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LEON S. AVAKIAN, INC. *Consulting Engineers*

788 WAYSIDE ROAD • NEPTUNE, NEW JERSEY 07753

March 18, 2008

Dr. Michael Brantley, Chairman
Wesley Lake Commission
25 Neptune Boulevard
Neptune, New Jersey 07753

Re: Wesley Lake Rehabilitation Plan
Wesley Lake Commission
Township of Neptune & City of Asbury Park
Monmouth County, New Jersey

Dear Dr. Brantley:

After many months of planning and development, our office is pleased to present to the Wesley Lake Commission a Wesley Lake Rehabilitation Plan document, for review and distribution to Commission members and municipal representatives.

This Rehabilitation Plan document includes an analysis, narrative description, project mapping and cost estimate for each of the four proposed components of construction and restoration, listed below:

- ★ Lake Dredging
- ★ Stormwater Management
- ★ Wall Rehabilitation
- ★ Streetscape Improvements

The cost estimate provided for each component of construction and restoration includes estimated engineering costs for design, permitting, inspection and contract administration, and a separate construction cost estimate for development or rehabilitation.

These costs are broken down into a construction cost table, provided as an attachment to this cover letter. The total project cost of $ 12,000,000., includes all estimated costs for each component of construction and restoration, inclusive of concept, design, bidding, construction, restoration, inspection and contract administration. While this is an excessively high amount, it is representative of the nature of Wesley Lake, with massive structural retaining walls, a 750 acre urban watershed area, and degradation due to years of neglect.

Also provided as attachments to the plan document are four appendices representing a History of Wesley Lake, Pedestrian Bridge Evaluation, Structural Wall Survey and Stormwater Management Manufacturer's Literature. This information will assist in providing the reader with a scope of the magnitude of the rehabilitation project being undertaken by the Commission.

We are hopeful that this Rehabilitation Plan will be met with a renewed vigor to pursue funding sources and establish project timelines, in an effort to improve the environmental quality and recreational function of this once beautiful and vital natural resource.

Specific thanks are made to Asbury Park City Engineer Brian St. C. Grant, PE, and former Neptune Township Director of Engineering and Planning Richard Gardella, PE, for their evaluation and professional expertise that added to the completion of this document.

Please review this document, and advise our office as to how you would like to present it to our municipal, county and State officials, to form a project partnership for restoration of this beautiful natural resource of the Jersey Shore.

Sincerely,

LEON S. AVAKIAN, INC.

Peter R. Avakian, PE
Commission Engineer

Encl.

Cc: Commission Members

Wesley Lake Rehabilitation Plan Cost Analysis

Scope	Engineering Design Permits & Inspection	Constr
g	$60,000 (plus soil analysis & permitting costs)	$2,000
ater Management	$55,000	$1,470
habilitation	$350,000	$6,670
cape	$100,000	$1,175
	$565,000	$11,31
		$11,88
	Total Estimated Project Cost	$12,00

Wesley Lake Improvement Project

Restoration of Wesley Lake and Watershed Area

Lake Dredging

Including evaluation of regulatory requirements and costs necessary for the implementation of a lake dredging project, including access, removal and disposal of sediment.

WESLEY LAKE COMMISSION
CITY OF ASBURY PARK
TOWNSHIP OF NEPTUNE

Peter R. Avakian, PE, PLS, PP

March 2008

PROPOSED DREDGING PLAN

Dredging Plan – work will involve the development of a dredging plan and identification of soil characteristics through sediment sampling, for the entire area of Wesley Lake. This work will include submission of an application to NJDEP for a dredging permit, and will identify limits and parameters required for compliance with permit regulations.

Westerly Volume – The dredging map for the westerly section of the lake has been completed, and sediment volumes have been calculated for this area. The volume of sediment calculated for the westerly third of the lake, in the area identified above, is approximately 12,500 cubic yards of material. This translates to an estimated removal and disposal cost of approximately $312,500, based upon a unit cost of $25 per cubic yard.

A soil sample has been taken and submitted to the testing lab, for physical and chemical sediment analysis. We will provide results upon receipt.

An evaluation of the remainder of the lake yields the following preliminary volume calculations and corresponding cost estimates:

Center Volume – dredging to a depth of 3 feet below the existing lake bottom will require removal of approximately 27,500 cubic yards of material. This translates to a disposal cost of approximately $687,500, based upon a unit cost of $25 per cubic yard.

Easterly Volume – dredging to a depth of 2 feet below the existing lake bottom will require removal of approximately 25,000 cubic yards of material. After review with the Asbury Park City Engineer, the depth of dredging was increased in this area, to accommodate wall reconstruction imbedment depth. This will require removal of an additional 15,000 cubic yards of material. This translates to a disposal cost of approximately $1,000,000, based upon a unit cost of $25 per cubic yard.

LAKE DREDGING REGULATORY REQUIREMENTS

A New Jersey Department of Environmental Protection General Permit 13 (GP #13) authorizes dredging in freshwater wetlands necessary to restore or maintain a lake to its original bottom contours. For areas greater than one acre, an individual permit application submission is required.

If the lake water elevation is to be lowered during dredging, the permittee must obtain a lake lowering permit from the NJDEP Division of Fish and Wildlife. The permittee may temporarily disturb wetlands or State open waters beyond those disturbed directly by the dredging, in order to obtain vehicular access for the dredging (limited to ⅛ acre). All disturbances must be restored to their pre-existing elevation and condition upon completion of dredging. NJDEP may require testing of dredged material if there is reason to suspect that the material is contaminated.

PRELIMINARY EVALUATION COST ESTIMATE

At this time, in order to proceed with the development of a lake dredging permit application submission, it is requested that the following items receive funding, from the Wesley Lake Commission or jointly from the City of Asbury Park and the Township of Neptune:

· Physical & Chemical Sediment Testing	$ 2,500.
· Completion of Bathymetric Survey of Lake	$ 2,500.
TOTAL AMOUNT OF PRELIMINARY FUNDING	$ 5,000.

Submission Requirements for GP #13 application:

- LURP application form
- Public Notices
- USGS Quadrangle Maps
- Original Color Photographs
- Compliance Statement
- Wetlands Evaluation and LOI (letter of interpretation)
- Five copies of a site plan sealed by a licensed land surveyor
- A copy of past NJDEP approvals for the site
- Documentation that the dredging will not exceed original bottom contour
- Mapping of upstream land areas discharging to the lake, including sources of sediment discharge and percentage of impervious cover.

PERMIT PREPARATION AND SUBMISSION COST ESTIMATE

In order to prepare and submit the necessary NJDEP permit application package to obtain authorization to dredge all or a portion of Wesley Lake, funding will be required to complete the following activities:

- Wetlands evaluation and LOI
- Completion of submission requirements
- Mapping Requirements
- Public Notices & Application Fee

ESTIMATED COST OF APPLICATION SUBMISSION $15,000.

Please note that additional sediment testing and analysis may be required by NJDEP, which would have to be undertaken and the time of application submission. These costs are not provided at this time. They will be determined based, in part, on the extent of dredging proposed to be undertaken. If ten (10) analytical samples are required by NJDEP, and are evaluated for the pp40 criteria, than an estimated cost of $1,250 per test, or a total additional cost of $12,500 can be anticipated.

PROPOSED LAKE DREDGING COST ESTIMATE

Engineering Design and Bidding Costs

Completion of bathymetric survey and dredging plan for entire lake

Preliminary Cost Estimate = $ 17,500.

NJDEP Permit Application Costs

Application preparation cost plus application fee

Preliminary Cost Estimate = $ 15,000.

Cost does not include soil analysis or NJDEP permit fee

Estimated Construction Costs

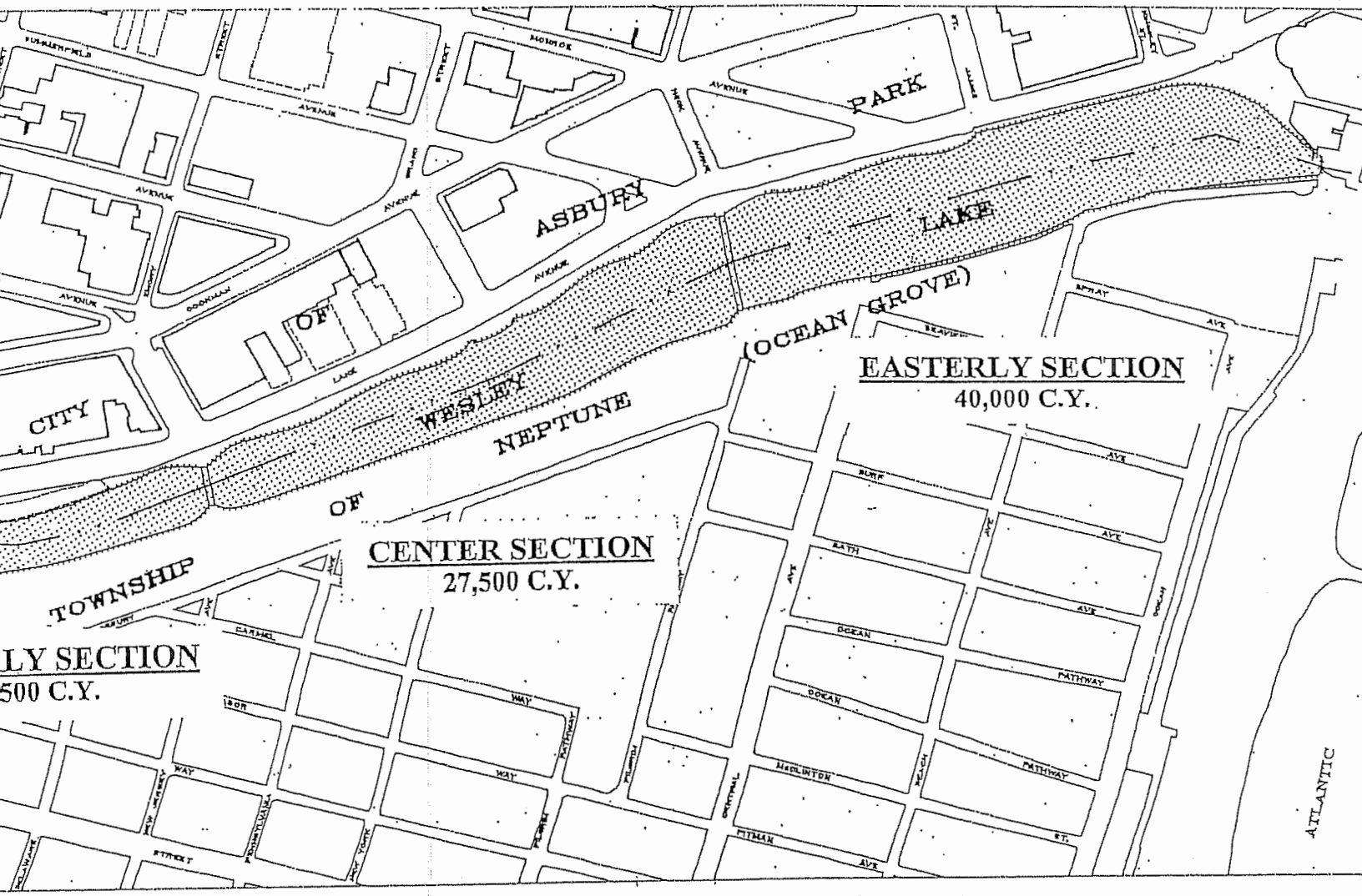
Estimated dredging volume of 80,000 cu. yd. @ $25 per cubic yard

Preliminary Cost Estimate = $ 2,000,000

Contract Administration and Inspection Costs

Estimated at percentage of construction cost

Preliminary Cost Estimate = $27,500



WESLEY LAKE DREDGING PLAN

Wesley Lake Improvement Project

Restoration of Wesley Lake and Watershed Area

Stormwater Management

Develop an overall stormwater management plan for the Wesley Lake watershed. Plan will include the evaluation of existing infrastructure, subwatershed areas, and installation of manufactured treatment devices (MTD's) to control pollutant runoff.

WESLEY LAKE COMMISSION
CITY OF ASBURY PARK
TOWNSHIP OF NEPTUNE

Peter R. Avakian, PE, PLS, PP

March 2008

PROPOSED STORMWATER MANAGEMENT PLAN

Stormwater Management Plan – The Wesley Lake Commission recognizes that a need exists to meet recently adopted Stormwater Management Regulations within the entire 750 acre watershed of Wesley Lake. This includes all roadway areas in the vicinity of Wesley Lake, bordering Ocean Grove in the Township of Neptune on the south, and the City of Asbury Park on the north. The principal purpose of stormwater management in an urban lake environment is to minimize hydrocarbon runoff entering the Lake waters, minimize silt/sediment entering the lake and accumulating in the lake bottom, and elimination of floatables from entering Wesley Lake from the watershed, via the storm drainage system.

The goals established for the Wesley Lake stormwater management plan will incorporate goals included in the adjacent municipal stormwater management plans, which include the following:

- Reduce flood damage to life and property
- Minimize increase in stormwater runoff from new development
- Reduce soil erosion from development and construction projects
- Assure adequacy of culvert and bridge structures
- Maintain groundwater recharge
- Prevent an increase in nonpoint source pollution
- Maintain integrity of stream channels for biological function
- Minimize pollutants in stormwater runoff
- Protect public safety through proper stormwater basin design

These amendments to current pollutant discharge rules were made in response to regulatory changes published by the US Environmental Protection Agency as a section of the Federal Clean Water Act on December 8, 1999.

An overall stormwater management plan will be developed for the Wesley Lake watershed. This will include recommendations of installation of manufactured treatment devices (MTD's), within sub watershed areas, for removal of floatable material, sediments and suspended solids, and petroleum products. Manufacturer's literature relating to manufactured treatment devices is provided in Appendix D.

The plan will be supplemented with recommended locations of MTD's. This will include those installed through capital improvement project, funding grant applications, and developer's agreements (ref. West Lake Avenue Redevelopment, Neptune).

Design Considerations

Evaluation of existing infrastructure improvements will be made, with the intent to address infill developments which do not currently meet regulatory standards.

Two specific areas within the Wesley Lake watershed that require stormwater management control are identified below:

- Route 33 Roadway Improvement Project, recently completed by the New Jersey Department of Transportation. This project included much needed roadway improvements, and provided storm drainage system improvements. No stormwater management facilities were included in the design, which allows surface runoff from paved and impervious surfaces to discharge directly into Wesley Lake.

- West Grove Square Site Development - Construction included installation of an underground stormwater retention piping system, and above ground chamber and detention basin. No stormwater recharge or sediment removal facilities were included in the design, which allows surface runoff from paved and impervious surfaces to discharge directly into Wesley Lake.

Existing Stormwater Management Facility Improvements

The following areas of the Wesley Lake watershed contain existing stormwater management facilities, installed to promote sediment removal from stormwater flows, prior to discharge into Wesley Lake:

- Ocean Grove Beachfront, Neptune – Stormceptor unit installed by US Army Corps of Engineers as part of the beach nourishment plan. Located adjacent to spillway structure in Ocean Grove.

- Waterfront Redevelopment, Asbury Park – Baysaver units installed at point of discharge of redevelopment zone into Wesley Lake.

- West Lake Avenue Redevelopment, Neptune – Treatment devices proposed to be installed in Wesley Lake watershed, as a condition of developers agreement by Neptune Township.

PROPOSED STORMWATER MANAGEMENT COST ESTIMATE

Engineering Design and Bidding Costs

Work will include the completion of construction plans and specifications, and analysis of the hydraulic flows through each subwatershed. This analysis will include the determination of size and function of each Manufactured Treatment Device (MTD).

Preliminary Cost Estimate = $ 27,500.

Estimated Construction Costs

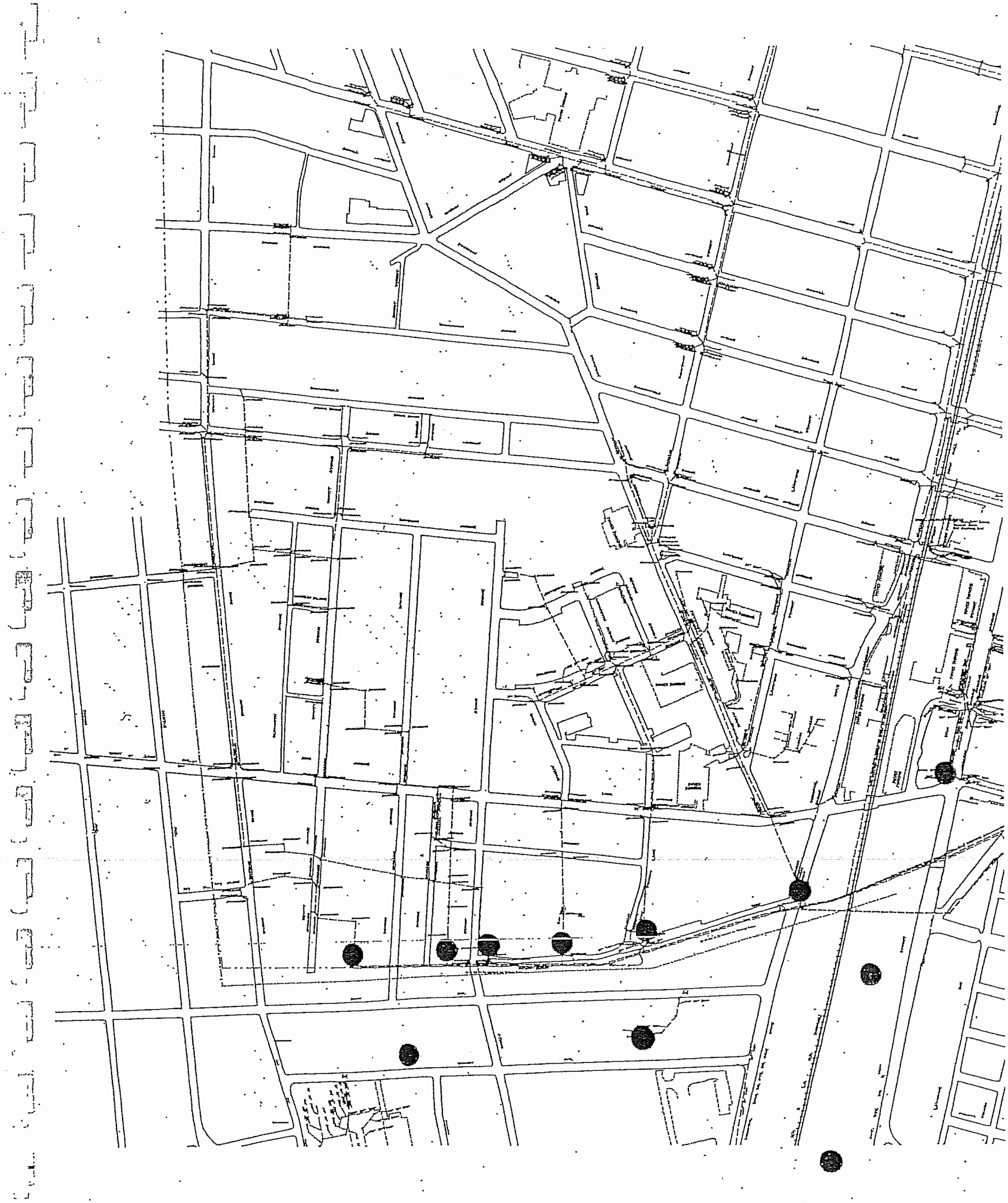
The watershed area map will be updated, and a cost estimate developed for installation of MTD's as follows:

Asbury Park Watershed	8 units @ $ 85,000 ea. =	$ 680,000.
Neptune Watershed	4 units @ $85,000 ea. =	$ 340,000.
Ocean Grove Fire Lanes	10 units @ $45,000 ea. =	$ 450,000.
	Budgetary Construction Cost Estimate =	$1,470,000.

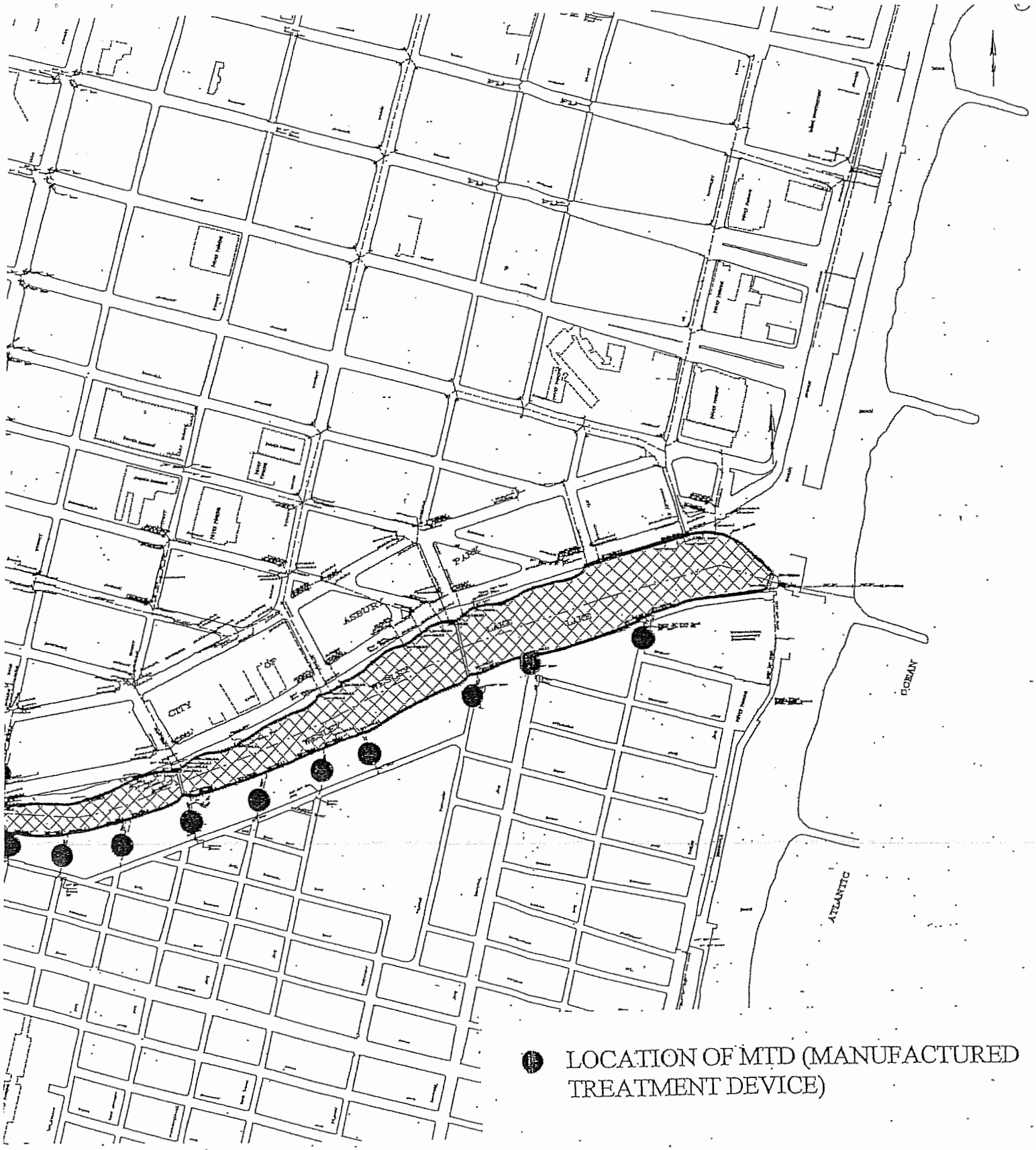
Contract Administration and Inspection Costs

Estimated at percentage of construction cost.

Preliminary Cost Estimate = $27,500



WESLEY LAKE STORM



● LOCATION OF MTD (MANUFACTURED TREATMENT DEVICE)

TER MANAGEMENT PLAN

Wesley Lake Improvement Project

Restoration of Wesley Lake and Watershed Area

Wall Rehabilitation

Project will include an evaluation of existing areas of wall restoration through waterfront development projects. Evaluate existing structural evaluation reports and cost estimates. Develop a recommended overall wall rehabilitation plan for Neptune (Ocean Grove) and Asbury Park shoreline restoration

WESLEY LAKE COMMISSION
CITY OF ASBURY PARK
TOWNSHIP OF NEPTUNE

Peter R. Avakian, PE, PLS, PP

March 2008

PROPOSED WALL RESTORATION PLAN

Bulkhead / Retaining Wall Restoration

Our office will evaluate a report prepared by the Neptune Township Engineer for the Ocean Grove wall, (a copy of which is provided as Appendix C) and enhance the area to include Asbury Park wall restoration.

Plan drawings and cost estimates will be prepared to reflect wall restoration around entire lake perimeter, and associated costs, including those areas of developer contribution. Wall areas have been evaluated, and plans for proposed wall restoration should be obtained to encourage compliance between various sections and components of proposed rehabilitation.

A meeting has been held with Engineers from both the City of Asbury Park and Township of Neptune, to coordinate the following issues and information:

- ★ Location of Developer Funded Wall Restoration
- ★ Review Design Details and Evaluation of Estimated Construction Cost
- ★ Determine Municipal Component of Wall Restoration
- ★ Calculate Cost Estimate for Remaining Wall Restoration

The project scope of work and estimate of construction cost are provided as a part of this rehabilitation plan document. Construction details will be established by either waterfront developers, for review and approval by the Wesley Lake Commission, or directly by the Wesley Lake Commission, dependant upon the availability of funding sources.

PROPOSED WALL REHABILITATION COST ESTIMATE

Geotechnical and Structural Engineering Design and Analysis

Wall rehabilitation analysis, soil borings and subgrade analysis, foundation and footing design, evaluation of alternative wall materials, and preparation of construction details for entire lake perimeter, including precast concrete, poured in place concrete, composite material, vinyl, and steel sheathing section analysis.

Preliminary Cost Estimate = $ 85,000.

NJDEP Permit Application Costs

Application preparation cost plus application fee necessary to receive waterfront development permit and stream encroachment permit, required by NJDEP to proceed with the wall rehabilitation and reconstruction. Work will include preparation of a coastal zone management compliance report, as required as a condition of permit approval.

Preliminary Cost Estimate = $ 75,000.

Engineering Design and Bidding Costs

Work will include preparation of a complete set of construction plan drawings of the wall perimeter for entire lake. Drawings will include wall construction details, footing details, structural support and anchoring design details, and complete site restoration.

Preliminary Cost Estimate = $ 90,000.

Estimated Construction Costs

Asbury Park Steel Wall Rehabilitation

Recreate steel section and drive new steel sheathing in front of existing deteriorated steel. Work will include providing tie backs and structural connections, finished capping over top of exposed steel, reconstruction of storm drainage pipe discharge pipes, as required, and site restoration.

Total length from The Boulevard to the easterly end of the spillway = 3300 lf.

Preliminary Cost Estimate = $ 2,805,000

Ocean Grove Steel Wall Rehabilitation

Recreate steel section and drive new steel sheathing in front of existing deteriorated steel. Work will include providing tie backs and structural connections, finished capping over top of exposed steel, reconstruction of storm drainage pipe discharge pipes, as required, and site restoration.

Total length from The Boulevard east to the Founders Park = 1900 lf.

Preliminary Cost Estimate = $ 1,615,000

Ocean Grove Concrete Wall Rehabilitation

Construct new concrete precast or poured in place concrete retaining wall in front of existing deteriorated concrete wall. Work will include providing tie backs and structural connections, finished capping over top of exposed concrete, reconstruction of storm drainage pipe discharge pipes, as required, and site restoration.

Total length from Founders Park to the easterly end of the spillway = 1500 lf. @ 1500 $/LF

Preliminary Cost Estimate = $ 2,250,000

Contract Administration and Inspection Costs

Work will include site inspection of construction, to insure installation of improvements in accordance with approved design plans, and contract administration, recommending payment to contractor(s) in accordance with approved construction.

Preliminary Cost Estimate = $100,000

Redevelopment Area Improvements

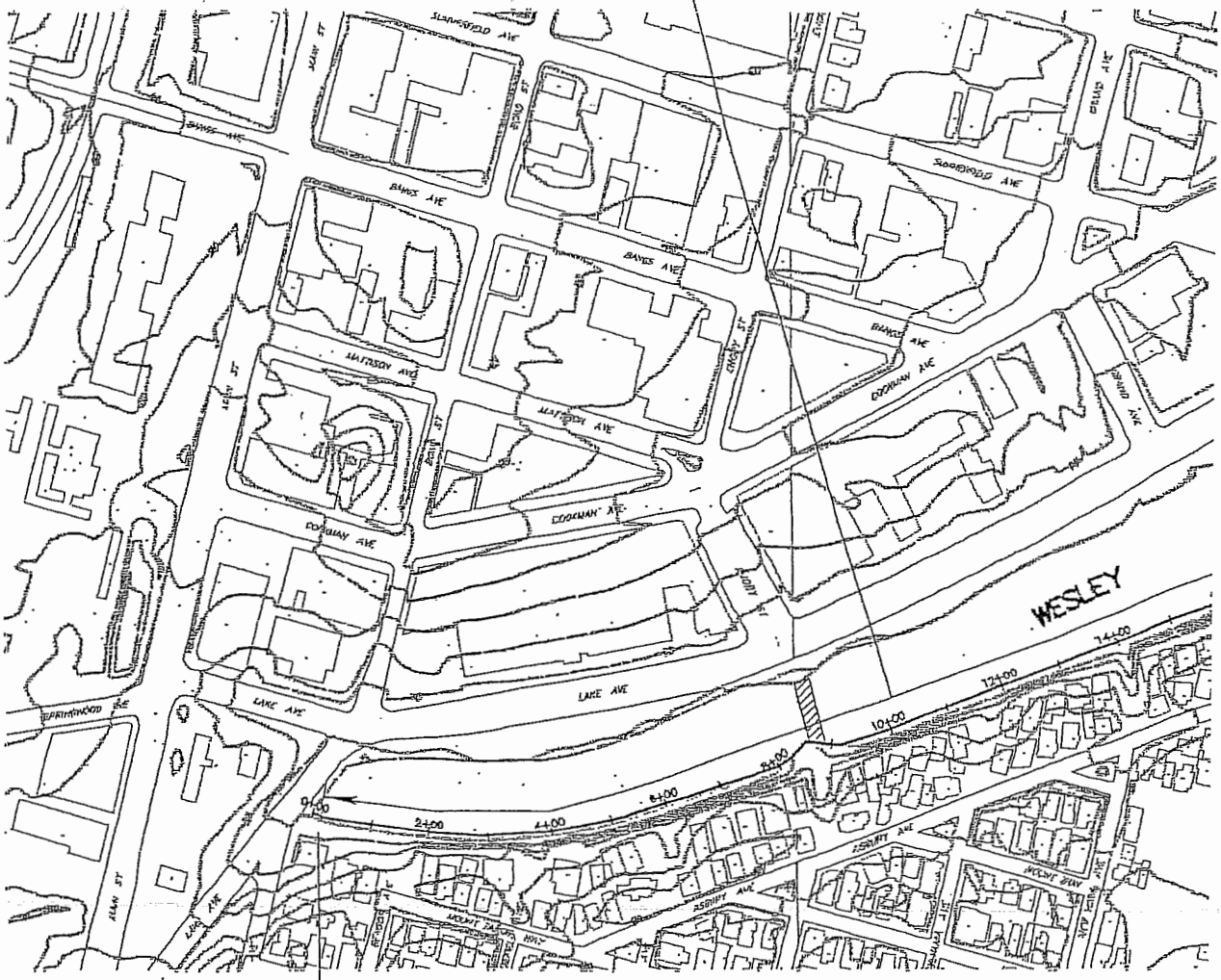
Evaluate areas of waterfront redevelopment in both Asbury Park and the Ocean Grove section of Neptune Township. Upon availability, include limits of improvements and funding contributions from waterfront developers in overall project cost estimate.

STATION 22+30 TO 23+30
NEWER PRECAST CONCRETE BULKHEAD

STATION 21+15 TO 22+30
OLD CONCRETE GRAVITY WALL
PRIORITY 6
- Some cracking and spalling
- Wall appears stable
- Minimal movement

STATION 0+00 TO 19+00.
STEEL SHEETING BULKHEAD
PRIORITY 7
- Aged, Rusting
- Extensive deterioration and large holes at water line
- Poor structural condition
- No signs of excessive movement

STATION 19+00 TO 21+15
OLD CONCRETE GRAVITY WALL
PRIORITY 5
- Excessive wall cracking and spalling
- Some wall movement



1,900 L.F. STEEL SHEETING WALL – 3 FT.± EXPOSED HEIGHT

$350/FT. REPLACEMENT COST = $665,000

STRUCTURAL

SCA

Job No.
200007400007

Scale: (H)1" = 300'±
(V)N.A.

Drawn
D.A.R.

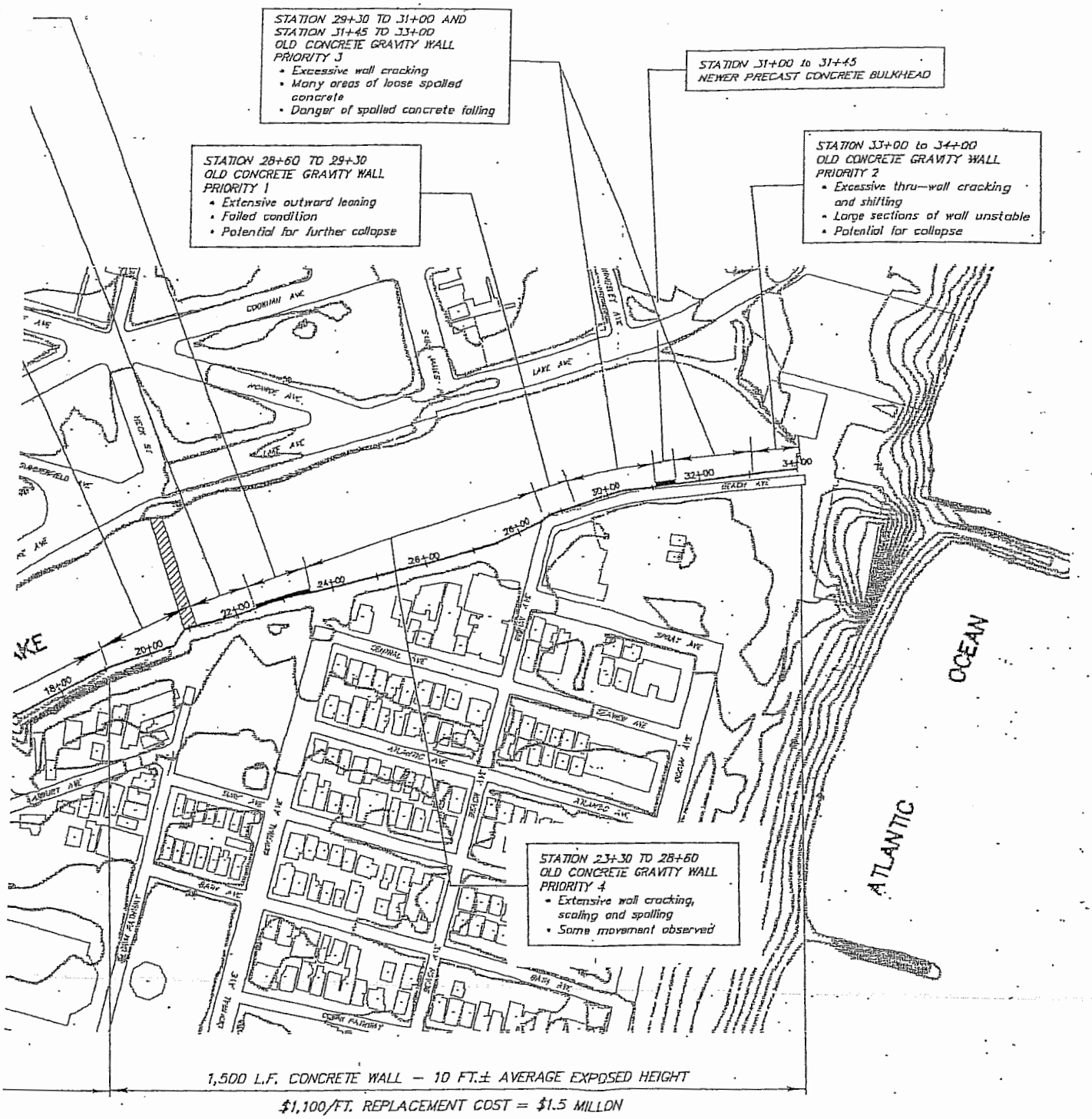
Designed
R.C.M.

SHEET No.
1
OF 1

STRUCTURAL WALL SURVEY
WESLEY LAKE – SOUTH SHORELINE
PROPOSED DRAINAGE IMPROVEMENTS
2003 DRAINAGE PROGRAM
TOWNSHIP OF NEPTUNE, MONMOUTH COUNTY, NEW

BEI Drawing Path:
P:\Jobs\200007400007\Dwg\STRUCT-SURVEY.dwg

Plotted: 10/17/03 – 10:16 AM, By: DENNIS
File: P:\Jobs\200007400007\Dwg\STRUCT-SURVEY.dwg, ----> 11x17 STRUCT-SURVEY-300



1,500 L.F. CONCRETE WALL – 10 FT.± AVERAGE EXPOSED HEIGHT

$1,100/FT. REPLACEMENT COST = $1.5 MILLON

L SURVEY MAP

= 300'±

No.	REVISION	DATE	BY

DATE:

RICHARD C. MALONEY, P.E.
PROFESSIONAL ENGINEER
N.J. Lic. No. 39023

SEY

BIRDSALL ENGINEERING, INC.
CONSULTING & ENVIRONMENTAL ENGINEERS
611 INDUSTRIAL WAY WEST - EATONTOWN - NJ - 07724
P - 732.380.1700 WWW.BIRDSALL.COM F - 732.380.1701
CERTIFICATE OF AUTHORIZATION No. 24GA27989800

Wesley Lake Improvement Project

Restoration of Wesley Lake and Watershed Area

Streetscape Plan

Development of construction details and material specifications to provide lakeside streetscape improvements, to insure a unified plan between waterfront development projects, central business district improvements, and residential properties surrounding the main body of Wesley Lake.

WESLEY LAKE COMMISSION
CITY OF ASBURY PARK
TOWNSHIP OF NEPTUNE

Peter R. Avakian, PE, PLS, PP

March 2008

PROPOSED STREETSCAPE PLAN

Streetscape Plan Design Details

Our office will evaluate existing waterfront development plans and details, to insure compliance with both Asbury Park waterfront redevelopment plans and Neptune Township redevelopment plans for a section of Ocean Grove known as the North End Hotel site.

The evaluation will include a recommendation of unified or complementary plan details and material specifications between waterfront development projects (in both Asbury Park and Ocean Grove), central business district improvements (in Asbury Park) and residential properties (in both Asbury Park and Ocean Grove).

Proposed lakeside streetscape improvement will include, but will not be limited, to the following construction items:

- Main Gateways and Pedestrian Bridge Entryways
- Pedestrian Walkways
- Fire Lane Access Walkways
- Perimeter Lighting
- Perimeter Railing
- Landscaping and Pocket Gardens

It is recommended that a set of design guidelines is prepared, to insure that any developer, contractor, property owner or homeowner will have access to recommended plan details and material specifications for each of the identified construction items.

Construction details will be established by either waterfront developers, for review and approval by the Wesley Lake Commission, or directly by the Wesley Lake Commission, dependant upon the availability of funding sources.

PROPOSED STREETSCAPE IMPROVEMENT COST ESTIMATE

Engineering Design and Bidding Costs

Work will include preparation of a complete set of construction plan drawings of the wall perimeter for entire lake. Drawings will include construction details, footing details, structural support and anchoring design details, and complete site restoration.

Preliminary Cost Estimate = $ 50,000.

Estimated Construction Costs

- **Main Gateways and Pedestrian Bridge Entryways**

  Work will include construction of pedestrian bridge entryway improvements, including handicapped access ramps, pedestrian stairways, decorative masonry walls, and architectural design elements.

  Preliminary Cost Estimate = $ 125,000

- **Pedestrian Walkways**

  Work will include construction of concrete pedestrian walkway improvements, including handicapped access ramps, replacing existing walks along the Ocean Grove residential properties, and replacing existing walks along the Asbury Park pedestrian access side.

  Preliminary Cost Estimate = $ 200,000.

- **Fire Lane Access Walkways**

  Work will include construction of concrete pedestrian walkway improvements, including handicapped access ramps, through existing fire lanes along (and between) the Ocean Grove residential properties.

  Preliminary Cost Estimate = $ 25,000.

- **Perimeter Lighting**

  Work will include construction of pedestrian lights along the entire perimeter of the Lake body. Estimated spacing is one lamp every 100 linear feet, with additional lighting fixtures adjacent to pedestrian bridge entryways. Including electrical conduit and new electrical service connections and meter boxes.

  Preliminary Cost Estimate = $ 330,000.

- **Perimeter Railing**

  Work will include construction of pedestrian railings along the entire perimeter of the Lake body. It is intended that railings will be installed on top of, or immediately adjacent to, newly constructed wall areas.

  Preliminary Cost Estimate = $ 430,000.

- **Landscaping and Pocket Gardens**

  Work will include installation of decorative plantings and pocket gardens, where space permits, along the entire perimeter of the Lake body, for aesthetic enhancement of structural improvements.

  Preliminary Cost Estimate = $ 65,000.

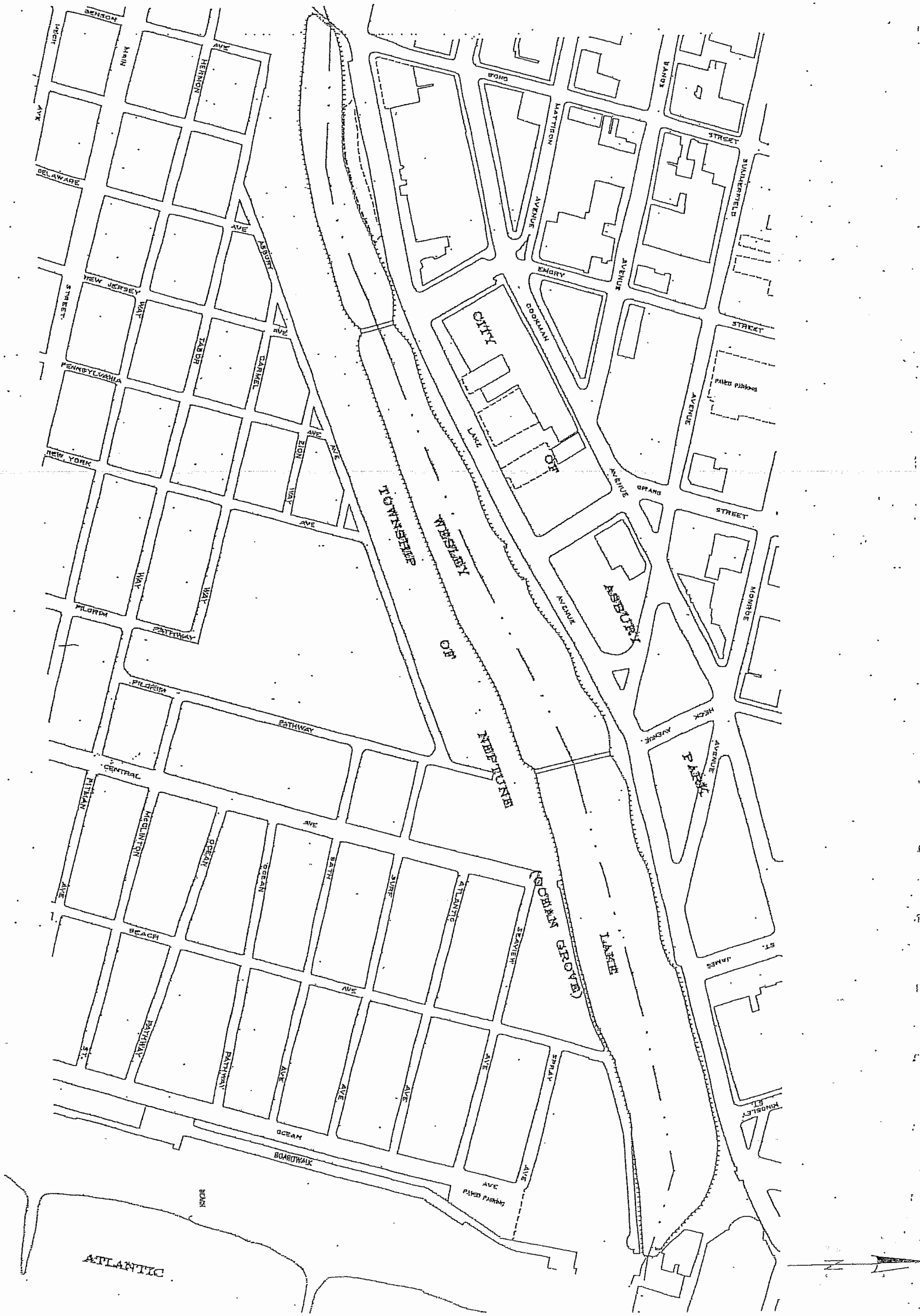
Contract Administration and Inspection Costs

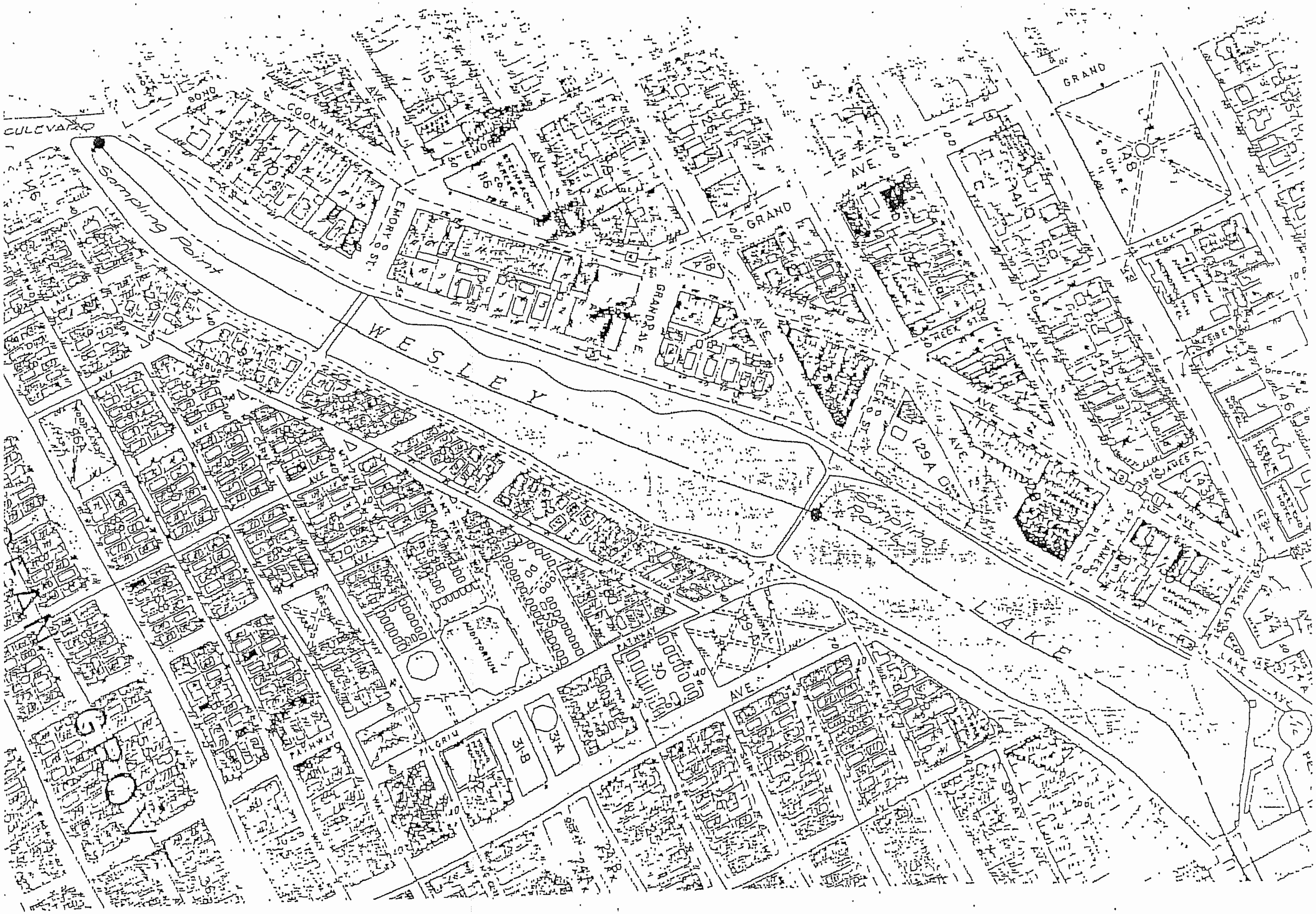
Work will include site inspection of construction, to insure installation of improvements in accordance with approved design plans, and contract administration, recommending payment to contractor(s) in accordance with approved construction.

Preliminary Cost Estimate = $50,000

Redevelopment Area Improvements

Evaluate areas of waterfront redevelopment in both Asbury Park and the Ocean Grove section of Neptune Township. Upon availability, include limits of improvements and funding contributions from waterfront developers in overall project cost estimate.


CITY OF ASBURY PARK
TOWNSHIP OF NEPTUNE
WESLEY LAKE
OCEAN GROVE
ATLANTIC
BENSON
MAIN
HECK
HERMON
AVE
DELAWARE
ASBURY AVE
NEW JERSEY
STREET
TABOR
CARMEL
PENNSYLVANIA
NEW YORK
ZION
WAY
PILGRIM
PATHWAY
CENTRAL
PITMAN
McCLINTOCK
OCEAN
BATH
SURF
ATLANTIC
SEAVIEW
BEACH
SPRAY
ST.
OCEAN
BOARDWALK
PAVED PARKING
BEACH
BOND
MATTISON
AVENUE
KINGSLEY
STREET
SUMMERFIELD
EMORY
COOKMAN
LAKE
GRAND
MONROE
HECK
JAMES
ST.
KINGSLEY ST.



Sampling Point
Sampling Point
WESLEY
LAKE
GRAND
GRAND AVE.
EMORY ST.
HECK ST.
COOKMAN
BOND
AUDITORIUM
PILGRIM PATHWAY
SURF
ATLANTIC
SPRAY
SQUARE

APPENDIX A

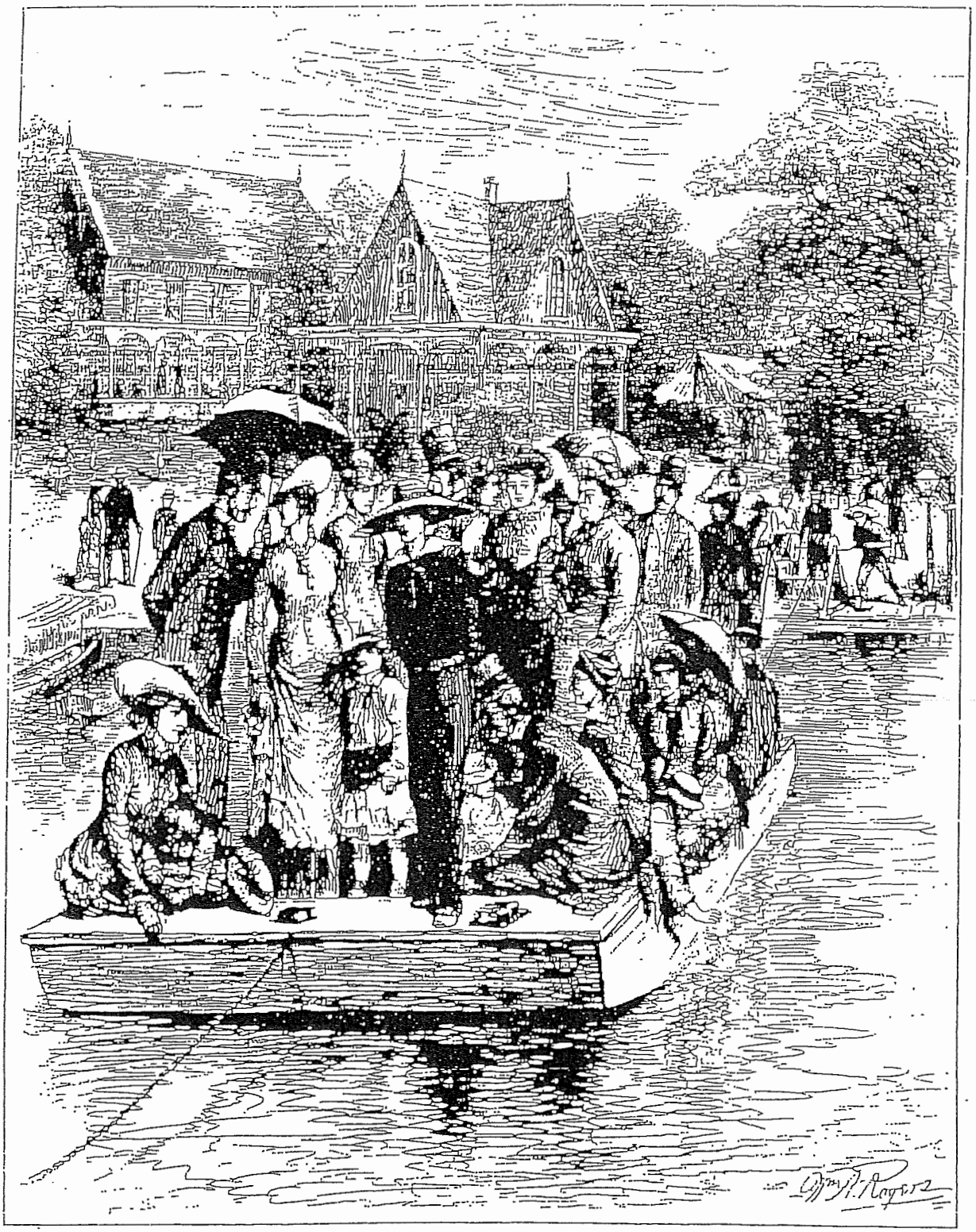
HISTORY OF WESLEY LAKE
By Philip May

HARPER'S WEEKLY

A JOURNAL OF CIVILIZATION

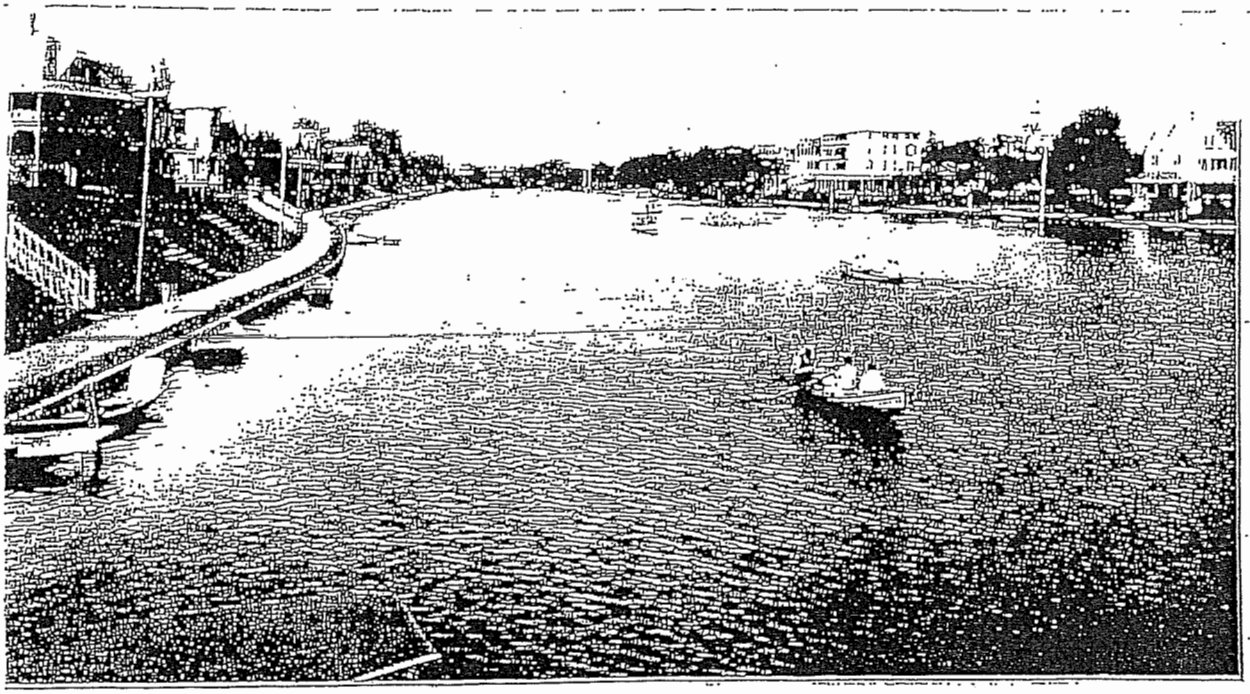
VOL. XXII.—No. 1141.] NEW YORK, SATURDAY, AUGUST 31 1878. [WITH A SUPPLEMENT. PRICE TEN CENTS.

Entered according to Act of Congress, in the year 1878, by Harper & Brothers, in the office of the Librarian of Congress, at Washington.



DOWN BY THE SEA—FERRY OVER WESLEY LAKE OCEAN GROVE.—DRAWN BY W. A. ROGERS

Asbury Park The Twin Cities Ocean Grove

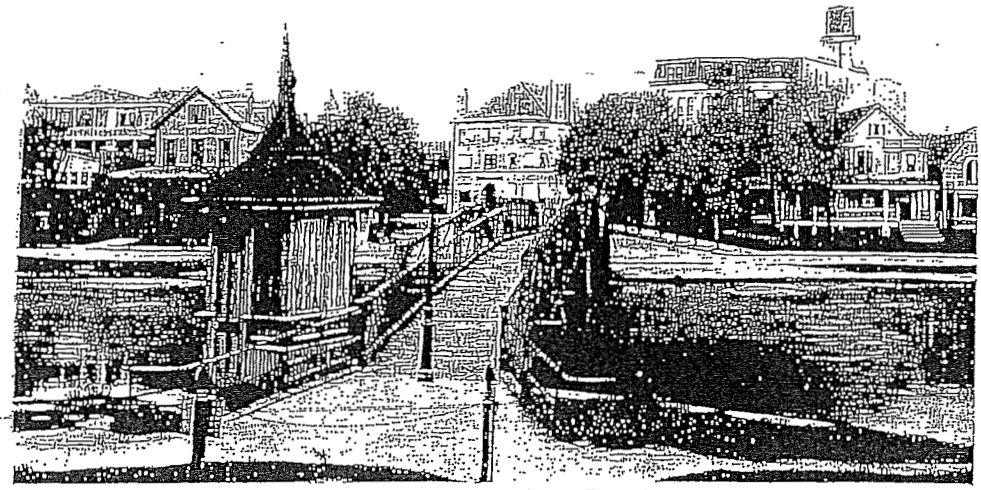


WESLEY LAKE WHICH SEPARATES THE PARK FROM THE GROVE.

Wesley Lake, originally known as Long Pond, is situated between Ocean Grove (now part of Neptune Township) and Asbury Park. Before 1869 it was an unspoiled natural body of water. Frequently storms and the beating waves of the surf would cut out the sand embankment and permits its waters to flow into the Atlantic Ocean. Ocean Grove and Asbury Park developed this lake after 1869 for recreation. Pictures of the lake and reports from that time to about 1970 show a picturesque lake used for passive recreation.

A few years after the founding of Ocean Grove in 1869, it became necessary to build dams, floodgates and flumes to control the water in the lake. Weather, increased by heavy rains or attacks by the surf made this a necessity.

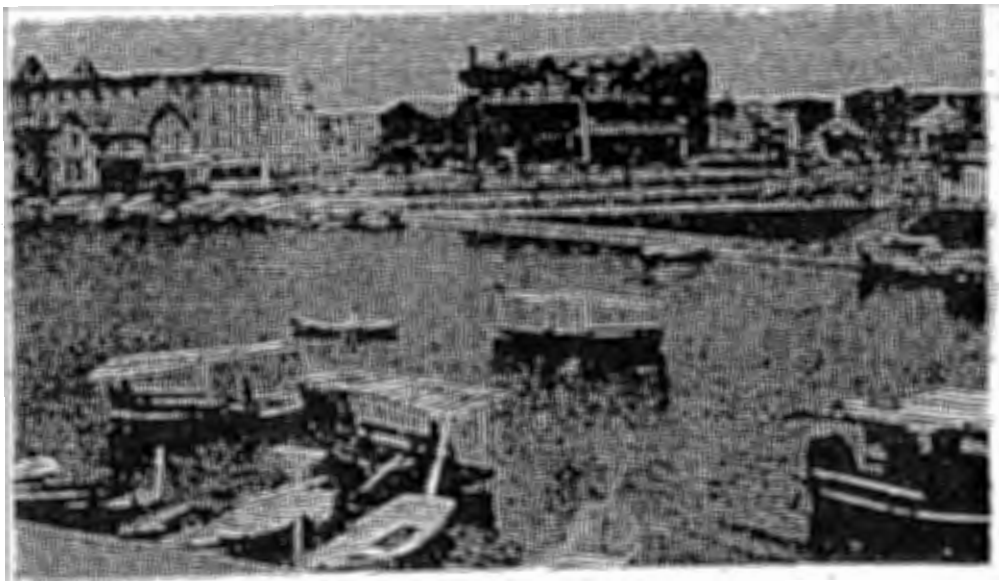
Iron toll bridges were erected across this lake connecting Ocean Grove and Asbury Park. Over 500,000 people use these bridges during the months of June, July, August and September by 1890.



Bridge over Wesley Lake, Asbury Park, N. J.

Boating, bathing, and fishing were the chief recreational uses of this lake. In 1880, there were 530 boats on the lake. This was just 10 years after the founding of Ocean Grove.

> "The first and chief recreation for the evening beginning with the sundown hour was the boating on Wesley Lake, then known as Long Pond. From seven o'clock the lake was literally alive with boats. These were of all sizes, from the tiniest shell to the sixteen foot rowboat. They were generally loaded to their capacity with men, women and children. This being in fact the only evening out-of-door recreation, it was indulged in to the limit." [1]



WESLEY LAKE, ASBURY PARK, N. J.

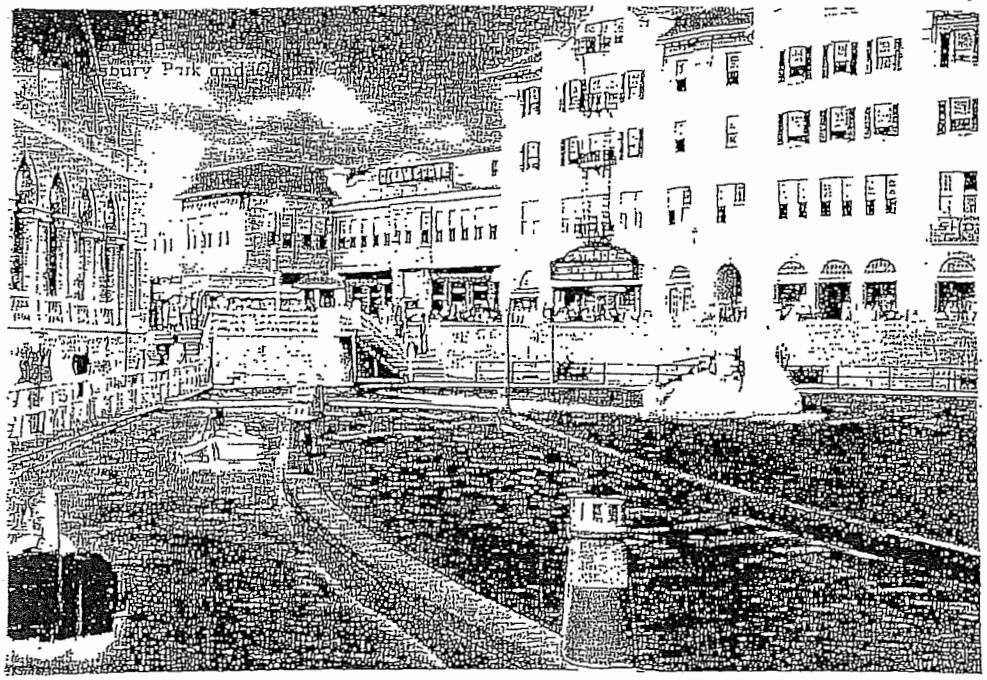
Many of these boats were not only used for pleasure but also were sources of income to their owners in transporting excursionist from the head of the lake, the western most end near the Railroad station, to the ocean and back again. Visitors could also hire these boats for boat rides around the lake. Ferry boats were also used.

1 The Story of Ocean Grove Related in the Year of its Golden Jubilee, by Morris S. Daniels; The Methodist Book Concern, New York/Cincinatti; 1919; page 155

One of the most interesting and outstanding events during those early years was the annual carnival held on Wesley Lake. "Boats were gaily decorated with flags and bunting. In the evening the illuminated boats with their varicolored Chinese lanterns formed a procession led by a boat carrying the Marshal and followed by boats carrying a band. With hundreds of boats on Wesley Lake joining this procession, the picture became one of entrancing beauty." [2]

The lake was also the scene for recreation in the winter. People from all over the area came to Wesley for ice skating. There is also documentation of ice cutting on the lake. The ice was cut from the lake, and stored for refrigeration

This recreational use of Wesley Lake spanned over a century, literally, millions of people received great enjoyment from this natural body of water. Over the years, the carnivals gave way to more entrepreneurial means of recreation. Paddleboat rentals, motor boats, the great swan boat and the showboat were among the attractions on the lake. These recreational activities were there for all to enjoy.



As the area developed, storm drains were directed into Wesley Lake. The lake now served an additional purpose. However, it never ceased to be used for its original purpose, that being a recreational lake.

The current condition of this lake, which has been the source of delight for millions of people since 1870, is tragic. If these men, women and children who had such treasured memories of the lake could see this once jewel of a lake today, they would find it heart-breaking to see what has happened to it.

Since about 1970, there has been total neglect. Neither municipality, Ocean Grove and then Neptune Township (Ocean Grove became part of Neptune Township in 1979) and Asbury Park, had made any real effort to maintain and manage this God-

2 The Story of Ocean Grove Related in the Year of its Golden Jubilee, by Morris S. Daniels; The Methodist Book Concern, New York/Cincinatti; 1919; page 157

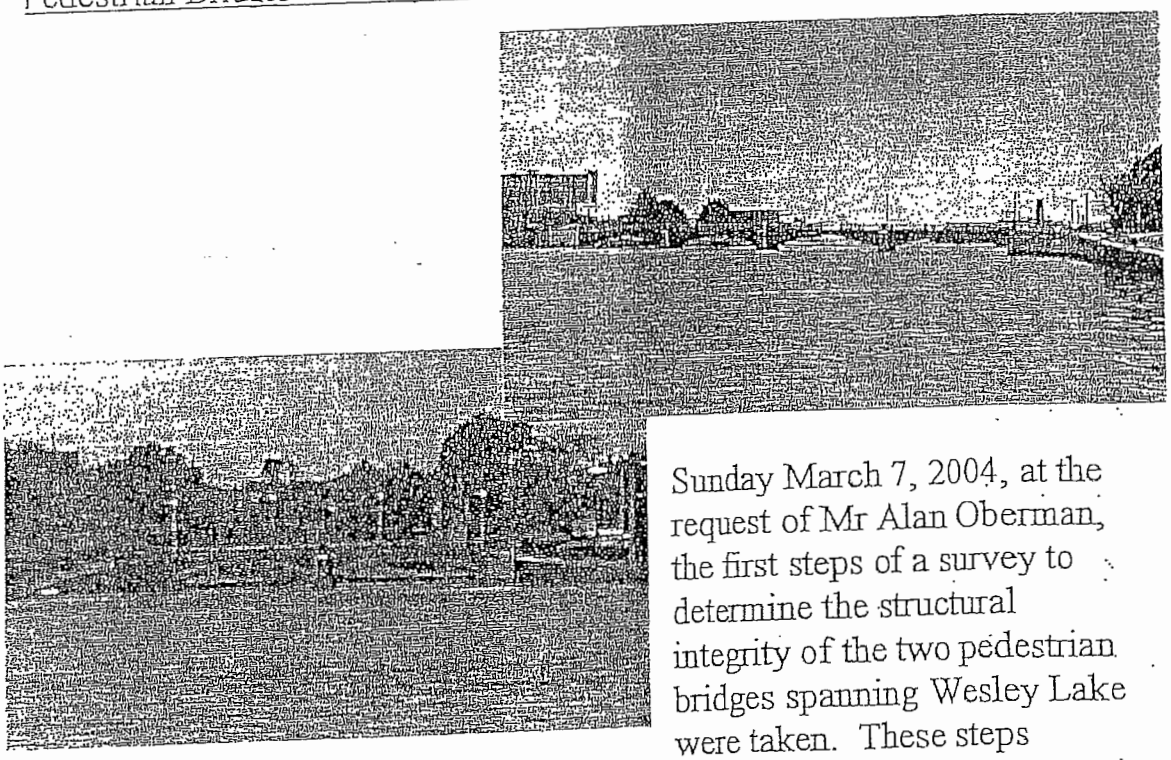
given resource. Retaining walls have been left to deteriorate and cave in, maintenance and dredging activities had virtually come to a stand still. The lake has received the runoff from the storm drains from miles around, as the area developed, filling it with silt and debris.

Our goal is simple. - the restoration of Wesley Lake to an environmentally healthy and beautiful natural resource. This can only be achieved by correcting the deplorable conditions that currently exist in order to return the lake to its former glory.

APPENDIX B

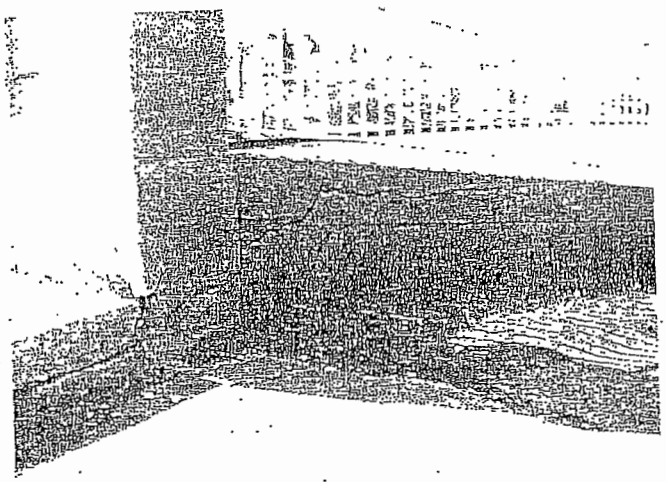
PEDESTRIAN BRIDGE EVALUATION
By Citizens for Wesley Lake

Pedestrian Bridges – Wesley Lake

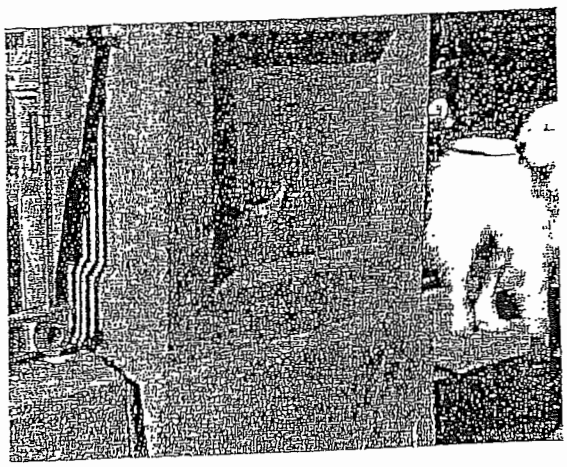


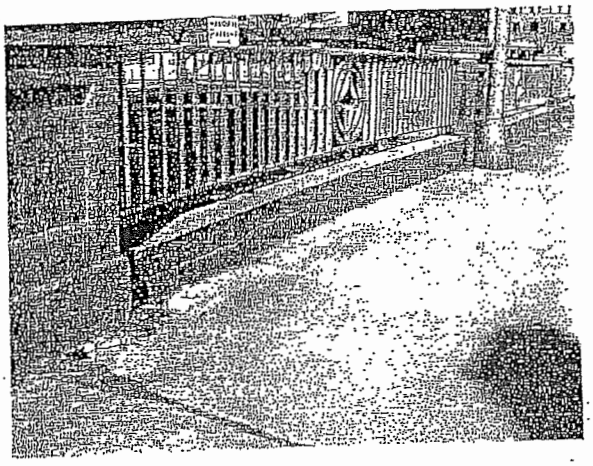
Sunday March 7, 2004, at the request of Mr Alan Oberman, the first steps of a survey to determine the structural integrity of the two pedestrian bridges spanning Wesley Lake were taken. These steps include a visual examination of both structures, the beginning of a photographic record of conditions, and a mechanical assay of the concrete. Included in the scope of the project is a similar examination of the bulkheads and retaining walls lining the shores.

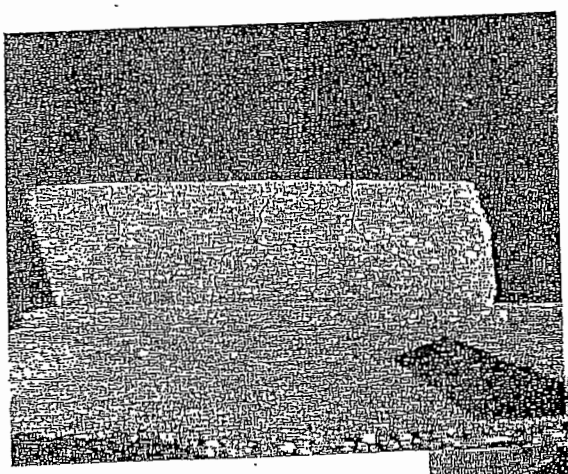
In this initial foray, being afoot, and not having access to the under-structure, we were limited to the bridge approaches, bed, balustrade, and those sections of the piers visible from the shore or roadbed.



The breakdown is most notable due to the plenitude of cracks and flaws such as that shown, in the photo, at left. As will be seen in other images presented, these imperfections are numerous, and in their numbers somewhat daunting. However, when probing the concrete with a metal blade, the material itself proved to be hard and the aggregates well bonded.

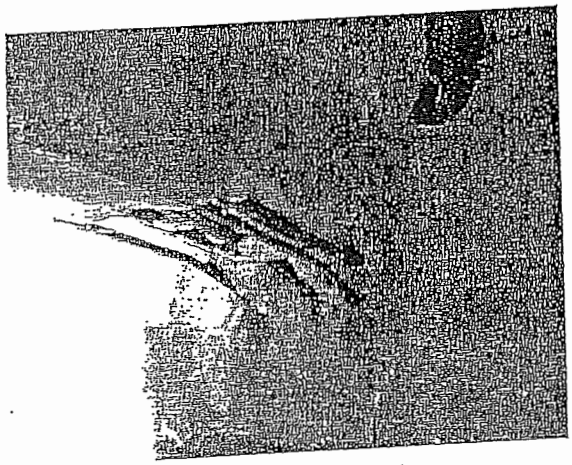


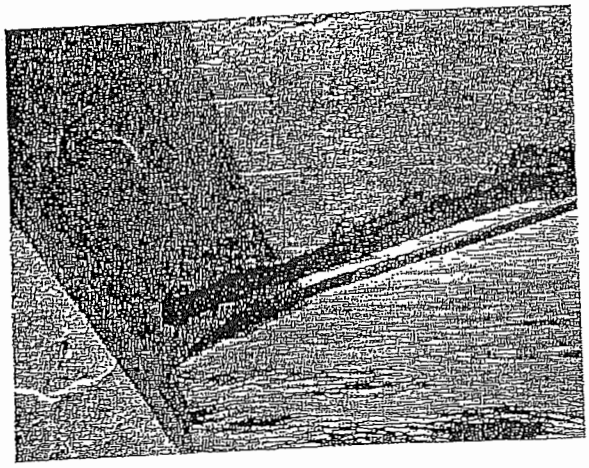


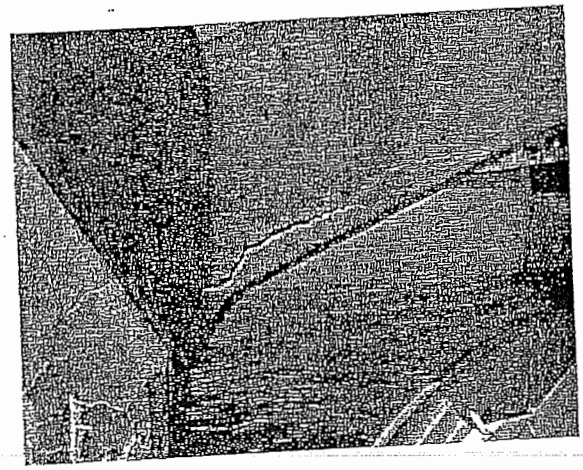


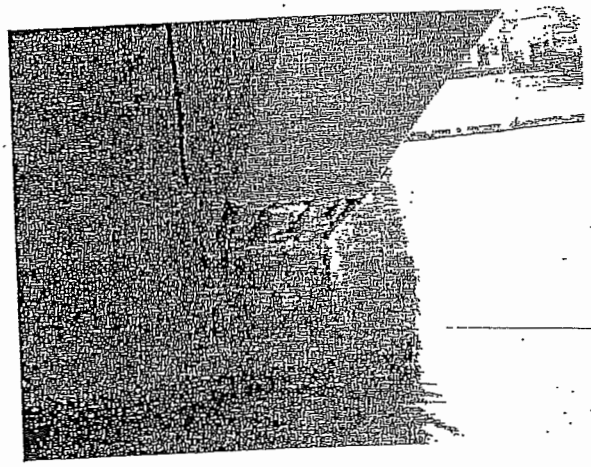
The two photos above, taken at the same approach as the first, are further examples of a similar decay. The four in the lower half of the page are indicative of the conditions prevalent among the piers that support the roadbed.

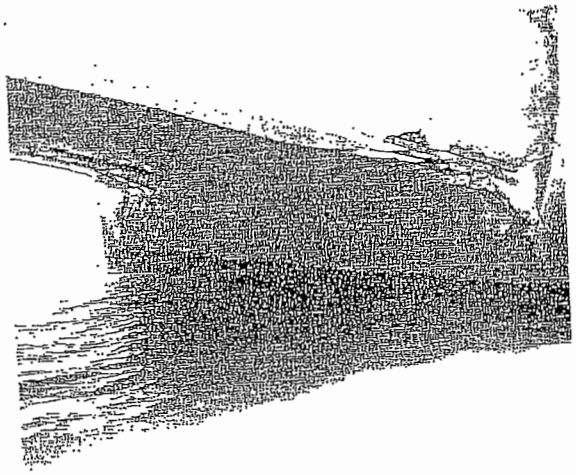
In order to gain a more complete understanding of the situation, an appointment was made to obtain the use of a boat, and examine the undersides of the bridges. On May 30, 2004, the following photos were taken.

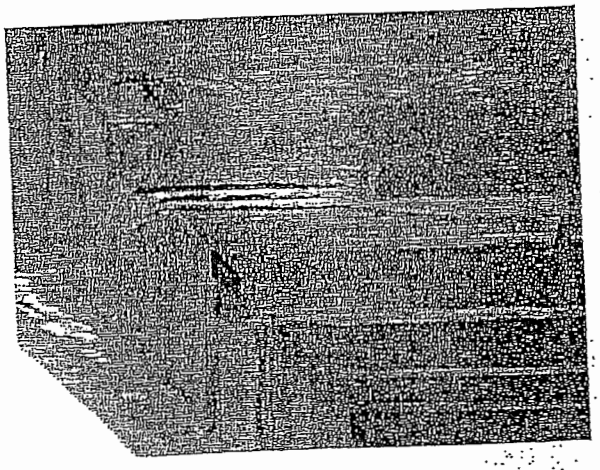


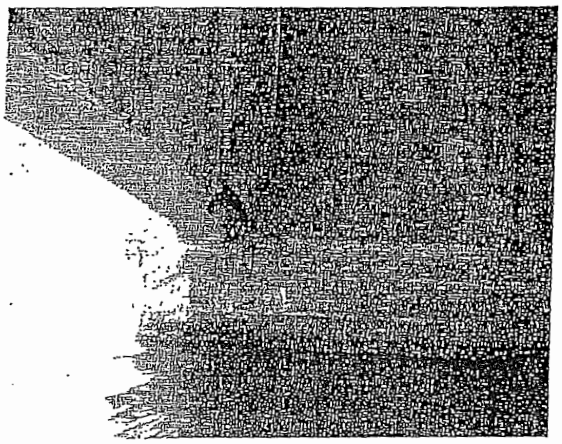


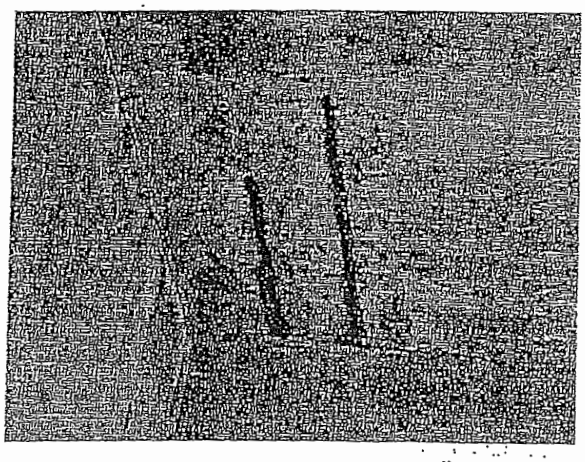










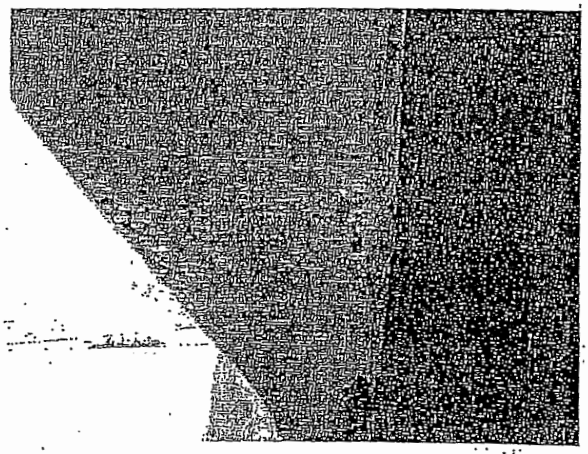


Using these photos as reference, it is possible to make these observations:

a) As with most problems in concrete structures, a major contributor is probably water infiltration.
b) The concrete itself, although exhibiting many fractures and flaws is still for the most part hard and intact.

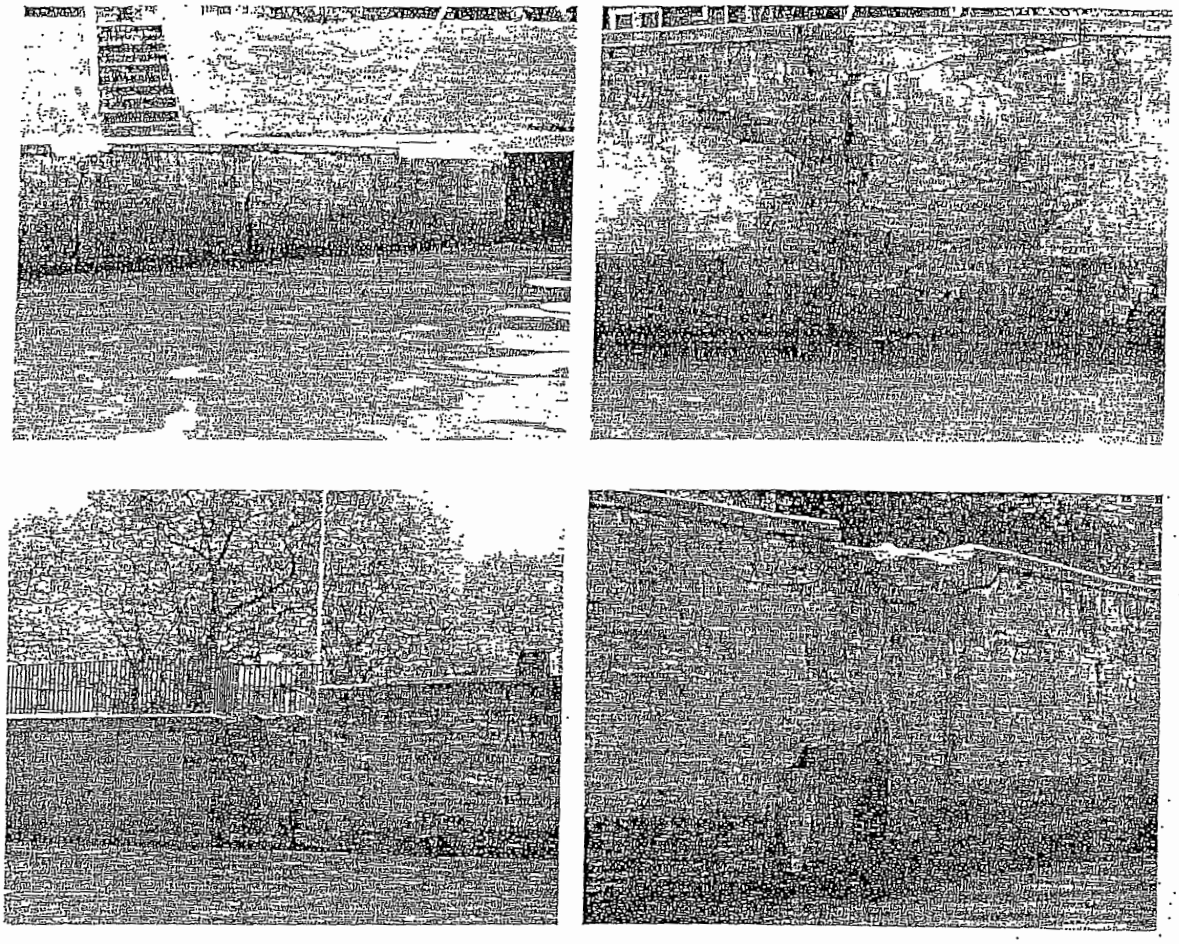
Water infiltration in reinforced concrete construction attacks in two ways. One causes the breakdown of the concrete itself through accretion of salts and acids, and the other, which seems more applicable to this particular situation, causes corrosion of the reinforcing rods. The oxides created by this corrosion occupy a larger volume than the intact metal and the expansion of the mass supplies sufficient internal pressure to crack the concrete. Once these cracks occur, increased ingress for moisture accelerates the corrosion, resulting in further deterioration. The reinforcing rods in these last eight images appear to have been set too close to the surface of the pour, and so, expansion of the oxides has caused first cracking, as shown in the earlier photos, and then exfoliation, exposing the rods completely.

Porosity due to poor compaction during the initial pour, such as that shown, at right, probably also contributed to the decay.



A visual inspection can only provide indicators as to the problem, and suggest possibilities as to how one might attempt to rectify the situation. However, in order to accurately assess conditions, as they currently exist, it will be necessary to probe the structures. Possibilities include intrusive procedures such as coring, or non-intrusive techniques such as ultra-sound, or boroscopy. It is commonly accepted that the services of an engineer be retained to conduct or guide this process. Rick Burke, of Becht Engineering has been contacted; he has visited the site, and is preparing a proposal recommending technique and procedure for in depth analysis.

Retaining Walls – Wesley Lake



As the photos above illustrate, there has been significant decay in the concrete retaining walls that line the lake. Cracks, shifted sections, and crumbling are the major concerns. For the most part, as with the bridges, the concrete is still hard and well bonded. At this time it should not be too difficult to stabilize the segments relative to each other, and inject a grout to seal the cracks. Likewise, excision and repair, of the crumbled areas, should not present too great a difficulty.

There is noticeable rot in the metal bulkheads that line the balance of the shore. Areas have corroded to the point that soil backing up to the walls is washing into the lake, leaving potentially dangerous depressions. In addressing these problems, it is suggested that the product line and services of a company called Green Mountain International, Inc, be explored. They

offer proven solutions to all the questions mentioned above, from soil stabilization, to structural repair.

GREEN MOUNTAIN INTERNATIONAL INC.
235 PIGEON STREET
WAYNESVILLE NC 28786

1-800-942-5151 Toll Free US/Canada
1-888-632-5360 Toll Free Fax
1-828-456-9970 International Phone
1-828-456-9699 International Fax

E-MAIL

Main E-mail Address
gmi@mountaingrout.com

Information
info@mountaingrout.com

Sales
sales@mountaingrout.com

Technical Information
tech@mountaingrout.com

Equipment Information
equipment@mountaingrout.com

On becoming a Representative
reps@mountaingrout.com

COMPANY PROFILE

Green Mountain International, Inc. was established in 1987. The company manufactures a variety of polyurethane and epoxy products for the construction industry. Some are designed to stop water leaks. Other uses are to repair cracks or joints in concrete structures, such as foundation walls, tunnels, dams, and large diameter pipes.

The company is located in Waynesville, North Carolina with the principal distribution center in Chicago, IL. Green Mountain sells its products directly to specialty contractors, other end-users and to construction-oriented distributors throughout the USA. The company has independent sales representatives in most areas. Experienced technical staff may be reached at the corporate office either by telephone, facsimile or by e-mail.

The products are sold under the registered trademark of Mountain Grout®. Mountain Grout "Flexible" is UL Listed for contact with potable water and USDA approved for use in food processing plants. All Green Mountain products have been tested extensively for environmental impact and have been proven to be safe and effective. All products are manufactured in the United States of America and are warranted to be free of defect.

Green Mountain International, Inc. employs professional staff that includes personnel experienced in technical application procedures, material safety and handling, chemical formulations as well as export procedures relating to shipping and financial issues.

Contractors

Over the years the author has had occasion to deal with various contractors. Two companies active in the area and qualified to handle the scope of this project are listed below.

C&C Ripoll Masonry Inc
122 State Highway 34N
Howell, NJ, 07731
Phone: (732)-919-3733 Fax: (732) 919-3736
Email: Info@ccripoll.com

Masonry Preservation Group Inc.
706 West Maple Avenue
Merchantville, NJ 08109
Phone: (856) 663-4158 • Fax: (856) 663-4156
Email: info@masonrypreservationgroup.com

About the author

Joel Monesson has experience in the building trades dating from 1971, an involvement with the plastic arts since 1976, and operated as a masonry contractor beginning in 1992. From 2002 to the present time, he has been on staff at Georgian Court University, in Lakewood, NJ, charged with conservation and restoration of sculpture and historic masonry. Georgian Court is listed on the state and national level as a Historic Landmark Site.

APPENDIX C

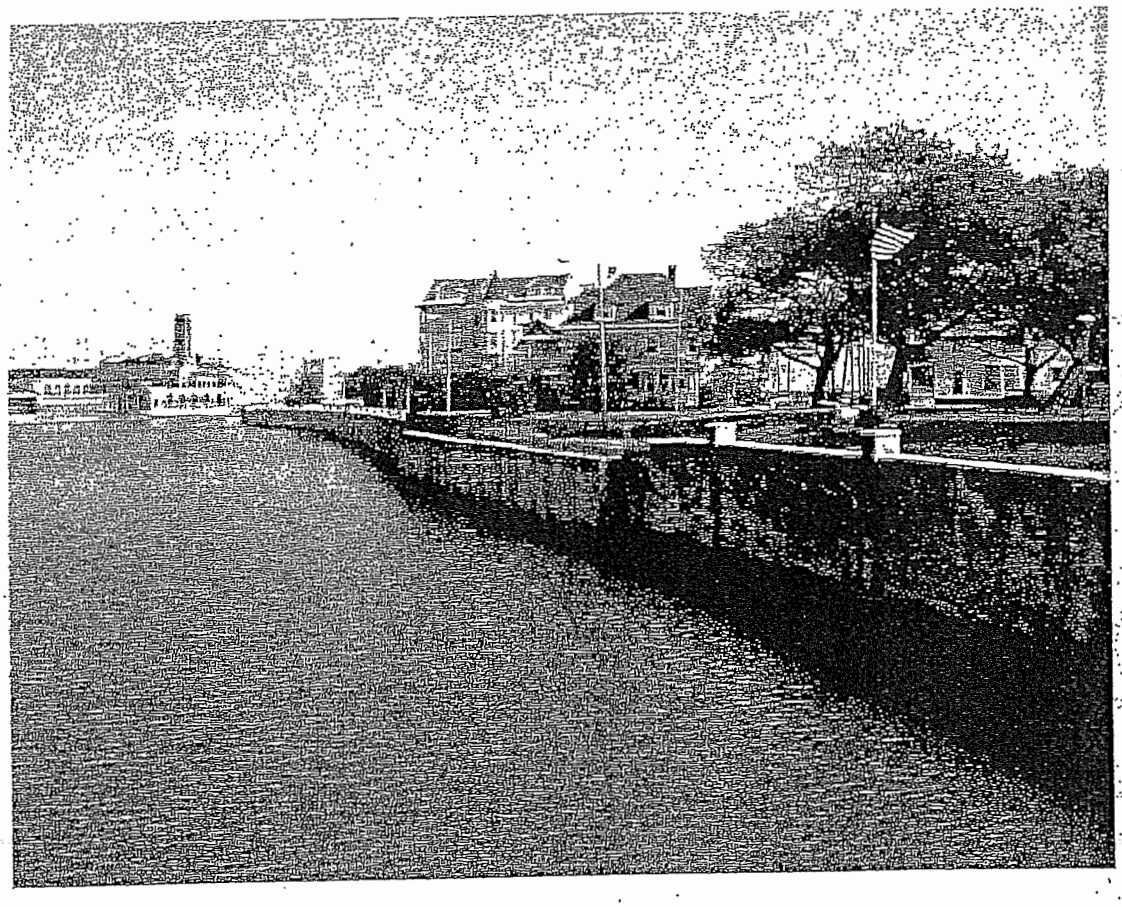
STRUCTUAL WALL SURVEY
By Birdsall Corp.

Job No. 2-00007-400007

STRUCTURAL WALL SURVEY

WESLEY LAKE - SOUTH WALL
TOWNSHIP OF NEPTUNE, NJ

OCTOBER, 2003



Prepared For:

Township of Neptune
25 Neptune Boulevard
P.O. Box 1125
Neptune, NJ 07754

Prepared By:

Birdsall Engineering, Inc.
611 Industrial Way West
Eatontown, NJ 07724

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2.0	EXISTING WALL CONDITIONS	1
2.1	STATION 0+00 TO 19+00±	1
2.2	STATION 19+00± TO 34+00	2
3.0	SUMMARY AND RECOMMENDATIONS	4

APPENDIX A	PHOTOGRAPHS
APPENDIX B	TYPICAL WALL REPLACEMENT SECTIONS
APPENDIX C	WALL SURVEY MAP

1.0 INTRODUCTION

Birdsall Engineering, Inc. (BEI) performed a visual structural survey of the wall that borders the south length of Wesley Lake in the Township of Neptune, New Jersey. Wesley Lake is a 15 acre body of water that serves as the boundary between the northern end of the Ocean Grove Section of Neptune and the southern end of the City of Asbury Park. The lake is approximately 3,400 linear feet in length and contains various types of walls along its south side. The western half of the lake's south shore contains a steel sheeting bulkhead-style wall. The eastern half of the lake's south shore contains a concrete gravity wall with the exception of two small sections that contain a newer concrete bulkhead-style wall.

In general, the walls along the south shore of Wesley Lake are in poor to extremely poor structural condition, with a few sections of the wall in a failed condition. All walls along the south shore of Wesley Lake, with the exception of two small sections of newer wall, have outlived their expected lifespan and should be replaced. It is understood that funding will play a vital role in the ability to replace these walls. Total wall replacement has been estimated to cost over $2,000,000.00. This report has been prepared to provide a documented structural survey of the walls and to prioritize the areas in greatest need of replacement. This report is intended to assist the Township in its future planning and allocations of funds for Wesley Lake improvements.

2.0 EXISTING WALL CONDITIONS

The following section identifies the different segments of wall along the south shore of Wesley Lake. Further, this section documents each segments conditions, estimates its replacement cost, and applies a priority ranking to assist in determining the most critical segments of wall should the wall reconstruction be performed in stages. The priority ranking ranges from a rank of 1 (most critical) to a rank of 7 (least critical). Reference Appendix C for an illustrated layout of the different wall segments. See Appendix A for photographs of the wall segments.

2.1 STATION 0+00 to 19+00± Priority 7

Wall Type: 1,900 L.F. Steel Sheeting Bulkhead Wall

Exposed Height: 3 Feet

Replacement Cost: $350/Linear Foot = $665,000.00

Condition: Steel sheeting is aged, rusting and contains extensive deterioration and large holes at the water line (See Photos No. 15 and 16). Deterioration of the steel at the water line has led to compromised structural integrity in the sheeting. No signs of excessive movement were observed in the wall. The wall, with major section loss and holes, is in poor structural condition.

2.2 STATION 19+00± to 34+00

Wall Type: 1,355 L.F. of Old Concrete Gravity Wall
145 L.F. of Newer Concrete Bulkhead Wall

Exposed Height: 10 Feet

Replacement Cost: $1,100/Linear Foot = $1,500,000.00 for Older Sections Only

A. ***Station 28+60 to 29+30 - Priority 1***
(70 L.F., $77,000)

Condition: Old concrete gravity wall contains excessive vertical and lateral movement (See Photos No. 9 and 10). Wall is leaning outward and has shifted a few feet from its original position. This segment of wall is in failed condition and has the potential for continued movement and complete failure. This segment of wall obviously needs replacement. In the interim, this segment of wall should be cordoned off as the potential for further movement exists.

B. ***Station 33+00 to 34+00 - Priority 2***
(100 L.F., $110,000)

Condition: Old concrete gravity wall contains excessive thru-wall cracking and shifting that has led to large sections of wall to become unstable (See Photos No. 4 to 6). The concrete is in extremely poor condition and is in obvious need of replacement. In the interim, this segment of wall should be cordoned off due to this unsafe condition.

C. ***Station 29+30 to 31+00 and Station 31+45 to 33+00 - Priority 3***
(325 L.F., $357,000)

Condition: Old concrete gravity wall contains excessive wall cracking, scaling and spalling with many areas of loose spalled concrete on the verge of falling off the wall face (See Photos No. 7 and 8). The wall also contains some lateral movement. The loose spalled concrete presents a danger to anyone up against the face of the wall. Removal of the spalled concrete is infeasible, and like the other concrete wall, requires replacement. In the interim, the public should be kept off the wall and away from the face of the wall.

D. *Station 23+30 to 28+60 - Priority 4*
(530 L.F., $583,000)

Condition: Old concrete gravity wall in similar condition to Section 2.2C, above, however with less extensive wall spalling. Extensive cracking, scaling and spalling still exists on this wall segment (See Photos No. 11 and 12). Some movement observed in wall (See Photo No. 14).

E. *Station 19+00 to 21+15 - Priority 5*
(215 L.F., $236,500)

Condition: This segment of old concrete gravity wall varies in height from 3 ft. to 10 ft. This wall construction does not match the remaining old concrete gravity wall segments. However, its condition is similar, extremely poor. This segment of wall contains extensive cracking and spalling. Minimal wall movement observed.

F. *Station 21+15 to 22+30 - Priority 6*
(115 L.F., $126,500)

Condition: Old concrete gravity wall with some cracking and spalling. Minimal wall movement observed. Wall appears to be in stable condition.

G. *Station 22+30 to 23+30 and Station 31+00 to 31+45*

Condition: Newer precast concrete 'Bulkhead Style' wall. Wall contains a tie back system. Wall in satisfactory condition. No need for replacement.

The estimated replacement costs calculated for these walls assumes that a new wall is installed directly in front of the lower steel sheeting wall. This wall is assumed to terminate at grade similar to the existing wall and will not contain a railing. The cost of the concrete wall replacement assumes that the top portion of the existing concrete wall will be removed down to several feet below grade. The new wall will then be placed in front of the remaining concrete wall and terminate at grade with a proposed railing installed on top of the new wall similar to the newer precast concrete segments of wall. Reference Appendix B for a sketch illustrating a typical new wall installation. These costs do not include any upland site improvements. It is recommended to not perform any upland site improvements until the wall segments have been reconstructed as necessary.

3.0 SUMMARY AND RECOMMENDATIONS

As outlined above, almost the entire length of wall along the south shore of Wesley Lake is in poor to extremely poor condition. This wall is beyond repair and requires replacement. A few segments of the wall contain unsafe conditions and should be properly cordoned off until a new wall is installed. The optimal choice for a replacement wall for the south shore of Wesley Lake is a bulkhead-style wall similar to the two newer precast concrete segments of wall.

It is highly recommended that the Township of Neptune seek funding for reconstruction of these walls. The reconstruction of these walls should be incorporated into the Township's future Capital Improvement planning. In the meantime, regular inspections of these walls should be performed to maintain a close guard on the condition of the wall.

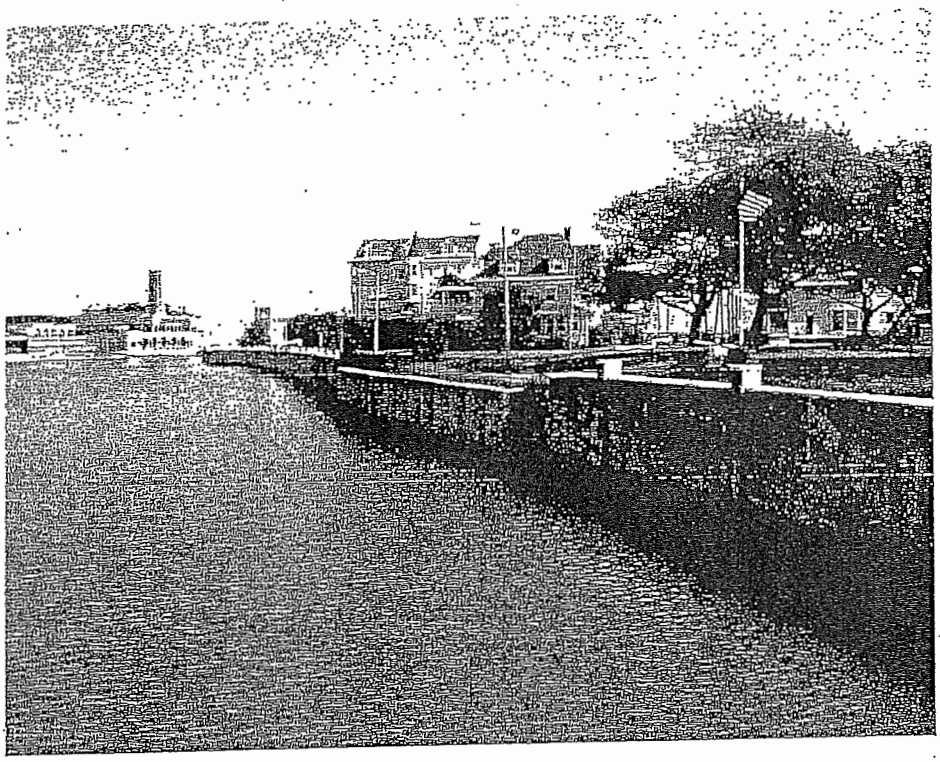


Photo #1 - View looking East from East Pedestrian Bridge. Notice Segment of Newer Concrete Bulkhead Bulkhead Wall.

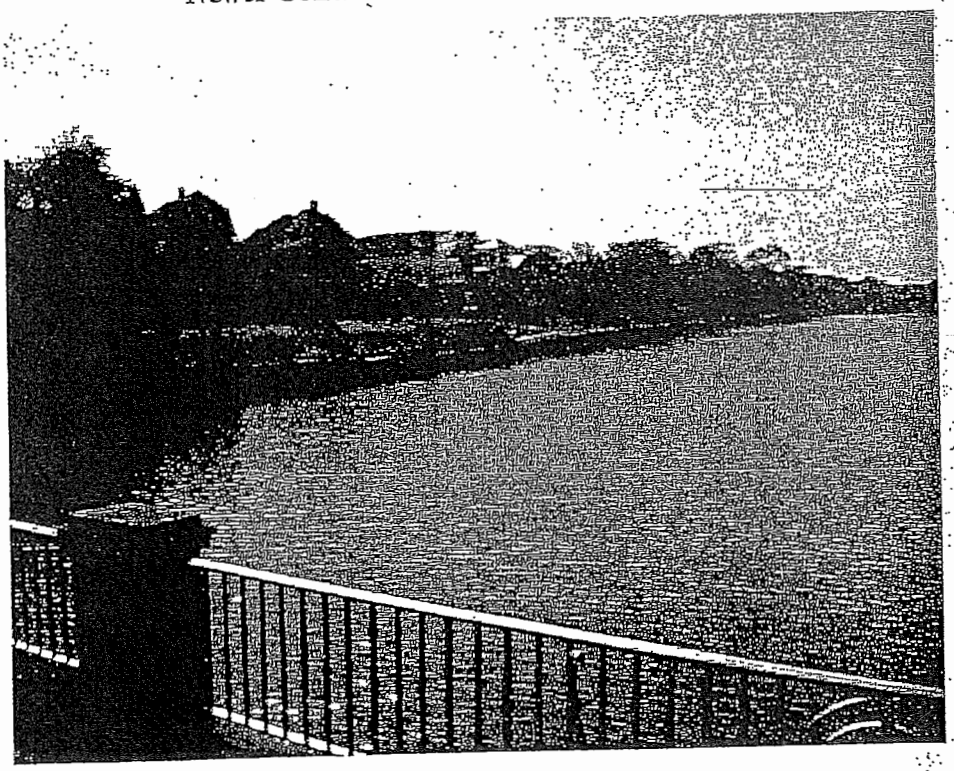


Photo #2 - View looking West from East Pedestrian Bridge.

Photo #3 - View of Headwall at East End of Lake.

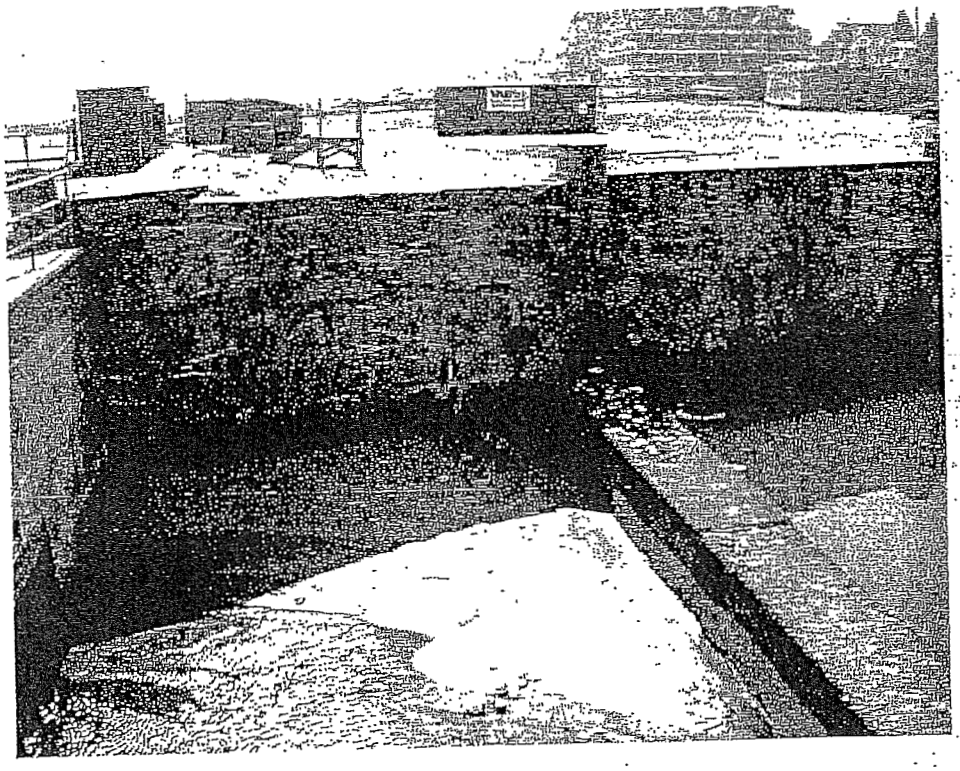


Photo #4 - View of Excessive Wall Shifting and Cracking at East End of Wall which has Resulted in Large Unstable Wall Section.

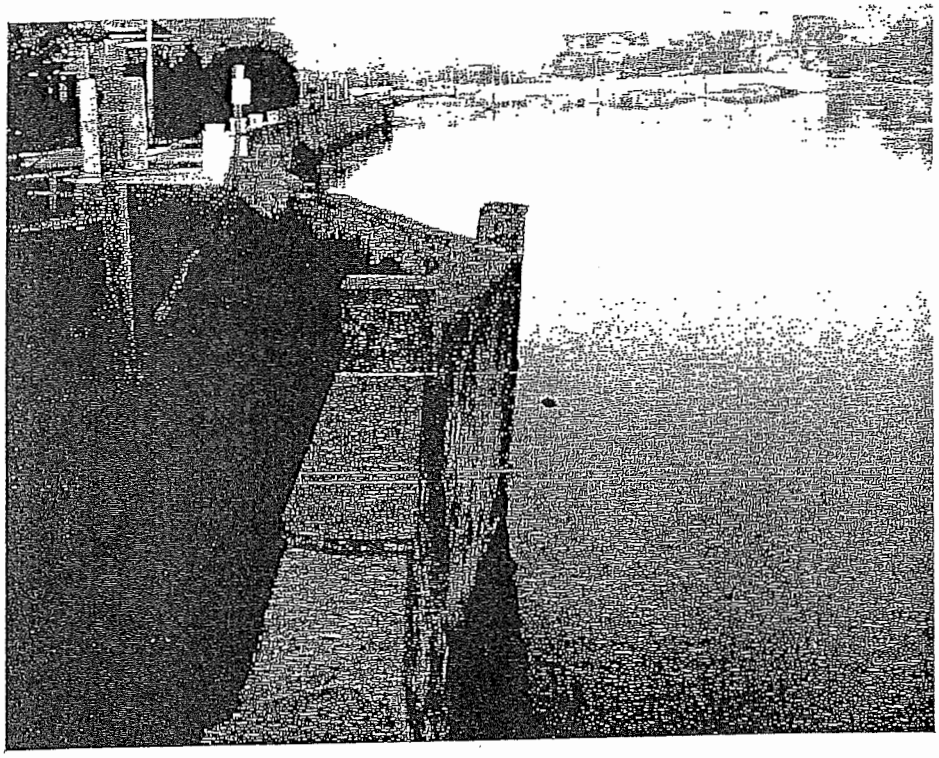


Photo #9 - View of Excessive Movement (Failure) in Wall at Station 29+00.

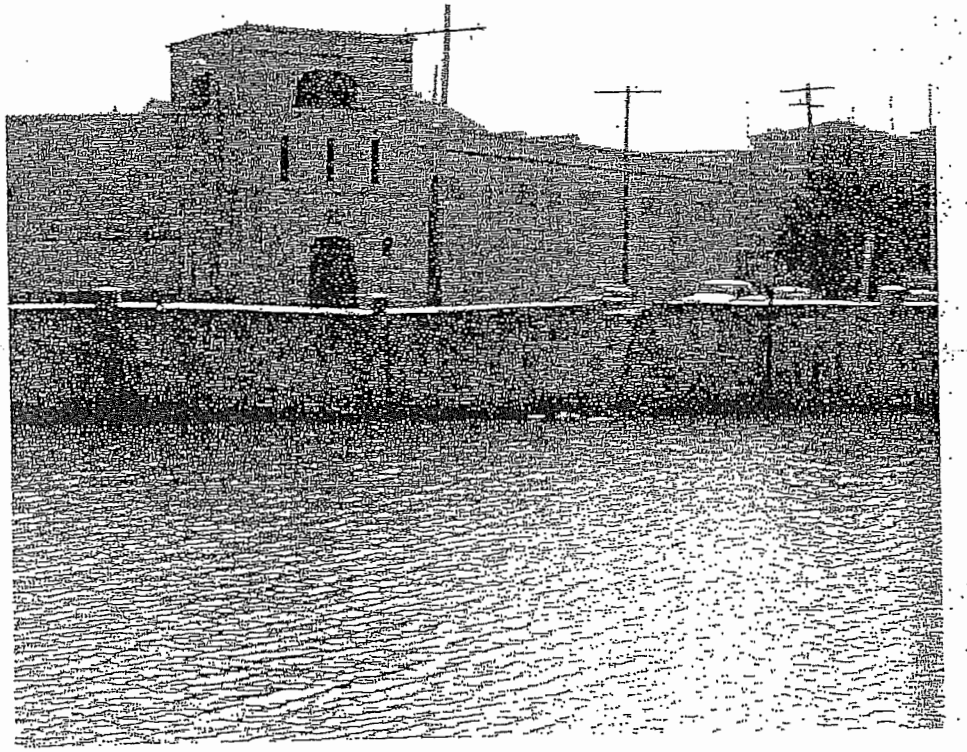
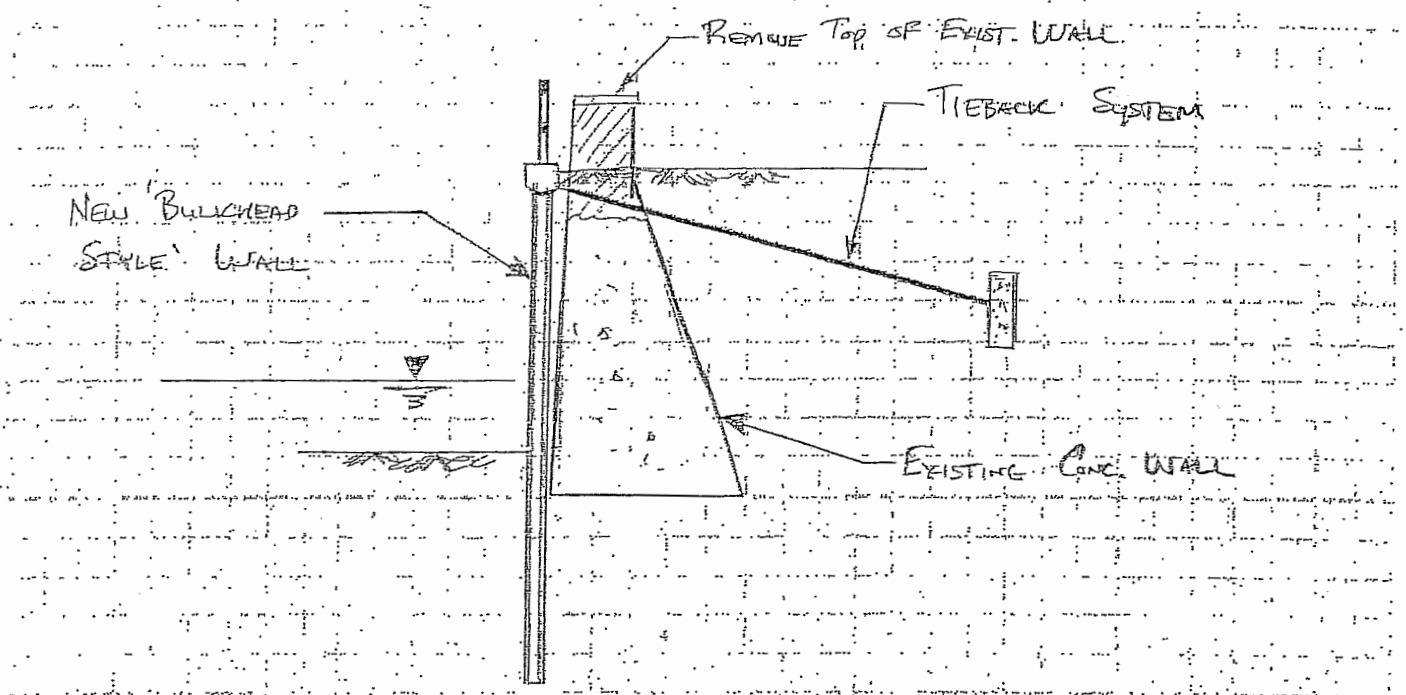


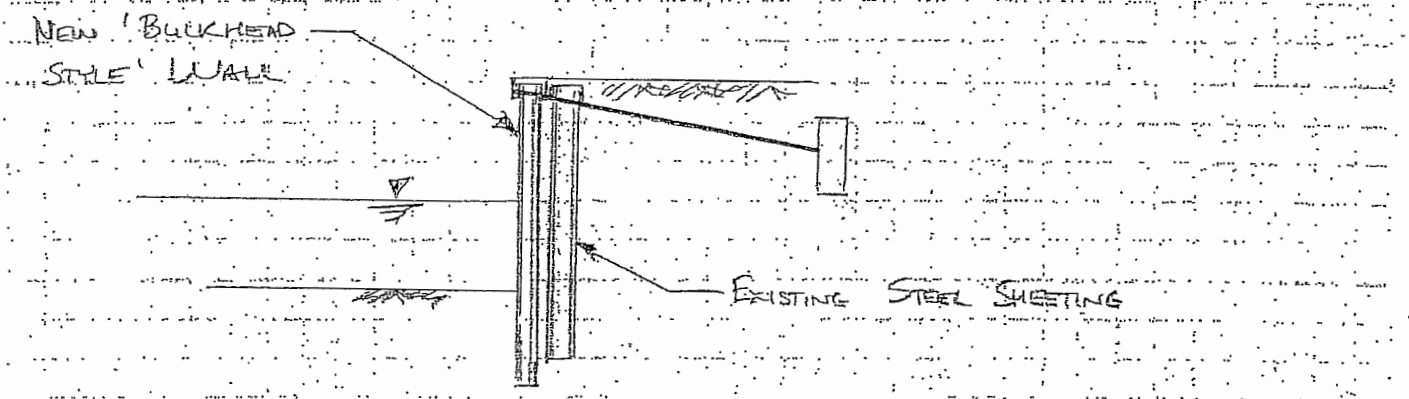
Photo #10 - Front View (Looking South) of Excessive Wall Movement (Failure) at Station 29+00.

TYPICAL WALL REPLACEMENT SECTIONS

SKETCH #1



A. CONCRETE WALL SEGMENTS



A. STEEL SHEETING SEGMENTS

BIRDSALL ENGINEERING, INC.
CONSULTING ENGINEERS AND PLANNERS
1700 MAIN STREET, BELMAR, NJ 07719-3098 - (732) 681-1165

JOB NO. 20000740000

DATE 10-13-02

SHEET NO. _____ OF _____

Subject WESLEY LAKE WALL SURVEY

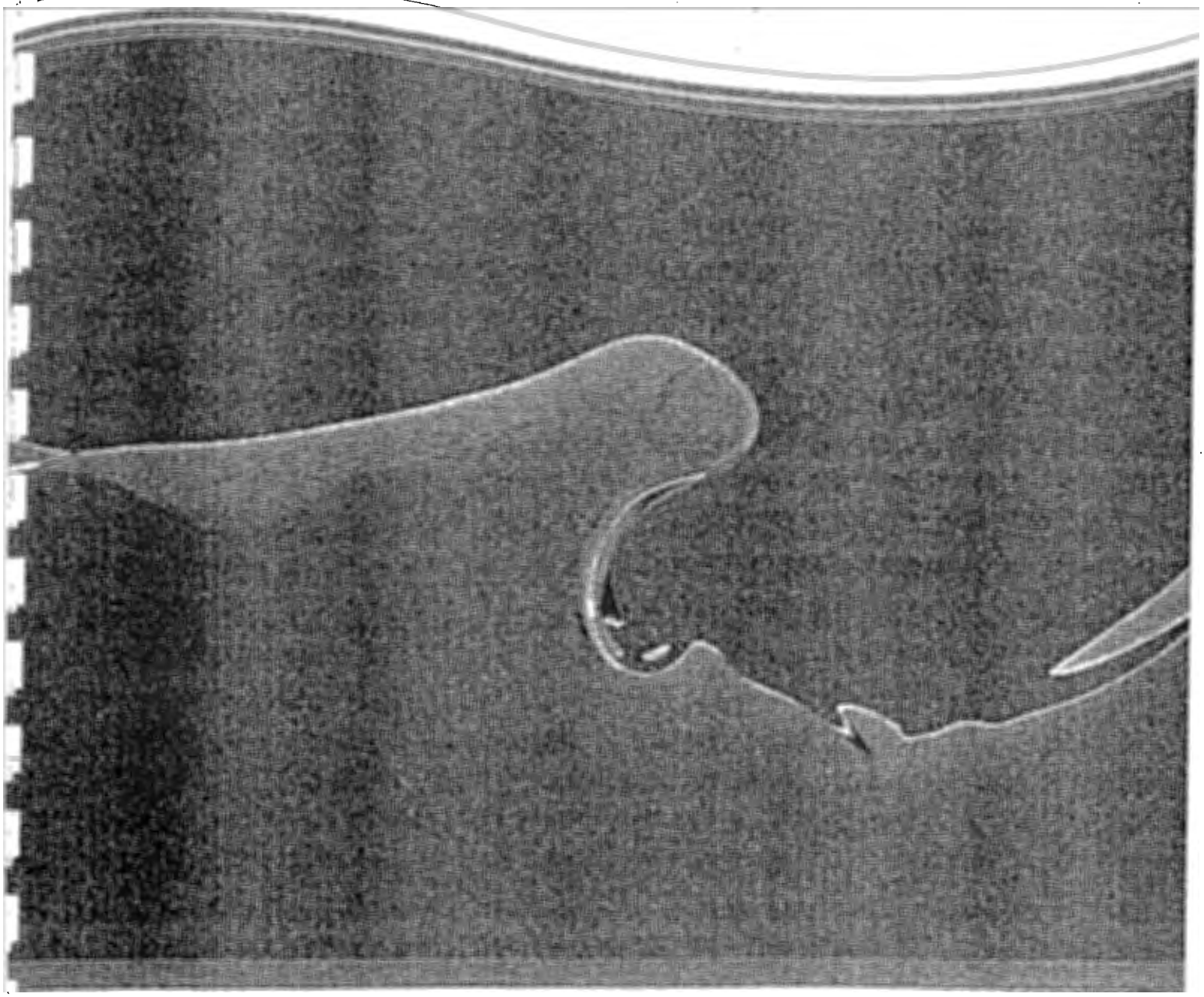
COMPUTED BY RCM

APPENDIX D

STORMWATER MANAGEMENT
Manufacturer Literature

CONTECH®
STORMWATER SOLUTIONS INC.

Hydrodynamic Separation Products

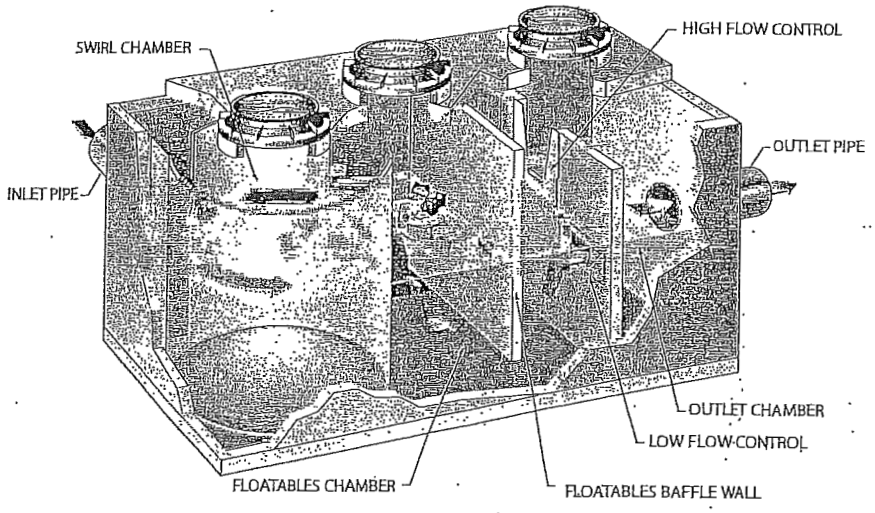


Vortechs®

High performance hydrodynamic separation

The Vortechs system is a high-performance hydrodynamic separator that effectively removes finer sediment, oil and grease, and floating and sinking debris. Its swirl concentrator and flow controls work together to minimize turbulence and provide stable storage of captured pollutants. The design also allows for easy inspection and unobstructed maintenance access. With comprehensive lab and field testing, the system delivers proven results and site-specific solutions.

Precast models can treat peak design flows up to 25 cfs; cast-in-place models handle even greater flows. A typical system is sized to provide an 80% load reduction based on laboratory-verified removal efficiencies for varying particle size distributions such as 50-micron sediment particles.

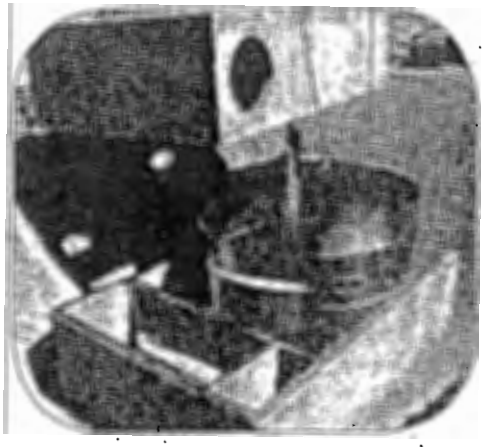


How does it work?

Water enters the swirl chamber at a tangent, inducing a gentle swirling flow pattern and enhancing gravitational separation. Sinking pollutants stay in the swirl chamber while floating pollutants are stopped at the baffle wall. Typically Vortechs systems are sized such that 80% or more of runoff through the system will be controlled exclusively by the low flow control. This orifice effectively reduces inflow velocity and turbulence by inducing a slight backwater appropriate to the site.

During larger storms, the water level rises above the low flow control and begins to flow through the high flow control. The layer of floating pollutants is elevated above the influent pipe, preventing re-entrainment. Swirling action increases in relation to the storm intensity, which helps prevent re-suspension. When the storm drain is flowing at peak capacity, the water surface in the system approaches the top of the high flow control. The Vortechs system will be sized large enough so that previously captured pollutants are retained in the system even during these infrequent events.

As a storm subsides, treated runoff decants out of the Vortechs system at a controlled rate, restoring the water level to a dry-weather level equal to the invert of the inlet and outlet pipes. The low water level facilitates easier inspection and cleaning, and significantly reduces maintenance costs by reducing pump-out volume.



Vortechs

- Proven performance speeds approval process
- Treats peak flows without bypassing
- Flow controls reduce inflow velocity and increase residence time
- Unobstructed access simplifies maintenance
- Shallow system profile makes installation easier and less expensive
- Very low headloss
- Flexible design fits multiple site constraints

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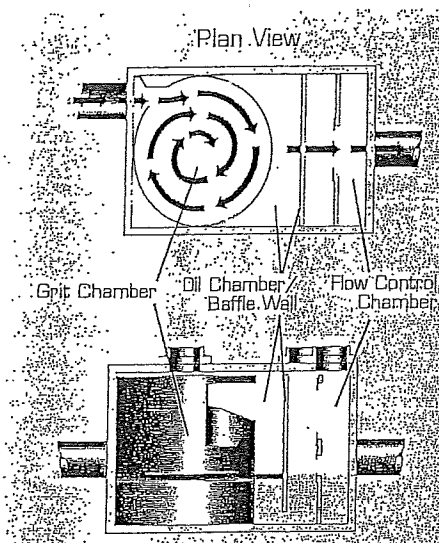
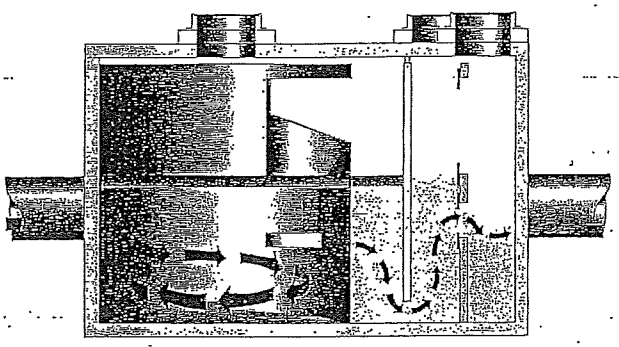
Features & Operation



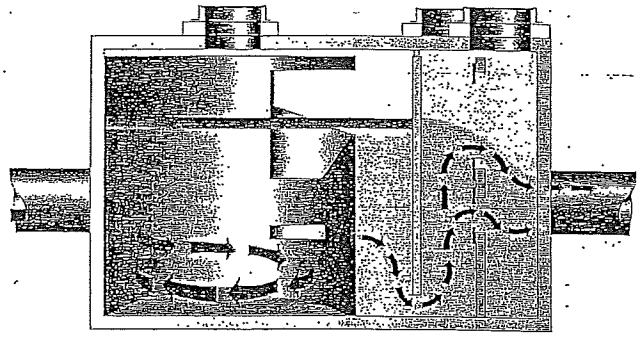
Grit Chamber
The swirling motion created by the tangential inlet directs settleable solids toward the center of this chamber. Sediment is caught in the swirling flow path and settles back onto the pile after the storm event is over.

Oil Chamber & Baffle Wall
The center baffle traps floatables in the oil chamber, even during clean-out. Highly resistant to flow surges.

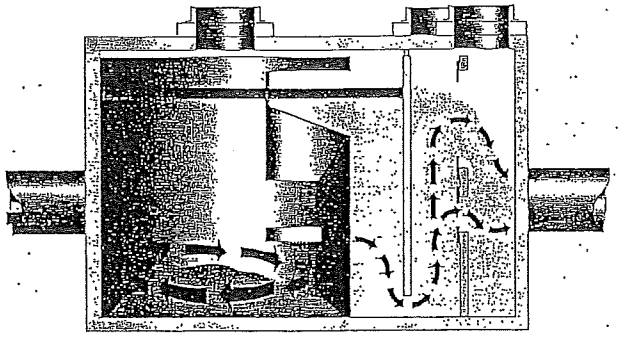
Flow Control Chamber
The weir and orifice flow controls: 1) raise level and volume in the system as flow rate increases; and 2) gradually drain the system as flow rate subsides.



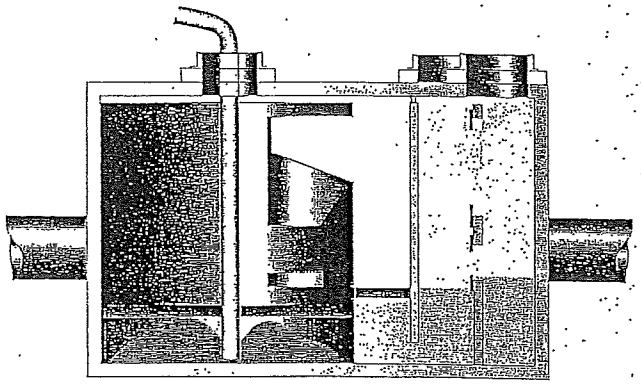
1) Initial Wet Weather Phase
During a two-month storm event the water level begins to rise above the top of the inlet pipe.. This influent control feature reduces turbulence and avoids resuspension of pollutants.



2) Transition Phase
As the inflow rate increases above the controlled outflow rate, the tank fills and the floating contaminant layer accumulated from past storms rises. Swirling action increases at this stage, while sediment pile remains stable.



3) Full Capacity Phase
When the high-flow outlet approaches full discharge, storm drains are flowing at peak capacity. The Vortechs System is designed to match your design storm flow and provide treatment throughout the range of storm events without bypassing. To accommodate very high flow rates, Vortechnics can assist designers with configuring a peak-flow bypass.



4) Storm Subsidence Phase/Cleaning
Treated runoff is decanted at a controlled rate, restoring the water level to a low dry-weather volume and revealing a conical pile of sediment. The low water level facilitates inspection and cleaning, and significantly reduces maintenance costs. The system's central baffle prevents transfer of floatables to the outlet during cleaning or during the next storm.