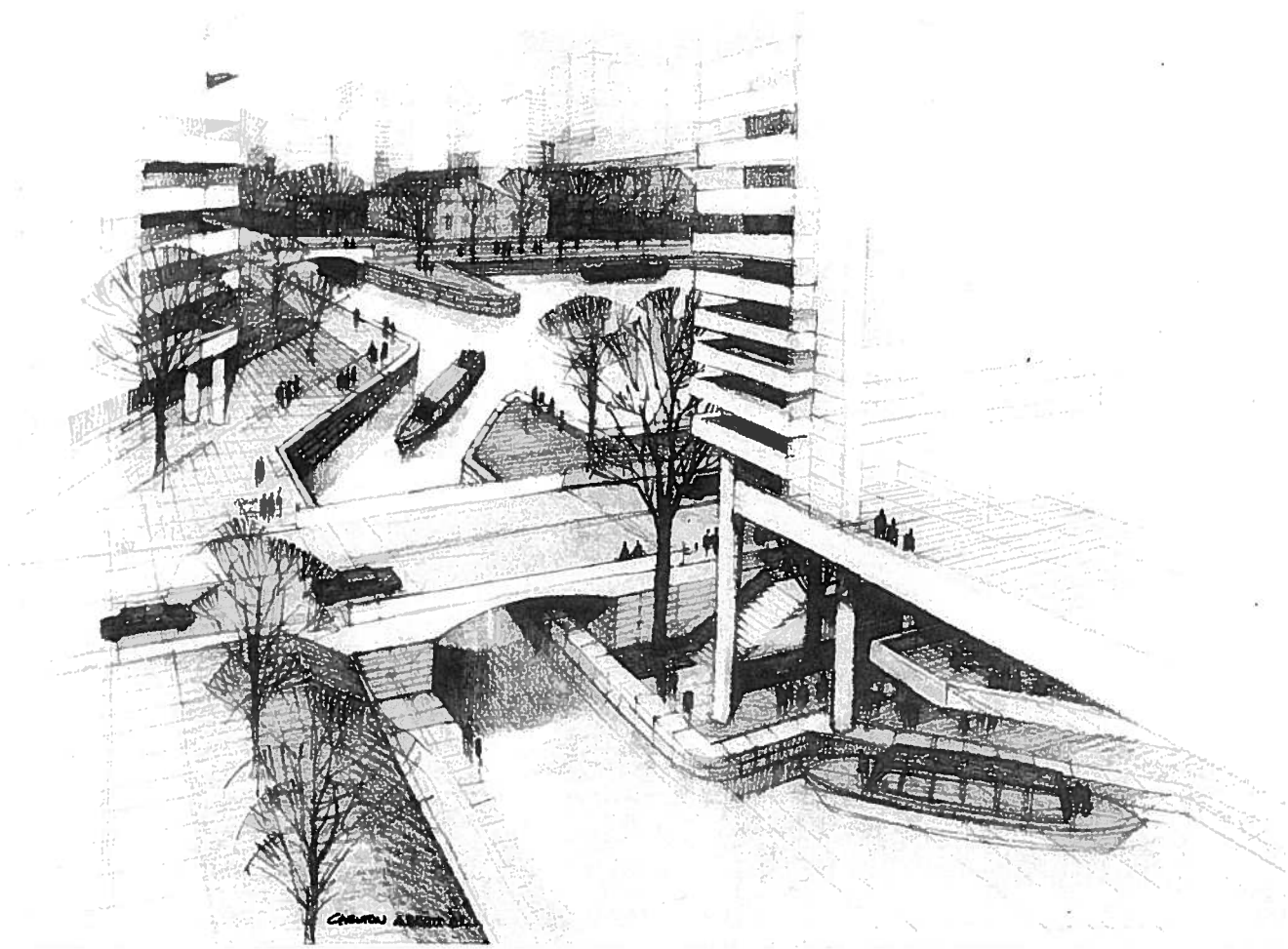


CARLETON ABBOTT '86

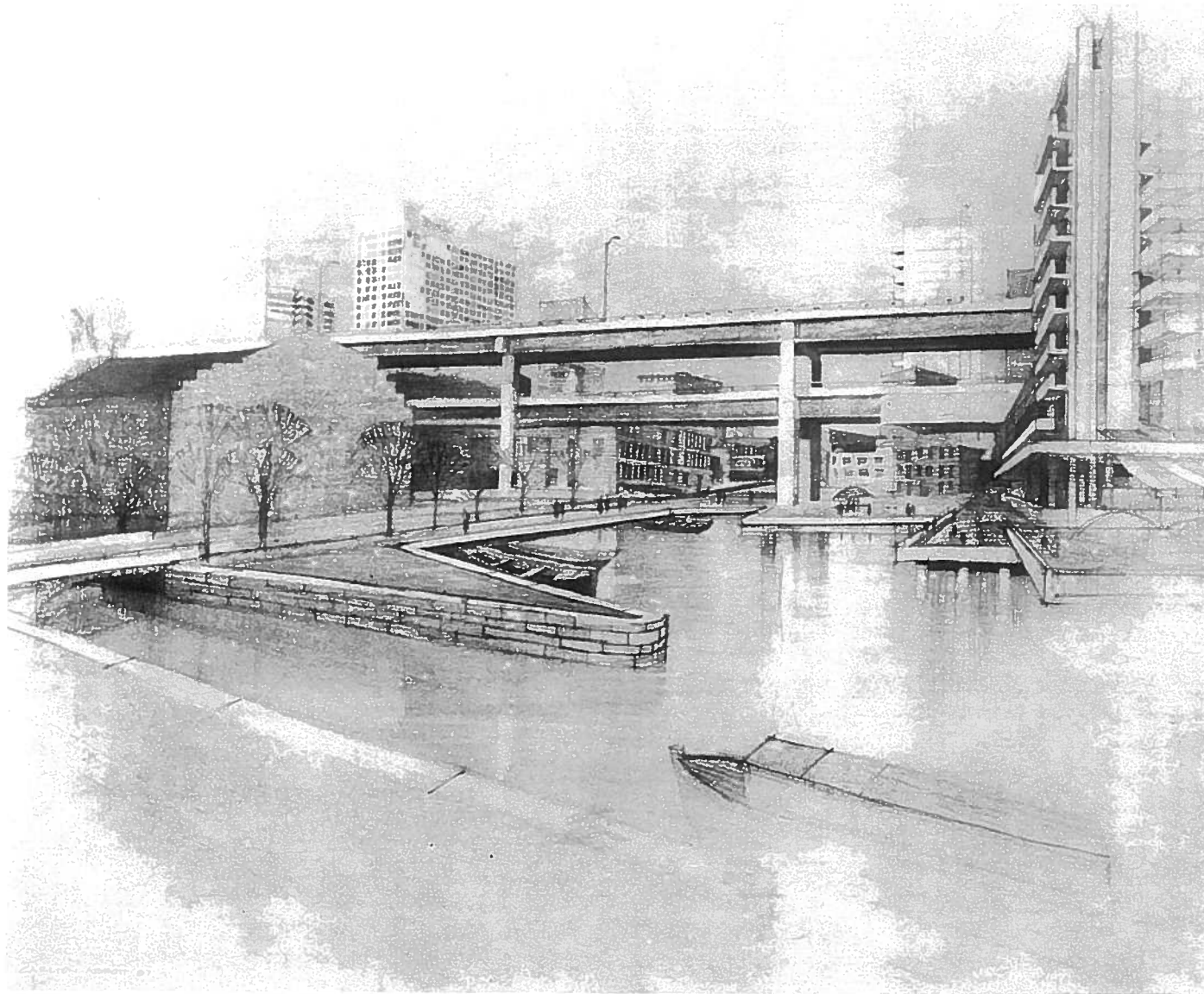
This conceptual sketch shows a possible alternative route of how the new section of the Richmond Canals could be routed through the "Spaghetti Works" as the canal goes west from 17th Street along Dock Street.



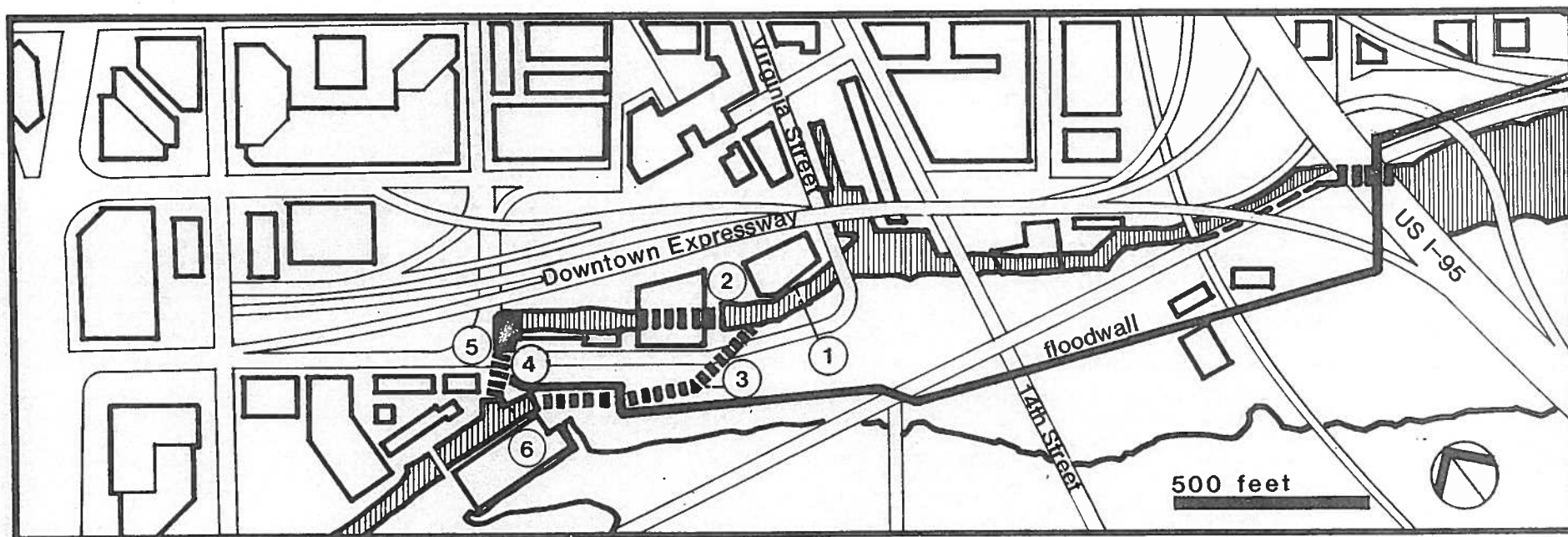
This conceptual perspective sketch shows an alternative of how the canal could pass by way of a tunnel under 14th Street as the Richmond Canal heads west.



This drawing shows a possible alternate route for the canal as the canal moves west under 14th Street. The concept envisions new development opportunities along the canal.

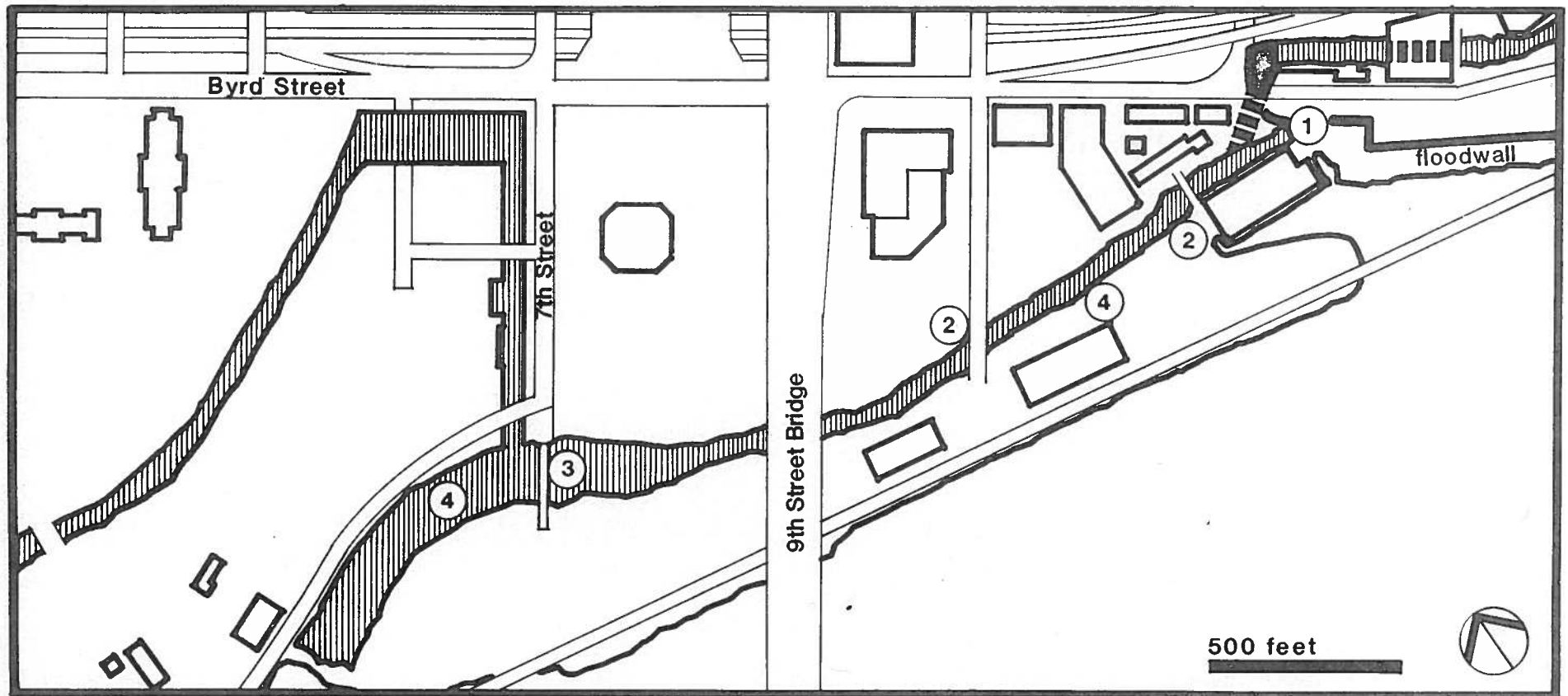


This conceptual perspective sketch is looking north toward the Shockoe Slip area. The original canal could be expanded here to provide a basin for the docking of canal boats. This new basin can be linked to the park proposed for the site just beyond the overhead RMA Expressway bridge.



Virginia Street to the Haxall Canal

1. Dredge existing channel of original canal.
2. Remove earth berm when the floodwall is completed and open east end of the locks at Reynolds.
3. Evaluate alternate canal route and locks. Integrate canal route with floodwall and utilities. Consider possibility of using the Reynolds locks for demonstration only if alternate canal route is preferable.
4. Install door in floodwall for canal passage.
5. Develop new channel to link top of Reynolds locks under 12th Street and down to the Haxall Canal. Allow appropriate turning radius for canal boats.
6. Divert Haxall Canal water through the Reynolds locks.

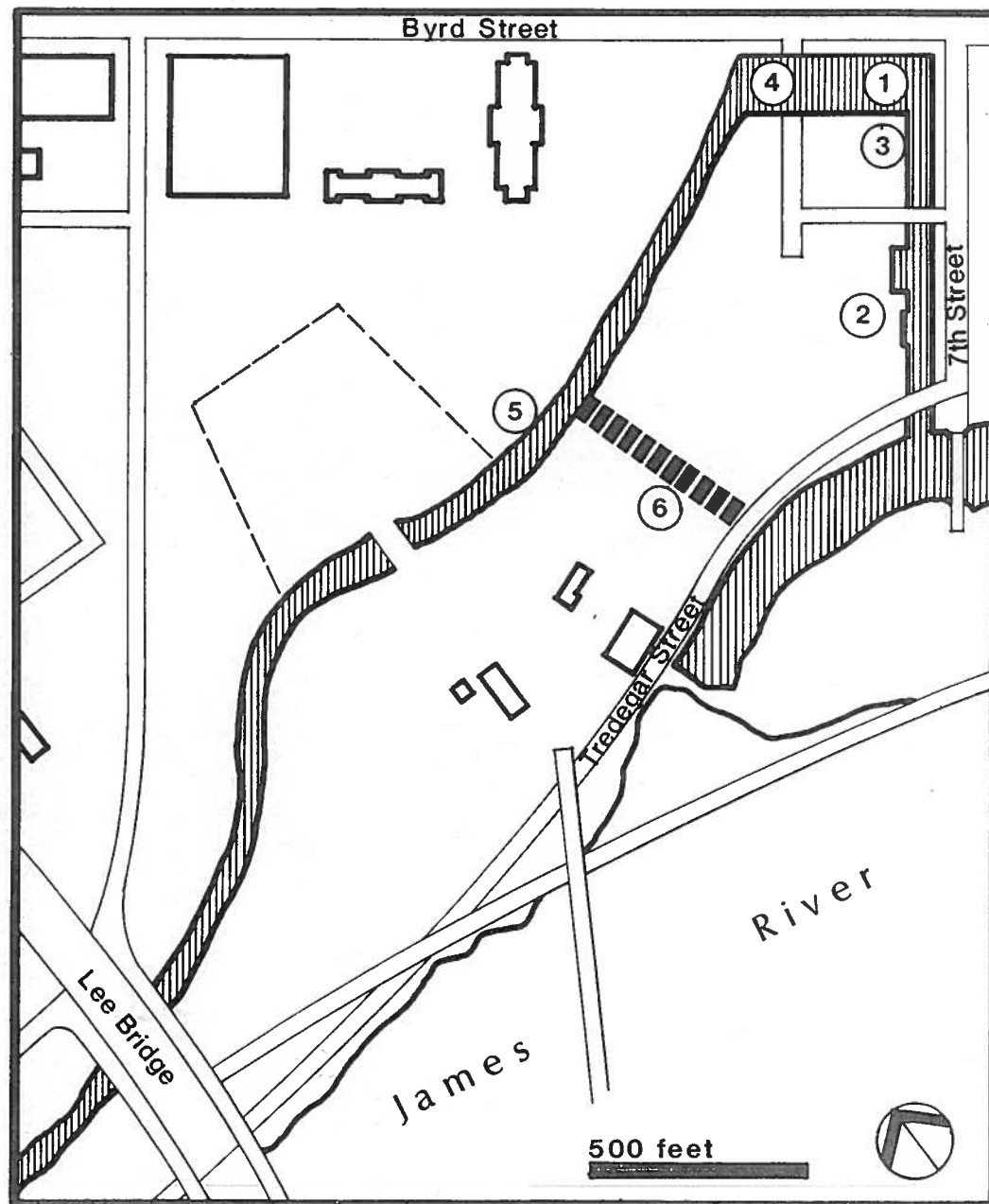


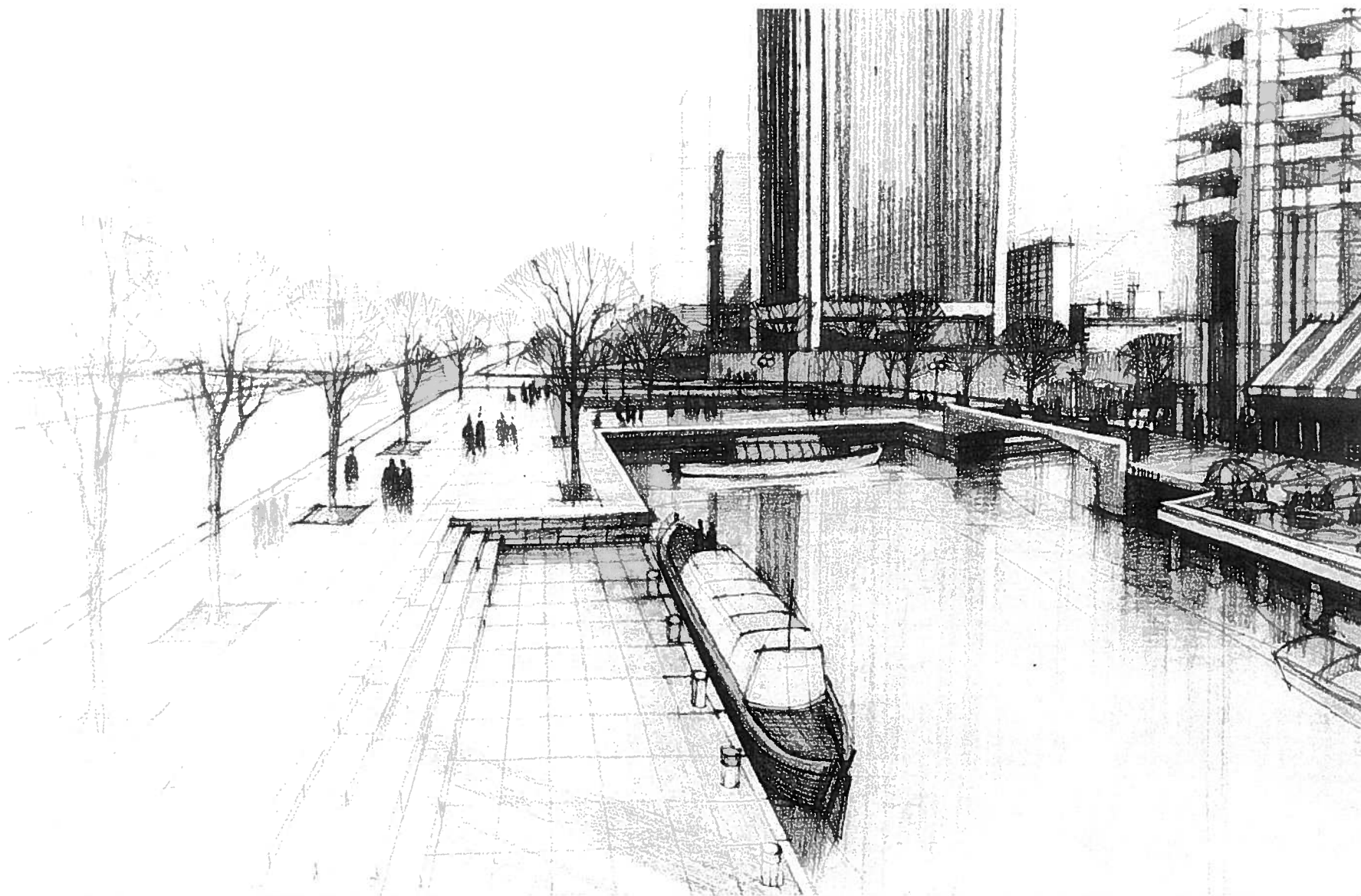
Haxall Canal

1. Provide turning radius for canal boats.
2. Remove obstacles such as pipes and utilities.
3. Utilize new pedestrian bridge for access to 7th Street.
4. Dredge and clean the canal bottom.

Haxall Canal to Tredegar Iron Works

1. Develop canal as close into the city as possible.
2. Construct new locks up to a new turning basin.
3. Build a new turning basin that is large enough for a restored canal boat to turn.
4. Use the turning basin as a terminus for canal boat tours going west to Maymont, Byrd Park and 3-Mile Lock.
5. Excavate and reuse the original canal to the greatest extent possible.
6. Consider alternate routes near Tredegar Iron Works.





This conceptual perspective sketch depicts a new turning basin to be part of the Richmond Canals. The view is looking east along Byrd Street toward the intersection with 7th Street.



Conceptual perspective sketch looking north along a proposed new section of the Richmond Canals, 7th Street and the Federal Reserve Building are on the right. Byrd Street is beyond.

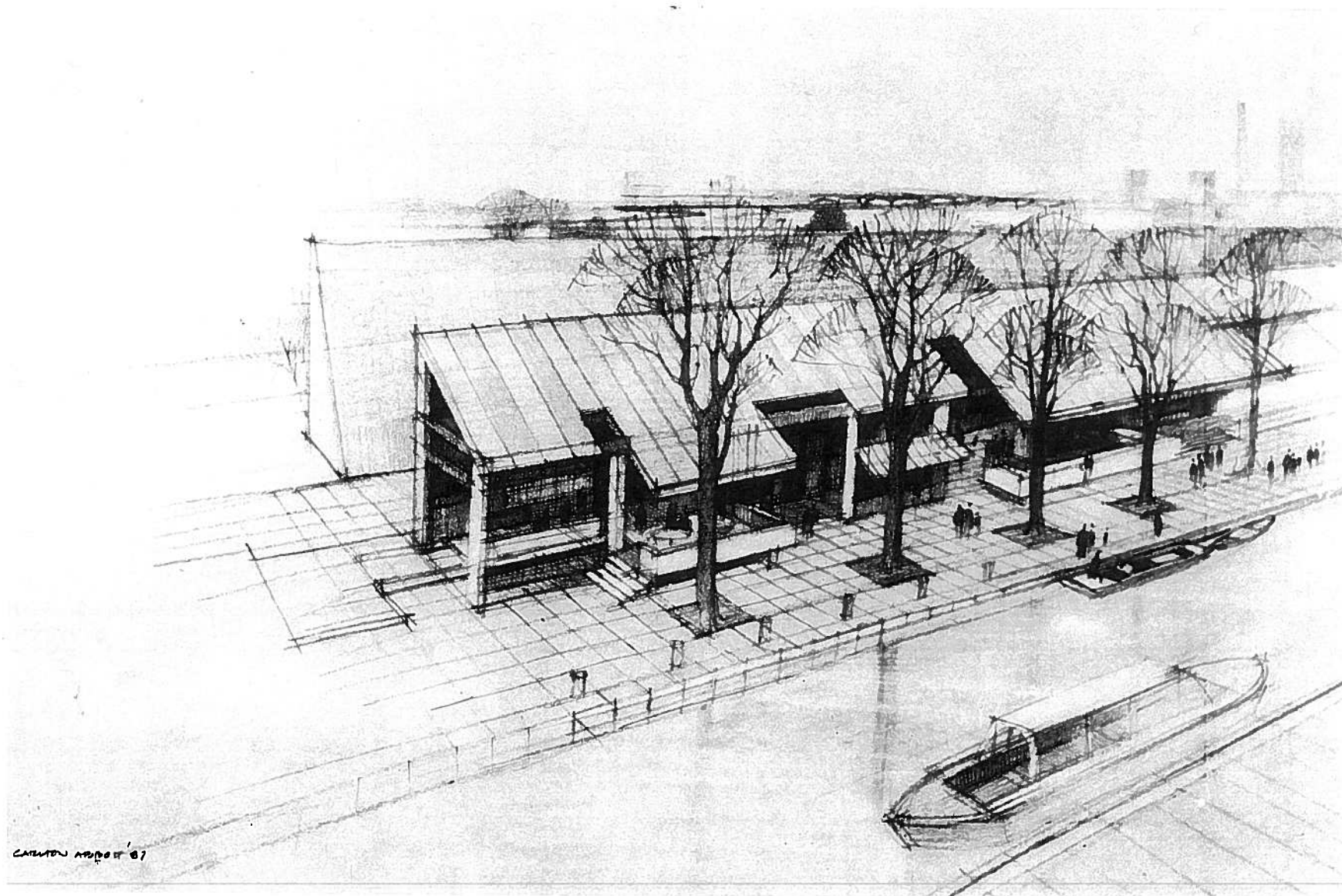
Economic Development Along the Canal

An attractively developed waterway within a city is often an important catalyst for new urban development. In Richmond's case, the canal and its walkways form a spine along which urban growth can occur. The resulting development of the inland side of the proposed floodwall will bring Richmond's waterfront into the city.

Recommendations for Development:

- * Promote compatible land uses along the canal corridor, including structures adjacent to or even straddling the canal. Encourage shopping, eating, entertainment, housing, and meeting places at appropriate locations. Make the canal an attractive and festive place to be.
- * Determine areas (totalling approximately 44 acres) for new building construction as well as open space along the canal, and work to have them included in the City's master plan.
- * Enhance the economic, aesthetic and demographic impact on the downtown beyond the immediate edges of this spine of development. Maximize the drawing power of this new "people magnet".
- * Institute guidelines for new development along the canal. Include strongly outlined design and aesthetic controls for both historic and contemporary construction.
- * Encourage new architecture that will be sympathetic to historic Richmond while recognizing the character and scale of Richmond's high-rise skyline.
- * Support the long range master-planning goals of the canal to extend uninterrupted through the city.
- * Recognize and protect successful urban and natural environments along the canal.

- * Satisfy the city's need for certain types of new development, such as housing. Create new gathering places that capture the spectacular vistas of the canal and the Richmond skyline.
- * Work with the U.S. Army Corps of Engineers to establish guidelines for building adjacent to the new floodwall.
- * Seek creative funding for canal development and operation, including the establishment of special tax assessment districts graduated by proximity to the canal.
- * Encourage civic organizations to participate in canal development and promotion.



This sketch study shows how new development could be placed on the inside of the new flood wall with frontage on the Richmond Canals.

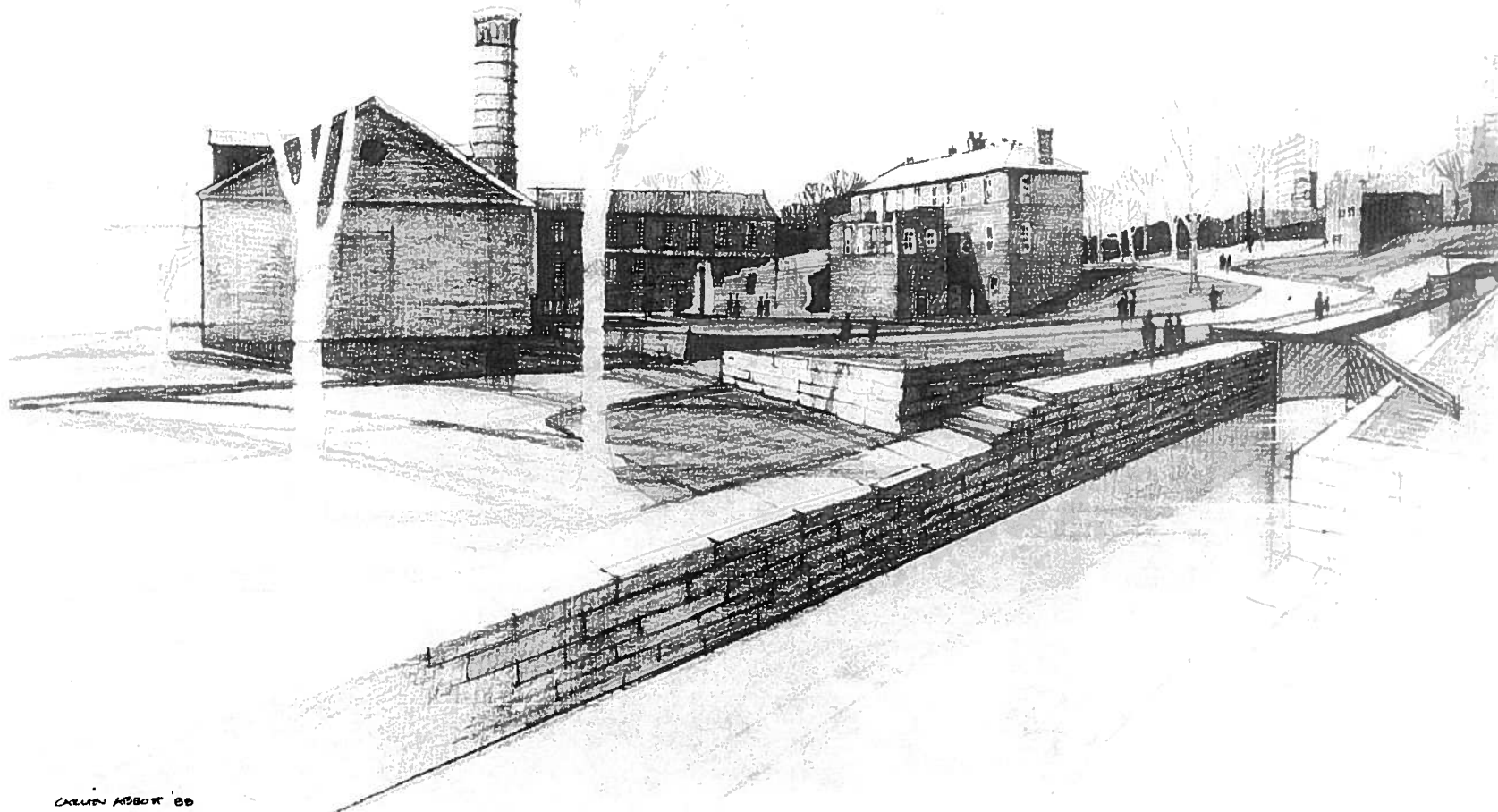
Historic Preservation

Sections of the canal that remain in the City of Richmond are historically significant and should be preserved as an important National Historical Landmark. Opened to navigation through the city in 1789, the canal was one of the earliest man made water transportation routes in North America. During the latter part of the 18th century and for most of the 19th century, the canal contributed greatly to the development of Virginia and also the nation.

Recommendations for Preservation:

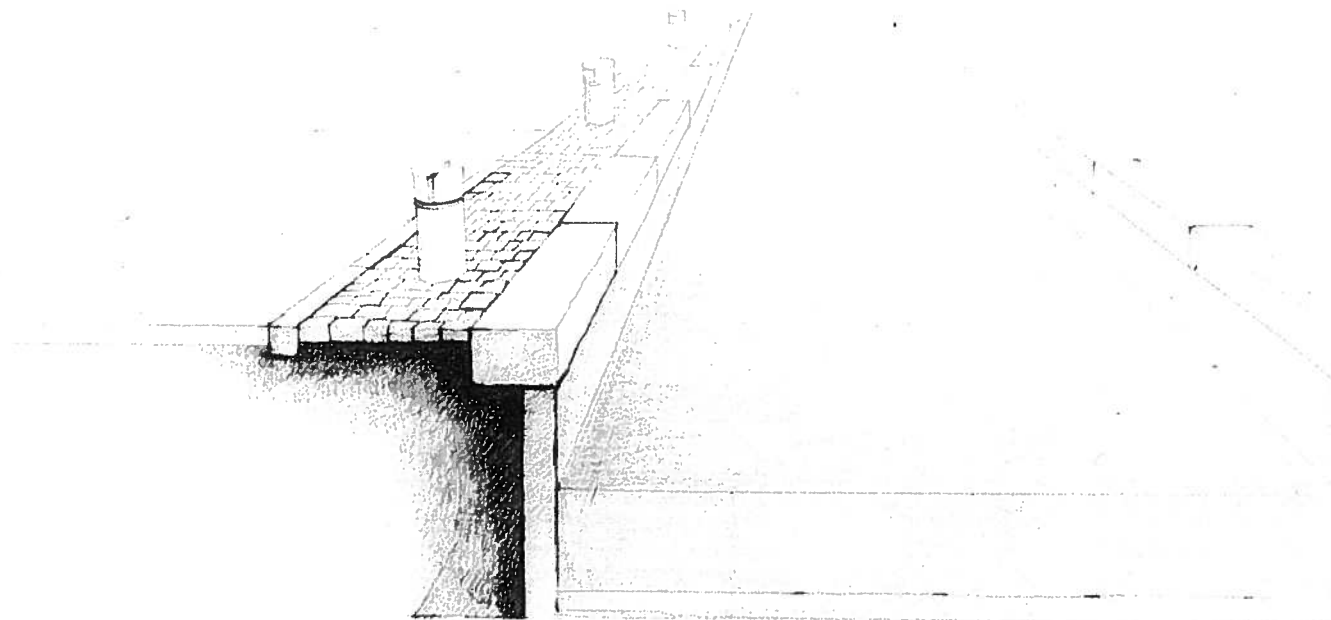
- * Establish as a primary goal the preservation of the surviving structures of Richmond's original canal system.
- * Use the canal corridor as the element that laces together the many points of historical interest; actively utilize this advantage to promote the canal as a major tourist and local attraction.
- * Restore and even reconstruct historical buildings, bridges, mills and other details along the canal route.
- * Use reconstructed period canal barges, packet boats, and bateaux to bring a romantic touch back to the canal. Use these craft for historic tours of the canal.
- * Reestablish a canal milepost system related to historical markers along the canal walk.
- * Integrate original canal stones salvaged from the Richmond Metropolitan Authority's construction of the Downtown Expressway into the construction of new locks.
- * Coordinate the canal's historical interpretive development with other related sites such as:
 - The 1607 landing of Captain Christopher Newport.

- The site of the first state capitol in the city.
 - The park proposed for the commemoration of Religious Freedom.
 - The Libby Prison and the City Dock.
 - The route of Abraham Lincoln's landing and walk through Richmond in April of 1865.
 - Early industrial sites such as the Tredegar Iron Works and the Virginia Manufactory of Arms.
 - Other points of interest.
- * Encourage the berthing of reconstructed tall ships, paddle wheelers, and a Civil War gun boat or ironclad at the City Dock. Invite the tall ships of other cities to visit Richmond.
 - * Document the original sections and structures. Research and interpret the canal's long history, coordinating with other canal parks. Establish a repository of historical documents, pictures, measured drawings, and oral histories. Establish a canal museum along the route. Broaden public awareness of the canal's importance to Richmond.



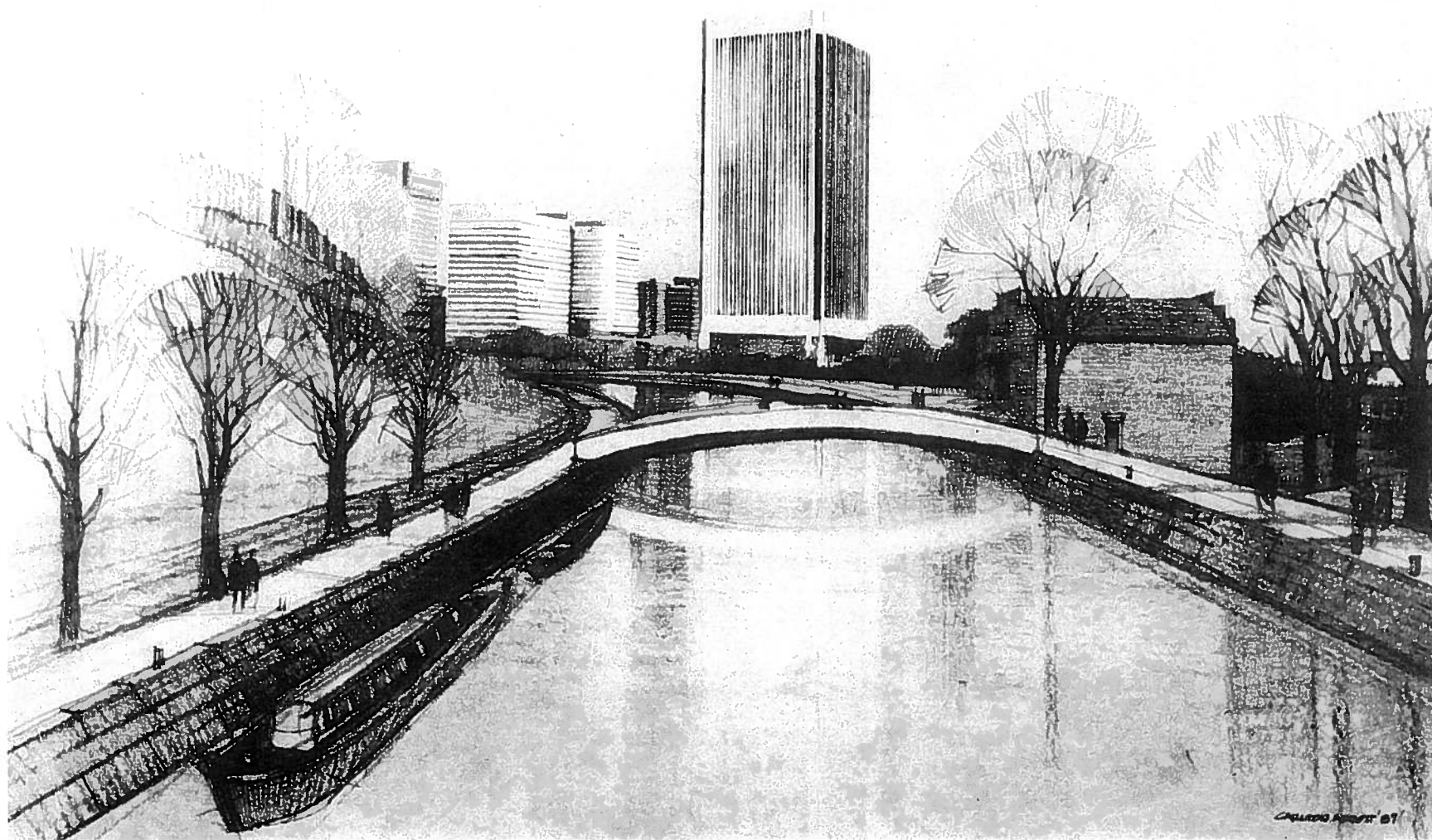
Carleton Arbon '88

This perspective drawing depicts the reconstruction of a possible alternate canal route near the restored original buildings of the old Tredegar Iron Works in Richmond.



CANTON ABBOTT 87

This detail illustrates the
new canal edges and pavements
to be made of original canal stones.



This drawing depicts the restoration of an original section of the James River and Kanawha Canal in the vicinity of the old Tredegar Iron Works. All of the buildings depicted are existing. The view is looking east with the Federal Reserve building in the center.

Pedestrian Routes Along the Canal

The canal environment is basically linear, and pedestrian trails along its edge will encounter many of the same obstacles as the canal will. The success of the canal as an urban environment will depend not only on the pedestrian linkages along the canals linear route, but also on the connection of the canal walkways to the established pedestrian fabric of the city.

Recommendations for the Canal Walks:

- * Eliminate obstacles and barriers to continuous pedestrian traffic.
- * Build pedestrian bridges over the canal at convenient locations. Design these bridges in historically based styles when possible. Bridges should have adequate clearance for passing canal boats. Bridges can add a picturesque character to the canal while providing the pedestrian with a dramatic view.
- * Provide attractive and comfortable walking surfaces. Utilize stone and traditional materials whenever possible.
- * Create interest along the walk.
- * Develop a walkway that is clean, attractively landscaped and well-lighted.
- * Develop artistic signage, benches, waste cans, telephone booths, light posts, fencing, and other site amenities in such a manner that their design contributes to the authentic character of the canal environment.
- * Relate the pedestrian walks carefully to the historical interpretation, signs and milepost systems.
- * Establish strong pedestrian connections to the new development of housing at Tobacco Row.

- * Connect the canal walks around the proposed new Shockoe Canal basin to the well established commercial areas of the Shockoe Slip and Cary Street.
- * Reinforce the existing "canal walk" connections from the Haxall Canal up Seventh Street to Byrd Street.
- * Link the canal with the Broad Street commercial area, possibly by trolley or other conveyance.
- * Develop guidelines for the landscaping of the canal. Considerations include types of trees, maintenance, characteristics of seasonal color, compatibility with streetlights, and tolerance to drought and disease.

Canal Boats

The use of canal boats will contribute to the life and spirit of the canal environment.

Recommendations:

- * Establish types of boats to be used on the canal, permitting private boating if possible. Investigate the management experience of other urban canal parks which operate canal boats such as:
 - Chesapeake and Ohio Canal National Historical Park along the Potomac in Maryland.
 - Paseo del Rio, San Antonio, Texas.
 - Lowell National Historical Park, Lowell, Mass.
 - Erie Canal in New York.
 - Canals in Ottawa, Ontario, Canada.
- * Develop shallow draft, self-propelled excursion boats for use in touring the canal.
- * Design canal channels, turning basins, locks and other canal structures to accommodate reconstructed canal freight boats that measure 93 feet long by 14 feet wide. The draft would be about two feet.
- * Reconstruct canal barges, canal packet boats and other period canal boats. Employ these boats for interpretive and tourist uses.
- * Provide adequate docking space for canal boats at turning basins.
- * Consider the overhead clearances of all structures over the canal so that they can accommodate canal boats.

Coordination of Canal with Floodwall Construction

Severe flooding of the James River into the Shockoe valley area in recent years has caused the City of Richmond and the U.S. Army Corps of Engineers to undertake the planning and engineering design of a wall to protect the lower elevations of the city. The wall on the north side of the river will start in the vicinity of the Reynolds Metals foil-manufacturing plant at 12th Street and will run generally eastward, barricading the river to 22nd Street. The wall will be constructed of cast-in-place reinforced concrete and approach 27 feet in height in some areas.

When completed, it will be the tallest floodwall to have been constructed in the United States by the U.S. Army Corps of Engineers. At some locations, the wall will be penetrated by streets and railway tracks. Those penetrations in the floodwall will have operating floodwall doors that will be closed and sealed as floodwaters rise.

The U.S. Army Corps of Engineers expects to have the engineering plans completed by the late spring of 1988. Advertisement for bids and the commencement of construction of the floodwall could easily begin in 1988. Accordingly, it is important that the proposed route of the canal be considered in the engineering design so that floodwall construction does not obstruct the opportunity for future canal development.

Recommendations:

- * Determine the actual location of the proposed penetration of the canal through the floodwalls at the west end of the Richmond Dock in the vicinity of 17th Street and at 12th Street.
- * Construct the 17th Street floodwall door for the canal to be sufficient to accommodate the height, width and draft of a restored canal boat 14 feet wide x 93 feet long. Coordinate the exact placement of the canal door with the nearby footings and piers of expressway and railroad bridges to provide a direct and linear approach to the floodwall door for the long boats.

Provide a pedestrian door adjacent to the canal door to allow for the continuation of a canal walk and access to the Richmond Dock.

- * Integrate the proposed canal with secondary floodwall construction. For example, the floodwall design will necessitate the construction of new storm water catch basins and storm sewer lines that will service the inland side of the floodwall. These proposed storm sewer locations will be in conflict with the proposed canal route, but can be skillfully integrated.
- * Integrate the proposed canal with secondary elements necessitated by the construction of the floodwall. Relocated streets, newly required service ways, new storm sewers, catch basins, and relocated utilities all need to be coordinated.
- * Avoid the construction of new service bridges over the canal.
- * Coordinate the canal routes with the possible engineering impact of Richmond's combined sewer overflow project.

Canal Water Quality and Management

The new canal system must establish and maintain a high level of water quality.

Recommendations:

- * Engineer proper water flow in the canal, particularly in droughts and floods, and coordinate overall water use with other water resource needs, such as requirements for proposed fish ladder operations and recreational activities in the river.
- * Construct canal water supplies and canal water piping to dead water sections of the canal to insure that all segments of the new canal are consistently flushed.
- * Identify areas of the canal that are subject to bottom siltation and undertake corrective maintenance.
- * Enforce strict anti-litter policies and work toward a consistently clean canal system, enlisting volunteers to help. Actively monitor water quality.
- * Prohibit storm water and industrial discharges into the canal as much as possible.

Cost Estimate

Phase I Construction on Richmond Dock to Virginia Street:

Remove existing steel flume gates.....	\$ 2,500.00
Demolition of existing flume wall.....	\$ 10,000.00
Excavate for new canal.....	\$ 100,000.00
Reconstruct top of arched sewer where new canal passes over.....	\$ 100,000.00
Reconstruct top of box sewer.....	\$ 15,000.00
Relocation or modification of underground utilities.....	\$ 150,000.00
Demolition of existing buildings.....	\$ 65,000.00
Construct new right turn ramp for the northbound lane of 14th Street.....	\$ 30,000.00
Construct 16' span bridge over the canal for vehicular and pedestrian use.....	\$ 750,000.00
Remove reinforced concrete deck that currently encloses the original canal under Southern Railway building...	\$ 50,000.00
Demolish south end of the Southern Railway building.....	\$ 15,000.00
Restore south end of the Southern Railway building.....	\$ 20,000.00
Remodel Virginia Street bridge.....	\$ 100,000.00
Dredge existing canal.....	\$ 40,000.00
Build a water source to be used to flush out the Shockoe basin docking area (could be expressed as a fountain).....	\$ 100,000.00
Construction of new canal walls.....	\$ 475,414.00
Construction of new walkways.....	\$ 137,500.00
Aesthetic improvements, landscaping, site furniture.....	\$ 300,000.00
Construction of new docking area.....	\$ 125,000.00
Restore existing walls of old canal.....	\$ 100,000.00
<hr/>	
Subtotal.....	\$2,685,414.00
25% Contractors overhead and profit.....	\$ 671,354.00
Subtotal.....	\$3,356,768.00
10% Contingency.....	\$ 335,677.00
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Total Project Cost for Phase I.....	\$3,692,445.00

Cost Estimate for All Phases

Proposed New Canal Construction:

Richmond Dock Development (future work).....	\$ 1,000,000.00
Richmond Dock to Virginia Street (Phase I).....	\$ 3,692,445.00
Virginia Street to the Haxall Canal (future work).....	\$ 1,337,000.00
Haxall Canal (future work).....	\$ 2,090,000.00
<u>Haxall Canal to Tredegar Iron Works (future work).....</u>	<u>\$ 2,273,500.00</u>
Subtotal.....	\$10,392,945.00
<u>Contractors overhead and profit at 25%.....</u>	<u>\$ 2,598,236.00</u>
Subtotal.....	\$12,991,181.00
<u>10% Contingency.....</u>	<u>\$ 1,299,118.00</u>
Total Project Cost.....	\$14,290,299.00

*All cost estimates are based on schematic engineering data. Subsurface investigation of utilities and other obstacles will be necessary for a clearer definition of actual costs.

Industrial Development Authority

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Nikki P. Nicholau
Colston A. Lewis, Esq.
M. A. Motley
Sanford Groves, Sec., Treas.

Historic Richmond Foundation Canal Committee

A. Howe Todd, Chairman
S. Douglas Fleet
Sidney J. Gunst, Jr.
Paul A. Murphy
John W. Pearsall, III
Dale Wiley, Jr.

Advisors

John G. Zehmer, Jr.
William E. Trout, Jr.
Charles T. Peters, Jr.
Don Charles

Credits

Personnel of Carlton Abbott and Partners who were a part of the Design Team:

Carlton S. Abbott, FAIA, architect/planner
W. Douglas Mettler, ASLA, landscape architect
Karen A. Heller, landscape architect
David M. Stemann, graphic maps
Frederick K. Robertson, graphic maps

Valentine Museum, historic photographs of canal
Virginia Reproduction and Supply, maps
Multi-Print, Inc., photographic printing
Dementi Foster Studios, photographic reproduction of renderings
Charles Dunn, Floodwall Coordinator for the City of Richmond
Jeffrey Irving, U.S. Army Corps of Engineers, Fort Norfolk
Department of Public Works, City of Richmond
Department of Recreation and Parks, City of Richmond