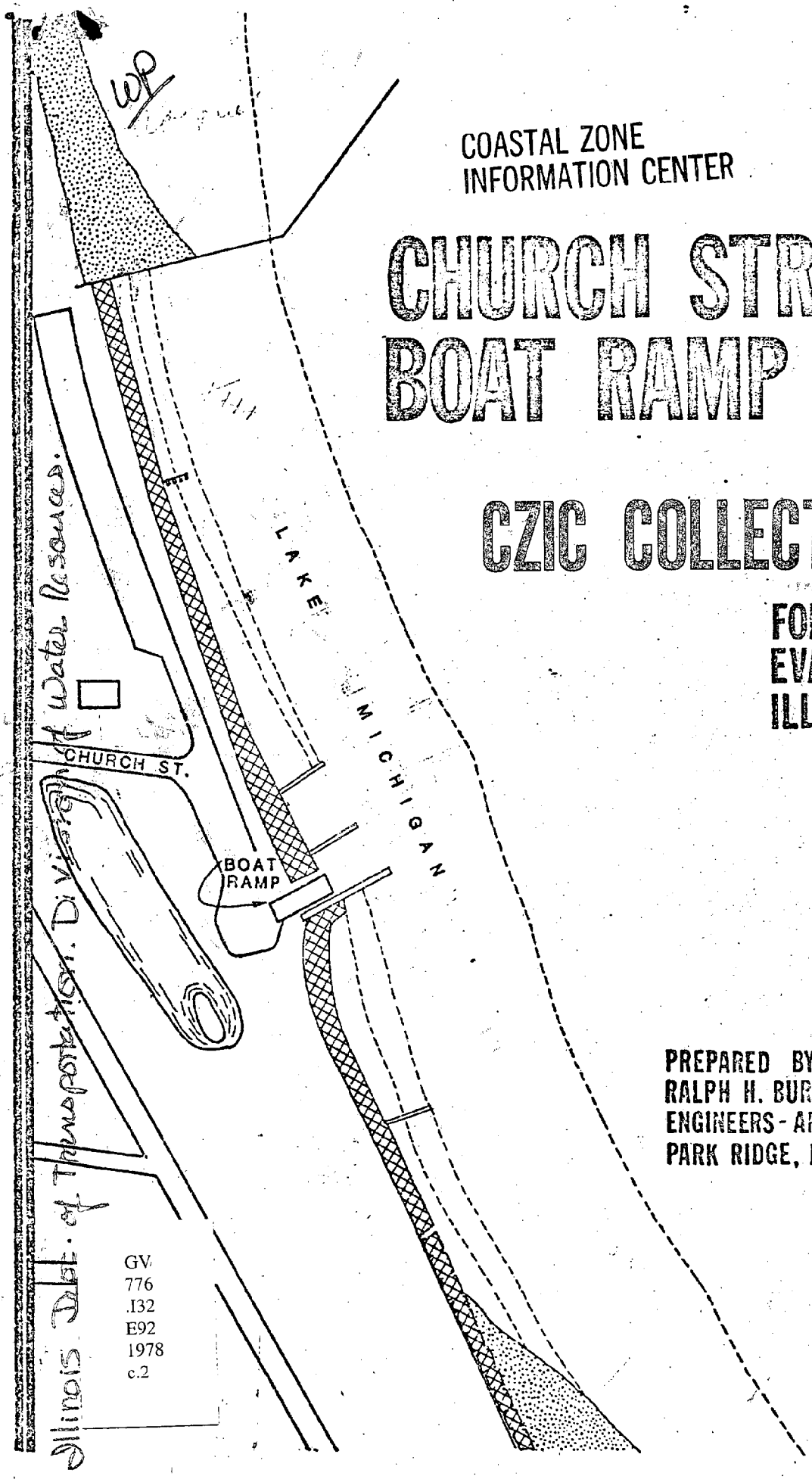

CHURCH STREET BOAT RAMP STUDY

FOR THE CITY OF
EVANSTON,
ILLINOIS

AUGUST, 1978

PREPARED BY
RALPH H. BURKE, INC.
ENGINEERS - ARCHITECTS - PLANNERS
PARK RIDGE, ILLINOIS

CHURCH STREET BOAT RAMP STUDY

FOR THE CITY OF EVANSTON, ILLINOIS

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Director of Parks, Recreation, and Forestry

August, 1978

Prepared by

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Engineers - Architects - Planners
Park Ridge, Illinois

The preparation of this Study was financed in part by the Illinois Department of Transportation, Division of Water Resources, through an Illinois Coastal Zone Management (ICZM) program.

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August, 1978

Honorable Mayor and Members
of the City Council
City of Evanston
Municipal Building
1501 Oak Street
Evanston, Illinois 60201

Gentlemen:

We are pleased to transmit herewith, our final study of the Church Street Boat Ramp for the City of Evanston.

The principal items contained in this study are as follows:

1. Purpose and Background
2. Need for Breakwater Protection
3. Ramp Utilization
4. Lake Bottom Contours in Vicinity of Breakwater
5. Primary Protection Analysis
6. Preliminary Cost Estimate
7. Financing
8. Plan of Action

In addition, there are three figures and eight tables. For convenience the Conclusions and Recommendations are inserted both in the front and at the end of the report.

The principal conclusion of this Study is that some modification to the existing power boat ramp at Church Street and the construction of a protective breakwater are necessary to ensure safe operations of the boat ramp during moderate and severe storms. With some modifications the breakwater could have a dual function by also serving as a fishing pier.

The estimated cost for the above project is $450,000 and as shown in the Study, it appears feasible to finance the project partially with grants in aid from Federal and State funding programs, suggested local share contributions, and financing the remaining amount with proceeds of a short term loan.

It is recommended that the above project be approved and the Plan of Action as it appears in Chapter 8 be implemented by the City of Evanston.

We would be pleased to meet with you to review this Study and answer any questions you might have regarding this Study.

We wish to express our appreciation for the opportunity to continue to serve as your shore protection consultants. We wish to express our thanks to the City Manager and the staff of the Department of Parks, Recreation and Forestry for their valuable assistance during the course of this Study.

Respectfully submitted:

RALPH H. BURKE, INC.
Engineers - Architects - Planners

J. L. Donoghue
President

JLD:LT:kr

Enclosure

Conclusions and Recommendations

1. There is definitely a substantial need to modify the existing Power Boat Launching Ramp at Church Street and to construct a breakwater structure to provide protection for the launching area, considering the threats to life and property that are inherent in severe weather recovery operations with the exposed ramp. From the Church Street Boat Ramp location the two closest protected boat ramps are located in Waukegan Harbor and in Diversey Harbor, each 22 miles north and eight miles south respectively.

2. The demand for use of the Power Boat Ramp at Church Street is apparent, as was indicated by the number of boats launched in previous years which reached a record high of 6,152 in 1959. At present the number of seasonal launchings ranges between 1,500 and 2,000. Many boaters who have used the Power Boat Ramp in the past years have gone elsewhere because of unsafe recovery problems.

3. The construction of a protective breakwater structure will also reduce to a minimum the cost of maintenance for the boat ramp and the pier because they will each be protected from severe lake storms. By constructing the breakwater it is estimated that there will be a saving of some $26,100 in annual Operation and Maintenance costs.

4. The increased usage of the existing Boat Ramp Pier at Church Street by fishermen has been very noticeable during the past several years. With some minor modifications the proposed breakwater could serve a dual purpose as a fishing pier. The breakwater would provide a larger area for fishermen who would not be interferred with by the boaters who must stand at the pier as they are tieing their boats up just after launching or just prior to recovery. The extended length of the pier would make it possible for shore fishermen to cast their lines in deeper water and thus have a greater opportunity to catch fish.

   Fishing appeals to all age groups and it cuts across people of all walks of life. It is a low cost, enjoyable recreation activity that everybody can afford and participate in. With some modifications, as proposed herein, the breakwater could have a dual function by also serving as a fishing pier for the sport fisherman and the sightseeing general public as well.

5. The recommended breakwater solution will be 370 feet long, connected to the shore and will be impermeable in nature. This type breakwater can also serve as a fishing pier. Further analysis in the design phase is recommended to determine whether a Raymond-Concrete Pile type breakwater or an Armco Bin-Wall type breakwater would be more advantageous in the long run for this particular location.

6. Installation of an adjustable pier mounted on steel footings to replace the existing catwalk at the southern groin is recommended. The adjustable pier would permit adjustment of the height of pier to go up or down and match the lake levels. This pier would be stored for the Fall - Winter season. The location of this pier would most likely be more to the south of the existing southern steel groin. In this way it could serve two launching lanes, one on either side, whereas the present catwalk serves only one lane.

7. Downdrift erosion effects caused by the proposed breakwater would be minimal or negligible because it is located in the "shadow" of the Northwestern University landfill. Because of the Northwestern landfill there is very little littoral drift. The shoreline immediately to the south of the proposed breakwater has had riprap or beaches installed previously. Consequently, it is believed that there will be little or no effect. Further, the City of Evanston owns all of the adjoining shoreline both north and south of the proposed breakwater which might be affected by the breakwater. Therefore, there should not be any serious, valid objections raised by nearby riparian owners.

8. The operation of Dempster Street and Church Street Boat Ramps in Evanston shows a cash surplus for the last three years. With the proposed protection and improvements of the Church Street Boat Ramp facility, a substantial increase in utilization of the ramp is anticipated. Because the user fee rates charged by the City of Evanston are lower than those charged by Chicago and the other northern suburbs, it is believed that an increase in launching fee rates could be implemented with little resistance. The preliminary financial analysis of the improved Boat Ramp in Table 5A indicates that a surplus of as high as $20,000 annually could be generated. This surplus could be used for debt service for a short term loan to finance the portion of the project cost which will not be furnished as a grant in aid from federal, state or other local sources.

9. With an increase in utilization of the boat ramp, the existing parking lot may be inadequate during peak periods. The City should consider the following steps to accommodate the increase: nest parking for trailers only; permit to use Northwestern University parking lot; remote parking and shuttle either for trailers only or for trailers and cars; modest expansion of parking lot.

10. The preliminary cost estimate of the proposed breakwater is $450,000. Financing of this project could be sought from the various sources of Federal, State and local grants available for a breakwater and for fishing pier construction. A preliminary recommended financing plan is shown in Table 7. The table listed the following as possible funding sources:

a.	LAWCON (Land and Water Conservation Fund)	$200,000
b.	State of Illinois, Department of Conservation, Boat Access Program	$42,000
c.	Federal Revenue Sharing Fund for the City of Evanston	$45,000
d.	1977 General Obligation Bond Issue for shore protection purposes	$45,000
	Subtotal	$332,000

The balance of $118,000 could be financed with a short term loan from a local bank to be repaid from the operating surplus mentioned above. Other sources for funding to be explored by the City of Evanston are:

Community Development Grant through the Housing and Urban Development Agency; the Federal Government's Accelerated Public Works Act; and donations from foundations, corporations or private donors living in the Evanston area.

11. The recommended Plan of Action to be taken by the City of Evanston:

    a. Send a copy of the Study to the Corps of Engineers and Illinois Department of Conservation for their review and comments on the type and configuration of the breakwater recommended in this Study.

    b. Investigate all the different sources of funding that might be available for this project. Determine which of the sources are most appropriate for this project.

    c. Prepare a specific financing plan for presentation to the City Council.

    d. Obtain the Council's approval for the means of providing the required local share.

    e. When the financing is assured and agreements have been entered into with the appropriate funding agencies, engage a qualified shore protection consulting engineering firm to prepare the necessary permit applications, the detailed plans and specifications for the solicitation of bids by qualified contractors.

    f. Award the construction contract and upon its completion, put the breakwater and fishing pier into use.

1. Purpose And Background

The Evanston Power Boat Ramp which is located at Church Street has no protection from sudden lake storms and the resulting rough water. This lack of protection prevents the ramp from providing better service for Evanston boaters. Many of them have opted to use other better protected ramps in communities which are many miles from Evanston.

The purpose of this Study is to explore and analyze the boat ramp demand and utilization, facilities requirements, different types and configurations of breakwaters, which could provide the required protection, and result in a recommended breakwater design concept with estimates of construction costs, operational and maintenance expenses and projected revenues. A recommended plan of action and suggested financing methods have also been included.

The City of Evanston presently has two boat launching facilities, the Carry-In Boat Ramp at Dempster St. Beach and the Power Boat Ramp at the extension of Church Street. The Carry-In Ramp at Dempster St. Beach was initially constructed in 1954 and is mainly used for launching small sailboats. The Power Ramp was constructed in 1958 and is used for power boats and larger sailboats.

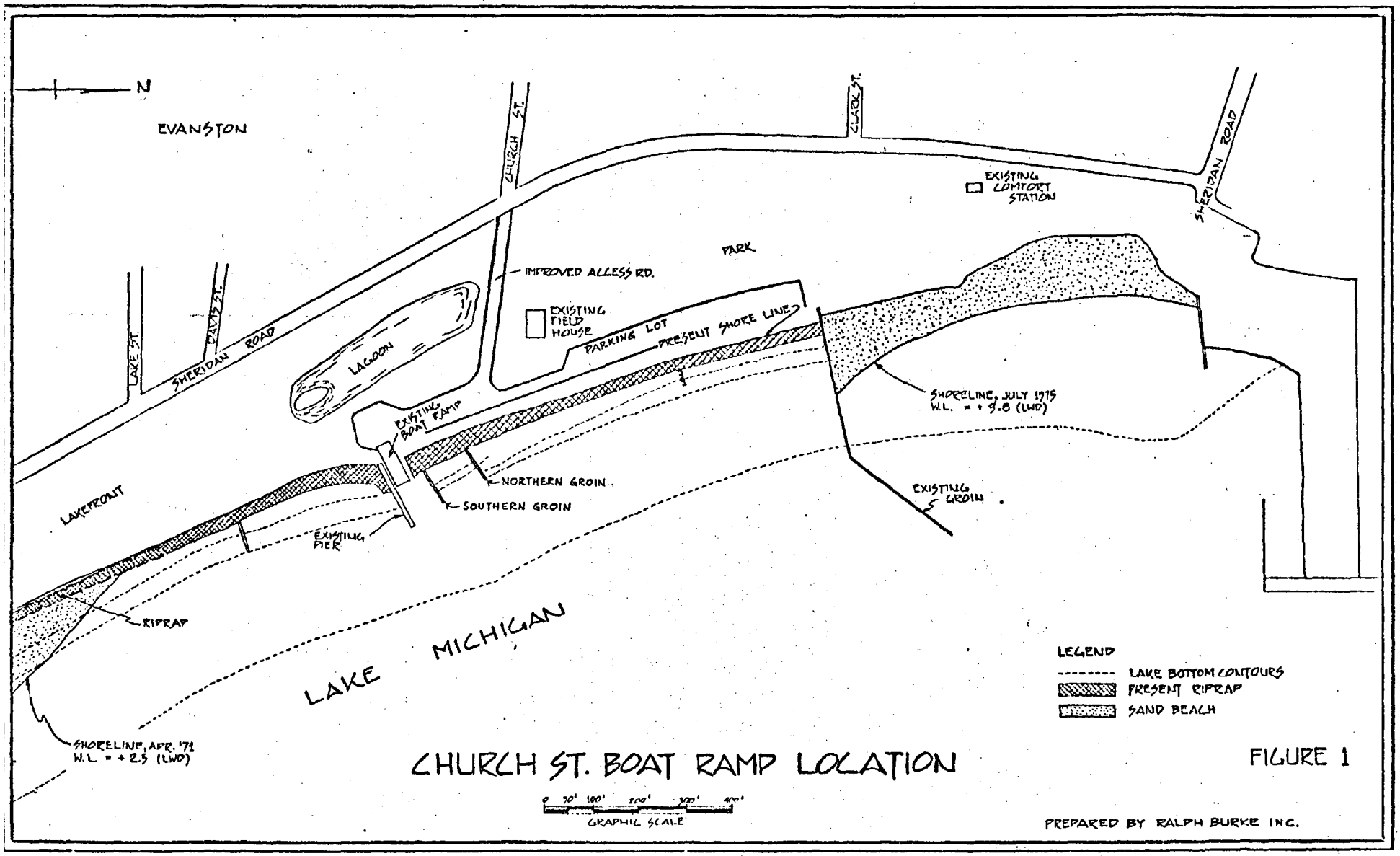
The subject of this Study is the Power Boat Ramp at Church Street extended. A site plan of the Power Ramp is shown in Figure 1. The launching ramp is 40 feet wide, with a precast concrete pier that is located on the south side of the ramp and has a steel grating deck. On the north side of the ramp there are two shorter steel groins, which will be referred to as the northern groin and southern groin in this Study. A catwalk of steel grating is attached to the ramp side of the southern groin. A parking area for the cars and trailers is available farther north along the edge of the park between the Field House and the Clark Street groin. The land side of the Power Ramp provides an area for maneuvering the car and boat trailer for the launching operation and an access road from Sheridan Road. The lake side is open to the lake and completely unprotected from storms.

2. Need For Breakwater Protection

Based on the shortcomings discussed in the following text there is definitely a substantial need to modify the existing Power Boat Launching Ramp facilities at Church Street and to construct a breakwater structure to provide protection for the launching area, considering the threats to life and property that are inherent in severe weather recovery operations with the exposed ramp.

Lake Michigan is a very large body of water. It is the second largest of the five Great Lakes. Lake Michigan is very treacherous in the following respects:

- Frequently lake storms give little warning to boaters. Severe storms can generate in less than 15 minutes.



CHURCH ST. BOAT RAMP LOCATION

FIGURE 1

PREPARED BY RALPH BURKE INC.

- High waves make boating unsafe.

- Boat recovery operations at the Power Ramp are very difficult and dangerous during severe weather because of the lack of any primary protection structure (breakwater). As many as six men are needed to recover a boat during severe weather conditions.

Many boaters have used the Power Ramp in the past years, but have gone elsewhere because of unsafe recovery problems. They do not want to risk damaging their boat or injuring themselves or friends during the boat recovery operation.

At present, when the lake storm gets so bad that boats cannot be recovered at Church Street ramp, a boater has to go either to Waukegan Harbor in the north or Diversey Harbor in the south, where they do have protected boat ramps. However Waukegan Harbor is 22 miles and Diversey Harbor is eight miles from the Church Street ramp, with no other protected boat ramp in-between.

Another alternative for boaters who get caught in the lake storm would be to seek refuge inside Wilmette Harbor or Montrose Harbor until the storm is over and then come back to Church Street ramp to recover their boat. In the meantime they have to go through the ordeal of riding out the storm and getting soaked. Children might fall overboard or get frightened by the lightning and thunder that frequently accompanies the sudden summer storms. The creation of a protected boat ramp area at the Church Street location, with enough space for boats seeking refuge while waiting their turn to recover their boats, would certainly be welcomed by the boaters.

A breakwater structure will serve two important purposes. It will provide protection for the launching area, and it will also reduce the maintenance cost of the existing pier to a minimum because the pier will be protected from severe lake storms. The ramp and pier will also be protected from damage due to storm driven floating ice. In 1972/1973 the City spent approximately $94,000 to replace the broken-up concrete deck of the pier with steel gratings and to install wooden bumpers on the north side of the pier. This year the City is spending approximately $44,000 for the repair of the cracked and displaced precast concrete substructure of the pier, and to add boat bumpers on the south side of the pier.

3. Ramp Utilization

Following is Table 1 which shows the number of registrations and launchings for the Church Street Power Boat Ramp during previous seasons. The number of registrations indicates the number of season pass holders. The number of launchings includes both launchings by season pass holders and transient users.

TABLE 1

BOAT LAUNCHINGS FOR PREVIOUS SEASONS

Year	Launchings	Registrations
1954	336	None
1955	960	45
1956	375	141
1957	1,721	212
1958	2,923	234
1959	6,152	387
1960	5,186	431
1961	5,316	428
1962	3,950	394
1963	3,048	352
1964	2,930	308
1965*	2,132	285
1966*	2,673	301
1967*	2,583	292
1968*	1,843	324
1969	2,318	338
1970	1,955	329
1971	1,640	330
1972	1,447	311
1973**	1,689	340
1974**	1,461	228
1975**	1,934	338
1976**	1,214	316 (12 weeks)
1977**	1,889	353

*Total launchings at the Power Boat Ramp from May 1 thru Labor Day.
**Total launchings at the Power Boat Ramp during official Beach Season only.

The number of boat registrations reached a level above 300 for the first time in the 1959 boating season. This was the first full boating season after the Church Street Power Boat Ramp was constructed. Since then, it has stayed above that level or close to it except in 1974, when we had a fuel shortage it dropped to 228, the lowest it has been since the Power Boat Ramp was opened. In 1975, it quickly rebounded to 338 registrations when it became apparent that boating was not going to be affected by fuel shortages. The record number of registration is 431, reached in 1960. In 1977 the most recent year for which full season records are available, 353 boats were registered.

Table 1 indicates a drop in the number of boats registered in the 1970's compared to the 1960's. This is surprising based on the fact that more Evanston area people own boats now than in the sixties. It is believed that one major reason for the drop in registration is due to the fact that many boat owners use other launching facilities which provide more protection during rough weather and which also have better facilities.

Another factor is that 25% to 30% of the users of the Power Ramp are sailboats (either powered or non-powered) according to the City's Lakefront Director. These sailboats certainly need a protected boat ramp more than the larger power boats do. An improvement of the existing facility and the construction of a protective breakwater would most likely attract more sailboaters and attract back again those boaters who have gone to use other better protected facilities.

The contrast in change of usage in the ramp is more extreme if the number of launchings is analyzed. The number of boats launched reached a record of 6,152 in 1959, the first full season after the Power Boat Ramp was constructed. Since that time it kept declining until it stabilized and ranged between 1,500 and 2,000. This decline in launchings is another indication that Evanston area people have gone to use other boat ramp facilities to launch their boats because of safer conditions elsewhere.

The increased usage of the Boat Ramp Pier at Church Street by fishermen has been very noticeable during the last few years. Fishing appeals to all age groups from children to senior citizens, boys and girls, men and women, and it cuts across people of all walks of life, the poor who fish for food and the rich who fish for the sport or fun of it. It is a low cost, enjoyable recreation activity that everybody could afford and participate in.

Therefore, it is recommended that construction of the proposed breakwater should include consideration of methods of permitting the breakwater to also be utilized as a fishing pier. Then the benefits of the new breakwater would not be for boaters only, but for fishermen and the sight seeing general public as well.

Parking in the boat ramp area is adequate at the present time, except during peak periods, which are usually on busy weekends and holidays. The present parking lot can accommodate approximately 33 cars and trailers.

With an increased usage of the boat ramp, parking at peak periods would be at a premium. Several alternative steps, individually or in combination could be considered by the City of Evanston:

1. "Nest" parking for trailers in small groups. "Nest" parking is accomplished by overlapping a portion of one trailer with an adjoining trailer so as to occupy less ground space.

2. Restrict parking to trailers only, with the cars being parked on the street.

3. Try to get approval to use the Northwestern University parking lot since most of the students are on vacation during the boating season.

4. Utilize a remote parking lot for the cars and trailers, and shuttle the patrons to the boat ramp.

5. Utilize a remote parking lot for the trailers only and bring the cars back to the boat ramp. In some communities, this is done by parking the trailers in Central Business District lots which usually are relatively empty on Sundays and holidays.

6. Provide a modest expansion to the existing parking lot.

Depending on the need, the above step(s) could be instituted for the peak period only or throughout the entire boating season. Patrons utilizing recreation facilities having peak periods tend to redistribute their patronage to avoid peak periods. Consequently, there may be greater use on weekdays, particularly on good weather weekday evenings. The peaks will still occur on the Sundays and holidays when there is beautiful weather. However, the peaks will not be as severe as those which occur when an improved facility is first put into operation. It is suggested that the above alternatives be implemented as required to meet the demand.

4. Lake Bottom Contours in Vicinity of Breakwater

The United States Geological Survey (USGS) charts (1963 and 1972) show that the depth of water at the lakeward end of the Church Street pier is less than six feet. However, the Illinois Coastal Zone Management (ICZM) Map No. 34 indicates a water depth of 11 feet, based on a water level of 580.6 foot International Great Lakes Datum (or +3.8 above Low Water Datum). The ICZM map was compiled in 1975. For purposes of this report, the 11 foot depth from the ICZM map will be used throughout this report.

It should be understood that if the breakwater is to be constructed, accurate soundings of the lake bottom in the vicinity of the breakwater will be required.

5. Primary Protection Analysis

As discussed earlier, the protection of the launch area is primarily needed for recovery operations during lake storm conditions. During periods of rougher water the boaters do not usually want to use the ramp for launching purposes. However, when they are caught on the Lake by a sudden storm, they want to get out of the Lake as fast as possible.

The worst storms come from the north and northeast direction, the east and southeast storms are not as bad as those from the north and northeast.

A primary protection breakwater should meet the following requirements.

a. Provide protection against storms in the order of importance from the north, northeast, east and southeast directions.

b. The breakwater structure should be adequate, most particularly during periods of high lake levels, to withstand the wave forces. It is very important that the structure

will not fail under extreme wave forces or ice action. It is not necessary that the breakwater be fully effective during these extreme conditions. The reason being that boating activities will normally occur when wave heights are two feet or less. Some minor overtopping of the breakwater during recovery operations would not cause serious problems. Severe overtopping during heavy storms, i.e., wave heights of four to five feet or even greater would not be a problem, because it is presumed that boaters would not require the use of the ramp at those times. Obviously, there will be no boating activity during periods that floating ice would be present.

c. For boating safety reasons the top elevation of the breakwater should be such that it will not be obscured by high water levels and consequently be a hazard to navigation at times of high water. From preliminary analysis it appears that the top elevation should be approximately at +8.0 LWD. If the top elevation were higher, it would provide a greater assurance of calmer water behind the breakwater, recognizing that each additional foot of height would add to the cost of construction of the breakwater.

d. The protected area should be adequate for maneuvering both power boat and sail boat traffic and provide tie-up area for refuge during severe weather conditions while other boats are using the ramp for recovery operations.

e. The configuration of the breakwater should be such that a future extension of the breakwater could be accomplished to provide for future expansion of the refuge area.

f. It is desirable to have a breakwater that could also be utilized as a fishing pier, and for sight seeing by spectators.

5.1 Comparative Cost Analysis of Alternative Types of Breakwaters

Various types of primary protection structures have been considered which would suit the Church Street boat ramp facility. Consideration was given to both impermeable and permeable* breakwaters. Following are the types of breakwaters that have been considered.

A. Rubble Mound Breakwater

This type of breakwater is reasonably impermeable and would be permanent in nature. With the approximate lake bottom at -7.0 LWD and the top elevation at +8.0 LWD, the structure would be fifteen feet high. The estimated construction cost of this type of breakwater is $1,000 per lineal foot.

*A permeable breakwater is a breakwater with openings large enough to permit passage of appreciable quantities of littoral drift.

It should be noted that all the costs in this comparative analysis section include only the estimated cost of construction. They do not include allowances for engineering, design fes, inspection of construction, topographic mapping, soundings, testing of materials and other similar related costs and contingencies. These will be included later in the preliminary cost estimate for the recommended concept.

B. Sheet Piling Breakwater and Riprap

This type of breakwater would consist of one row of steel sheet piling with batter piles on the land side, if necessary, to prevent overturning of the sheet piling due to severe storms or ice action. There would also be some riprap placed at the lakeward face of the piling. The purpose of the riprap is to reduce scouring at the face of the sheeting, and minimize wave overtopping of the sheet piling. This type breakwater is impermeable and is permanent in nature. The estimated construction cost is $1,500 per lineal foot.

C. Raymond Concrete Pile Breakwater

This would consist of hollow, cylindrical, precast prestressed concrete piles, 54" in diameter and driven one next to another. The core of the piles would be filled with sand and a 15" thick x 60" wide concrete cap would top the piles. One advantage of this type of breakwater is that the top would be wide enough to also serve as a fishing pier. Some safety devices should be provided, however, to keep people from being swept off the breakwater, as they would be making their way to shore, because of the onset of a sudden storm. Riprap would be placed at the lakeward face of the Raymond piles to reduce scouring. This type of breakwater is practically impermeable and of a permanent nature. Estimated construction cost is $950 per lineal foot.

D. United McGill Floating Breakwater

This would consist of two rows of prefabricated pontoons installed parallel to each other and generally parallel to the shoreline. The structure could be dismantled for the winter. This type of structure is entirely permeable and of a less permanent nature.

According to the United McGill Company technical personnel they have designed a floating breakwater which is adequate for five foot high waves. It has a cost of $250 per lineal foot.

They indicated that for waves higher than five feet, there might be some problems with anchoring of the structure. The Chief Engineer for United McGill indicated that this type of breakwater is not recommended for

eight foot high waves. In Evanston at the Church Street boat ramp site wave heights of nine feet could be expected with severe storms during the boating season and particularly during periods of high lake levels.

If United McGill were to design a floating breakwater suitable for nine foot wave heights, the components would have to be very heavy, the dismantling process for winter would be costly and the total cost would be comparable to the cost of constructing a rubble mound breakwater. Other drawbacks are that repairs to this type of structure will be costly.

In view of the above problems, this type of breakwater was dropped from any further consideration.

E. Scrap Rubber Tire Breakwater

Recent publicity in the local press has been given to this new type of breakwater. It would consist of numerous used automobile rubber tires tied together with chains or steel cables in various configurations. To date there has been only one such installation on an exposed area in Lake Michigan, i.e. at the entrance to Diversey Harbor in Chicago. It was installed in June 1978 by the Chicago Park District. One other such installation is proposed for early construction by the Chicago Park District to protect the entry to Belmont Harbor marina facility.

The cost of this type breakwater is estimated to run between $100 and $200 per lineal foot. The use of this type of breakwater is limited to water areas having only two to three foot waves. For higher waves it is not effective and will probably have the same anchoring problems as the United McGill floating breakwater. It is very hard to determine the maximum anchoring force required for this type breakwater.

This type of breakwater has a potential hazard which would be caused by a tire (or tires) breaking loose and becoming a hazard to a boater or water skier. This could result in considerable liability to the City of Evanston if such an accident were to happen. There may be some problem in getting approval of the State of Illinois from an environmental standpoint. The State is quite strict in insisting that only non-polluting materials be put into the Lake.

It is too early to determine if this type of breakwater has been effective. Several seasons of use will be required to determine the practicality, effectiveness and durability of this type breakwater. Until such time that more scrap tire breakwaters have been installed on open areas of Lake Michigan, and they have been determined to be effective and safe, it appears best to defer consideration of that type of breakwater.

In view of the above, such type of breakwater was dropped from further consideration.

F. Armco Bin-Wall Type Breakwater

This would consist of two parallel Armco bin-walls made of light gauge steel, spaced ten feet apart, and built as compartment units, each ten foot long, and then bolted together on land. The units would be placed in the Lake with cranes and then filled with stones or other suitable fill material. Replaceable wooden bumpers could be installed on the lake side of the bins to keep floating ice from chafing the face of the bin-walls. A concrete cap could then be poured on top of the pier.

Riprap should be placed at the toe of the bin-walls and filter cloth placed underneath the riprap to reduce scouring at the face of the bin-walls. The riprap will minimize wave overtopping of the structure. This type of breakwater is impermeable and is permanent in nature. It has also the advantage that the 10 foot wide concrete cap could serve as a fishing pier similar to the Raymond Concrete Pile type. Estimated construction cost including the bin-walls, the fill, the wood bumpers and the concrete deck is $800 per lineal foot.

G. Summary

Analyzing the various types of breakwaters and through the process of elimination it was determined that Type C - Raymond Concrete Pile Breakwater and Type F - Armco Bin-Wall type are the only two alternatives worth considering. Both types could be utilized as a fishing pier with some modifications to the existing groin.

The analysis was done in the following manner:

Type A - Rubble Mound; the construction cost is comparable to Type C - Raymond Concrete Pile; however, Type A has a higher maintenance cost. Therefore, Type C is the preferred choice of the two concepts.

Type B - Sheet Piling and Riprap; the construction cost is very high and the maintenance cost is also comparatively high and it does not lend itself to use as a fishing pier.

Type D and Type E are impractical.

Type F has an attractive cost per lineal foot and would serve as a fishing pier. The only drawback is that the light gauge steel is believed to have a shorter life than the Type C - Raymond Concrete Pile breakwater.

5.2 Configuration

During the course of the Study, eight different breakwater configurations were evaluated using concepts such as detached from or attached to the shore, parallel to the shore, arrowhead shape, crescent shape, and other various shapes.

The parallel to shore, the crescent and the arrowhead concepts were all detached from the shore. Since it was determined early in the Study that a desirable criteria is to have the breakwater also function as a fishing pier, these "detached from the shore" concepts were discarded.

Consideration was also given to concepts with the breakwater connected to the shore through the southern groin and also to the northern groin. Connections to the southern groin were discarded because they provided less protected area for boat maneuvering and tie-ups during lake storms, especially for sailboats which require more space for maneuvering than do the power boats.

After study and analysis, the configurations were narrowed down to two schemes which are included as Figure 2 and 3 in this Study, with both of them being attached to the shoreline through the existing northern steel groin located about 180 feet to the north of the concrete pier. Both schemes provide ample space in the protected area for boat maneuvering and tie-ups while waiting for access to the ramp during severe lake storms and both have a southerly leg that is parallel to the southeasterly direction. The main difference between the two schemes is that in Scheme 7 the breakwater extends some 110 feet from the lakeward end of the northern groin and thus provides more protected area for boat maneuvering and tie-ups than Scheme 8, which only extends 30 feet from the same point of the northern groin. However, Scheme 7 is also more costly than Scheme 8 because the total length of Scheme 7 breakwater is 370 feet and Scheme 8 breakwater is 340 feet.

Both Schemes anticipate raising the top of the existing northern groin. By raising the height of the existing northern groin and adding a platform on top of it and by adding a concrete deck on top of the breakwater a considerable added advantage would be its use as a fishing pier and spectator area for park patrons enjoying the view of the Lake and boating activity both at the ramp and also out on the open lake.

As indicated earlier, the water is 11 feet deep when the water level is +3.8 LWD. This results in a lake bottom elevation of -7.2 LWD. A preliminary analysis of the wave heights in this area indicates that a top elevation of +8.0 LWD would be required to prevent most of the waves from overtopping. Even at +8.0 LWD, some two to three feet of overtopping would still occur during severe storms and high lake levels with wave heights ranging from four to six feet.

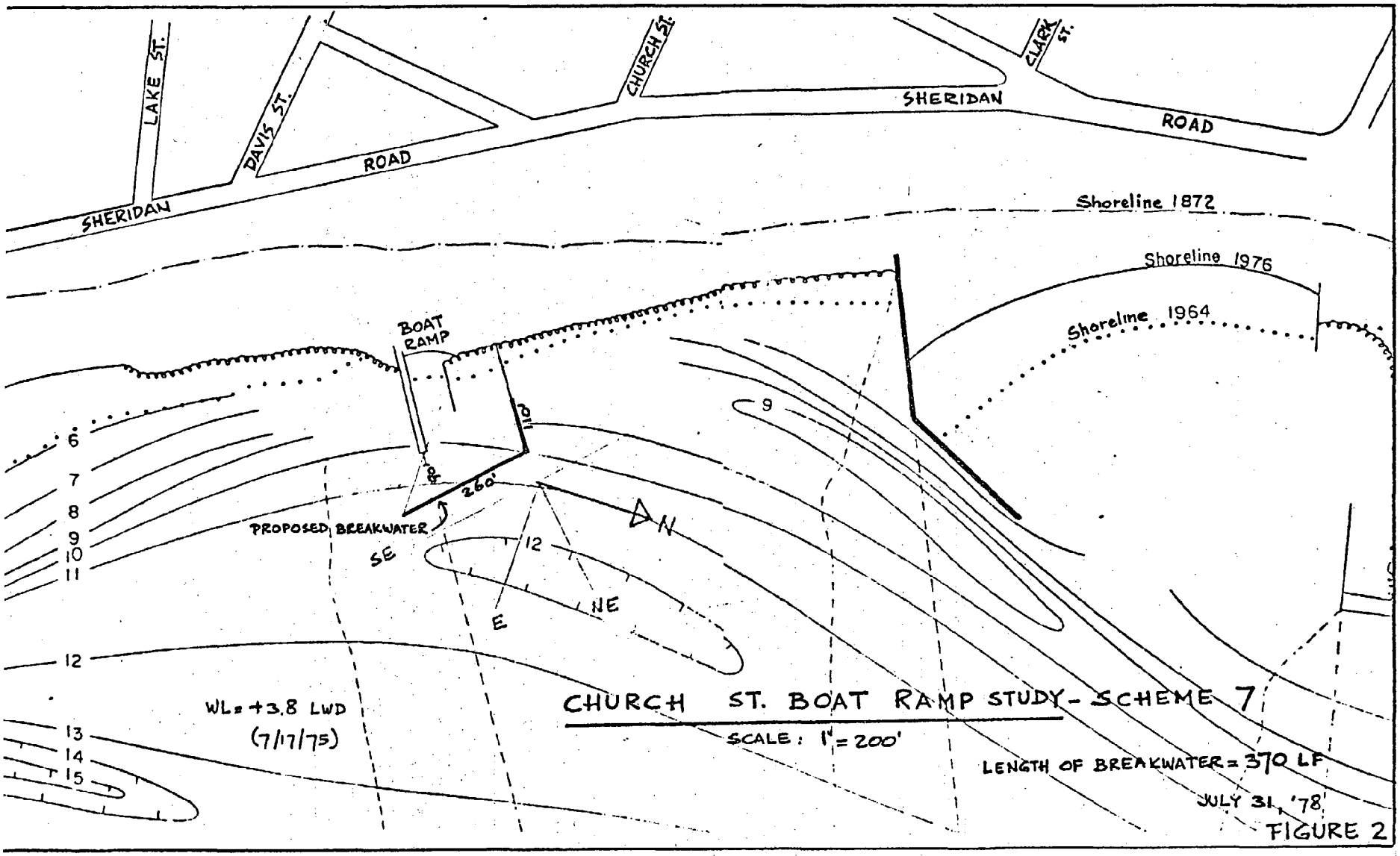
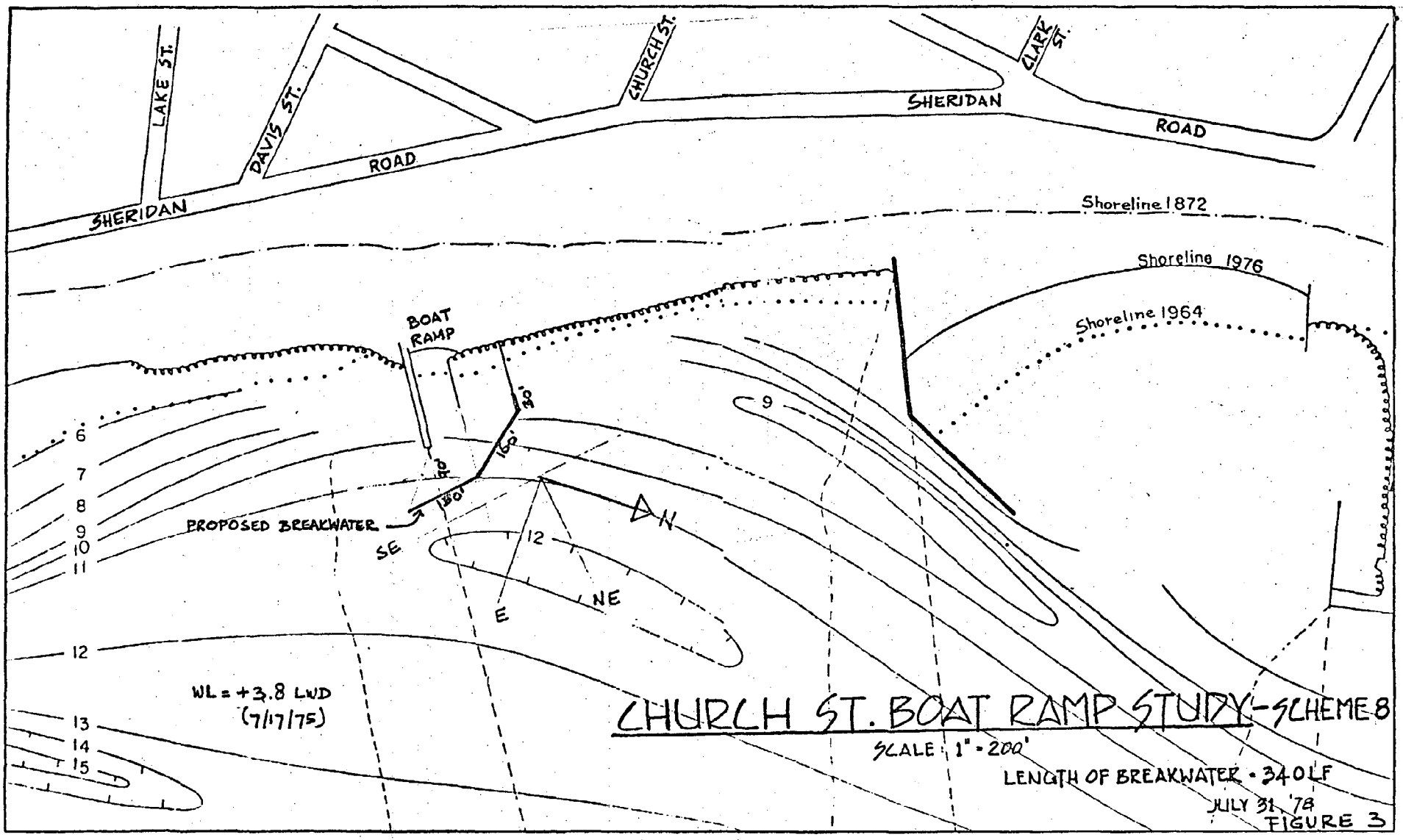

LAKE ST.
DAVIS ST.
CHURCH ST.
CLARK ST.
SHERIDAN ROAD
SHERIDAN ROAD
Shoreline 1872
Shoreline 1976
Shoreline 1964
BOAT RAMP
110'
260'
PROPOSED BREAKWATER
SE
N
NE
E
6
7
8
9
10
11
12
13
14
15
WL = +3.8 LWD
(7/17/75)
CHURCH ST. BOAT RAMP STUDY - SCHEME 7
SCALE: 1" = 200'
LENGTH OF BREAKWATER = 370 LF
JULY 31, '78

FIGURE 2


LAKE ST.
DAVIS ST.
CHURCH ST.
CLARK ST.
SHERIDAN ROAD
SHERIDAN ROAD
Shoreline 1872
Shoreline 1976
Shoreline 1964
BOAT RAMP
PROPOSED BREAKWATER
SE
E
NE
N
6
7
8
9
10
11
12
13
14
15
WL = +3.8 LWD
(7/17/75)
CHURCH ST. BOAT RAMP STUDY - SCHEME 8
SCALE: 1" = 200'
LENGTH OF BREAKWATER = 340 LF
JULY 31, '78
FIGURE 3

During lake storms small sand particles from the lake bottom will be in suspension in the water and as the waves overtop the breakwater it will carry the sand and deposit it on the shore side of the breakwater. Thus some silting could be expected for both Schemes, though minimal, and dredging could be expected to be required every five to seven years.

Because both Schemes are connected to the shore and are impermeable in nature, provision should be made in the engineering plans to provide a means of water circulation through the breakwater. The water circulation would have a cleansing effect and prevent entrapment of debris behind the protective breakwater structure.

5.3 Raising of Southern Groin

The existing catwalk attached to the southern steel groin needs some modification to achieve a more suitable catwalk. The boaters in the past have often had to wade their way along the existing catwalk, which is under water during periods of high lake levels or during minor storms.

A catwalk with an adjustable height is needed to accommodate the varying season to season lake levels. This could be accomplished by welding an angle vertically to the sheet piling. Because the grating platform and its supporting structure are removable, by providing holes in the welded vertical angle, the height of the platform could also be adjusted from season to season.

Another alternative would be to install an adjustable pier on steel footings which would permit the pier to be adjusted up or down with the lake levels. This adjustable pier would then be stored for the Fall-Winter season. The location of this adjustable pier would most likely be more to the south of the existing one so it could serve two launching lanes, whereas the present catwalk serves only one lane.

5.4 Comparative Estimates of Operational and Maintenance Expenses for the Breakwater

Costs of Operation and Maintenance (O & M) for the Raymond Concrete Pile Type and the Armco Bin-Wall Type would be low for both types, with the Armco Bin-Wall on the higher side because of the wooden bumper and possible replacement of parts of the bin-wall. Estimated cost for replacement of wooden bumper and bin-wall is $1,500 annually.

Both type breakwaters need some replacement of riprap during the period of high lake levels, estimated at 5% of construction cost, say $2,700 annually.

Dredging requirement for both types as discussed in an earlier paragraph would be very minimal, probably $5,000 to $7,000 once every five to seven years. Annually it would be about $1,000.

Total estimated O & M cost is $3,700 for the Raymond Concrete Pile type and $5,200 for the Armco Bin-Wall type.

Following is a tabulation of estimated O & M costs present and future.

TABLE 2

O & M Cost for:	Present	Future
a. Ramp	$29,300	$10,000
b. Pier	16,000*	3,000
c. Groins	N.A.	1,000
d. Breakwater	N.A.	4,200**
e. Dredging	N.A.	1,000
Total	$45,300	$19,200

* The repair and modification of the pier was done in 1972 for $94,000. Average annual cost from 1972 until 1978 is $94,000 ÷ 6 = $15,700, say $16,000.

** for Bin-Wall type

The present O & M cost for the ramp is as follows:

From the 1978 Annual Lakefront Report, the O & M cost for 1977 shown is $14,400. It includes $3,000 charged back by the Parks Department for maintenance services (labor cost only). The Parks Department actually spent $17,908 for maintenance of the Power Boat Ramp in labor cost. Cost of material is generally charged directly to the boat ramp operation. Total actual annual O & M cost for the Power Boat Ramp is $29,308, of which approximately $5,500 was operational cost, e.g. salaries, permits, supplies, etc., and the remaining $23,808 was for maintenance and repairs of boat ramp damaged due to lack of protection from lake storms.

The future O & M cost for the ramp is estimated as follows:

With the proposed breakwater protection and other improvements it is believed that the maintenance cost could be reduced to as low as $4,500.

Operational costs for salaries, permits, supplies, etc.	$5,500
Maintenance Cost	4,500
Estimated Annual O & M Cost	$10,000

Based on the above analysis it is determined that a saving of $26,100 in O & M cost is possible with the construction of a new breakwater.

5.5 Downdrift Erosion Effects

The downdrift erosion effects under Type C (Raymond Concrete Pile) and Type F (Armco Bin-Wall) will be minimal and about the same for both types because of the location of the Church Street boat ramp. It is located between the Northwestern University Landfill to the north and the Dempster Street groin to the south, two prominent structures that extend far into the lake. Littoral drift in the boat ramp area is very minimal, because it is in the "shadow" of the N. U. landfill.

It should be noted that the City owns all of the property abutting the shoreline between the N. U. landfill and the Dempster Street groin. All of this shoreline has had riprap or beaches installed previously. Therefore, the downdrift erosion effects caused by the proposed breakwater would be minimal or negligible.

5.6 Revenue

The revenue analysis for the Church Street Power Boat Ramp for the past three years is as follows:

TABLE 3

	1975	1976	1977
Revenue	$10,781	$10,830	$13,010
Expenditures	N.A.	N.A.	$14,403*

*This figure does not include an additional $14,908 in maintenance services provided by the Parks Department not charged to the boat ramp operation.

N.A. = Not Available

The revenue in 1977 indicates an increase of 20% over 1976, and very close to break-even, which is a healthy sign. The increased revenue was primarily due to an increase in non-resident season registrations. However, if the statistics of the Carry-In Boat Ramp at Dempster Street Beach are combined with the Church Street Power Boat Ramp, it shows a more favorable picture.

TABLE 4

	1975	1976	1977
Total Revenue (Dempster & Church)	$17,346	$17,039	$21,521
Total Expenditure (Dempster & Church)	$10,487	$10,759	$19,193*
Surplus	$6,859	$6,290	$2,328

Although there is a jump in expenditures of about 78% over 1976, the total revenue is higher than the expenditures. It should be noted that the large increase recorded in expenditures is mainly due to a different accounting system employed in 1977.

The sources of the above revenue Tables and other revenue data are the 1978 Annual Lakefront Report and City of Evanston Park officials.

For comparison purposes, the following Table 5 is a summary of user fee rates for 1978 charged by the different boat launching facilities in the Chicago and northern suburb areas.

TABLE 5

	BOAT RAMP LOCATION					
User Fees	Chicago	Evanston	Winnetka	Highland Park	Lake Forest	Waukegan
1. Season fee for						
a. resident	$40	$35	$60	$37	$60	N.A.
b. non-resident	40	45	96	59	85	N.A.
2. Daily fee for						
a. resident	N.A.	$7.50	N.A.	N.A.	N.A.	N.A.
b. non-resident	N.A.	10	N.A.	N.A.	N.A.	N.A.
c. weekdays	$5	N.A.	$6	$4	N.A.	$3
d. weekends	5	N.A.	12	5	N.A.	3

N.A. = Not Applicable

Notes:

1. The user fee charged by the Waukegan Port Authority is exceptionally low because the boat ramp was partially funded by the State of Illinois Department of Conservation. The Department's policy is to require low user fees for facilities financed with their funds.

2. The boat ramps in Chicago and Waukegan are protected, while the ones in Evanston, Winnetka, Highland Park and Lake Forest are not.

The above Table indicates that the present season user fee rates charged by the City of Evanston for launching boats is less than those charged at Winnetka, Highland Park, Lake Forest and Chicago (for season fee for residents). With an improved facility and a protective breakwater, it is believed that the City could raise the launching fees with little resistance. The increase in user fees is recommended to help repay the cost of past repairs and to partially offset the cost of the breakwater.

It is noted that Evanston is the only community charging a different daily rate for resident and non-resident transient use of their boat ramps. All the other communities charge the same rate for residents and non-residents daily use, with some of them charging a lower rate on weekdays and a higher rate on weekends. The latter concept seems more appropriate. There is another benefit to this user rate concept. It also permits better revenue control. This is because of the need to only verify the number of uses of the ramp without having to confirm whether or not the user was a resident.

The improved conditions with the breakwater should permit the users fees to be adjusted upward to reflect the substantial improvements which will be provided. For the purpose of this preliminary analysis, it has been assumed that the resident season fee will be raised to $60 to match the current Winnetka rates for a ramp which has no protection. It has also been assumed that the non-resident season fee will be raised to $90. This is slightly less than the Winnetka $96 non-resident fee.

It has further been assumed that the superior facilities will reattract Evanston residents in quantities similar to, and even higher than the highest numbers recorded when the power ramp was first opened in 1959 and 1960. In 1960 a peak total of 431 season permits were sold. This number began declining in later years when the ramp patrons found out that there was considerable hazard in using the ramp for recoveries during periods of rough water. With the improved conditions, it is believed that a total of 450 season passes can be achieved. During 1977, the non-resident permits for the Evanston ramp amounted to 55% of the total permits sold. Because of the greater increase in permit fees proposed for non-resident permits, it has been assumed that the non-residents will account for only 50% of the total season permits sold.

It is further assumed that the present daily rates would be changed to match the present rates charged at the Winnetka boat ramp, namely $6 for weekdays, and $12 for weekends.

Based on the above assumptions it is now possible to prepare an estimate of the total revenue which might be generated by the improved boat ramp. Table 5A contains this analysis.

TABLE 5A

Preliminary Financial Analysis of Improved Boat Ramp

Season Permit	Estimated Number	Rate	Revenue	Totals
a. Residents	250	$60	$15,000	
b. Non-Residents	250	90	22,500	
Subtotal				$37,500

TABLE 5A (Cont'd)

Season Permit	Estimated Number	Rate	Revenue	Totals
Transient Uses				
a. Weekday	50	6	300	
b. Weekend	100	12	1,200	
Subtotal				$1,500
Grand Total				$39,000
Less Estimated Cost of Operation and Maintenance (From Table 2)				19,200
Surplus Available to pay City of Evanston's Non-Funded Portion of Project Cost				$19,800

Table 5A indicates that an annual surplus of approximately $20,000 could be generated by the improved boat ramp. This surplus could be used for debt service for a short term loan to finance the portion of the project cost which will not be furnished as a grant in aid from federal, state or other local sources. The details of the financing program appears in a later portion of this text.

5.7 Coordination with Cognizant Agencies

A copy of this Boat Ramp Study in final form should be submitted to the Corps of Engineers and the Illinois Department of Conservation for review and comments with subsequent meetings arranged toward the realization of this Study's recommendation.

5.8 Recommended Breakwater Solution

Following is Table 6 comparing the two breakwater concepts discussed in paragraph 5.1 in terms of their effectiveness, comparative costs of construction, operation and maintenance, downdrift erosion effects and estimated life. Acceptability to the Corps of Engineers and the Illinois Department of Conservation will not be known until both agencies would have a chance to review the Study and make their comments.

Each of the two types of breakwater was rated on a scale ranging from 0 to 100 in each of the characteristics mentioned above. A score of 100 for a characteristic is considered perfect.

TABLE 6

	Characteristic	Type C (Raymond Pile)	Type F (Armco Bin-Wall)
1.	Effectiveness as a breakwater	70	80
2.	Construction Cost	60	70
3.	Operation and Maintenance Cost	90	70
4.	Utilization as a fishing pier	80	90
5.	Total Boat Shelter Area protected by breakwater	90	90
6.	Downdrift Erosion Effects	80	80
7.	Estimated Life	80	50
	Total Points Scored	550	530

The Table above indicates that both types of breakwater scored nearly the same points and since the Bin-Wall type costs $800 per lineal foot compared to $950 for the Raymond Pile, it is obvious that cost-wise the Bin-Wall type is more desirable. However, the Bin-Wall type is made of light gauge steel and therefore the Raymond Pile type is believed to have a longer estimated life and also a lower maintenance cost. It is therefore recommended that further analysis be made in the design phase to determine which type of breakwater is more advantageous in the long run.

The configuration in Scheme 7 (see Figure 2) provides more protected area than Scheme 8 (Figure 3) and thus more room for boat maneuvering and tie-up during lake storms. Although it would cost a little more than Scheme 8, it is believed that Scheme 7 is worth the additional cost considering the high percentage of sailboats using the Church Street Boat Ramp. The sailboats require more maneuvering room.

It is therefore recommended that either a Bin-Wall type or a Raymond Pile type breakwater, 370 feet long and with a configuration as shown in Figure 2 be constructed in Lake Michigan to provide a protected area for boat recovery during lake storms and would also serve as a fishing pier.

It is further recommended that the existing northern steel groin, to which the new breakwater would be attached, be modified by raising the top and providing a deck across the top to serve as a fishing pier. Raising of the catwalk attached to the southern pier or replacement with a new adjustable pier should also be undertaken as part of the modification to the existing boat ramp facility.

6. Preliminary Cost Estimate

A. Breakwater Cost Estimate

1.	Steel Bin-Wall 10' wide x 15' high (average) x 370' long		
	Installed cost, say	=	$175,000
2.	Fill Material 2,100 C.Y. @ $18/C.Y.	=	37,800
3.	Riprap and Filter Cloth 1,200 Tons @ $45/Ton	=	54,000
4.	Wood Bumpers 750 L.F. @ $10/L.F.	=	7,500
5.	Concrete Deck 3,700 S.F. @ $3.50/S.F.	=	13,000
	Estimated Construction Cost	=	$287,300

B. Raising of Northern Groin and Construction of Steel Grating Deck On Top of the Groin Cost Estimate

This work is needed to attach the breakwater to the shore.
Estimated Construction Cost = 120 L.F. @ $450/L.F. = $54,000

C. Southern Groin

Alternate 1 -

Construction Cost for Raising the Catwalk attached to the Southern Groin is estimated at 100 L.F. @ $300/L.F. = $30,000 or

Alternate 2 -

Construction Cost for Replacing the Catwalk with a New Adjustable Pier is estimated at 100 L.F. @ $350/L.F. = $35,000

It is recommended that Alternate 2 be implemented, because of lower maintenance cost in the long run. It will be easier to adjust Alternate 2 for varying levels of the Lake. There is a need to adjust the dock level as the lake level fluctuates from season to season.

Estimated Total Construction Cost A + B + C2	=	$376,300
Estimated Engineering Fee (Topo, Soundings, Borings, Design, Specification, Resident Inspection, materials testing, etc.)	=	37,600
Allowance for Contingencies	=	36,100
Estimated Total Cost		$450,000

7. Financing

7.1 Grants

Because the breakwater recommended in this Study will also serve as a fishing pier, grants for a breakwater and a fishing pier project should be sought. Following is a list of various sources of Federal, State and local grants that would possibly be available to fund the recommended plan.

a. The Church Street Boat Ramp is located approximately 22 miles from Waukegan Harbor and eight miles from Diversey Harbor, the two nearest harbors of refuge with a protected boat launching ramp. An application for Federal funding through the U.S. Army Corps of Engineers for this type of project under Section 103 of the River and Harbor Act is a possibility and was explored. However, according to the Chief Planner at the Chicago District, U.S. Army Corps of Engineers, the funding would apply only to harbors of refuge with permanent moorings.

b. The Land and Water Conservation Fund (LAWCON) through the Office of Conservation Services, Illinois Department of Conservation, provides grants for development projects such as a fishing pier. If approved, LAWCON would reimburse 50% of the total project cost with a $200,000 ceiling on the amount of State participation.

   It may be hard to secure the LAWCON Funds because they are highly sought by other communities in Illinois and in the nation. The fact that the City of Evanston is currently receiving an estimated $450,000 from LAWCON for Lovelace Park in Evanston may prevent the City getting such a large grant shortly after the Lovelace Park grant.

c. Another grant source from the Illinois Department of Conservation is under the Boat Access Program. This is a State funding program and such funds can be used for construction of boat ramps, their parking facilities, piers and possibly also breakwater protection.

d. A Community Development Grant through the Housing and Urban Development Agency is another possible source to investigate.

e. Funding through Federal Revenue Sharing funds is yet another source. The City could be asked to apportion for this project some part of the revenue sharing funds received from the Federal Government.

f. The Federal Government's Accelerated Public Works Act is another possible source of 100% grants. All previously appropriated funds have been expended or committed. However, a new appropriation is now being considered by Congress.

g. It is also recommended that the Federal funding coordinator for the City of Evanston look for other sources of grants in aid that are not listed above.

7.2 Local Share

The City of Evanston's share of the development cost or part of it, could be obtained from the general obligation bonds previously authorized to create a substantial operating surplus, and designated for shore protection.

If the users fees were set high enough, it might be possible to use revenue bonds. It might also be possible to borrow the money from a local bank as a short term note and repay it from the operating surplus.

Other sources would be donations from foundations, corporations, or private donors living in the Evanston area.

7.3 Preliminary Recommended Financing Plan

Because of the numerous sources of grants in aid available to the City of Evanston, there are many different ways the breakwater and fishing pier project could be financed. In an effort to assist the City Council and the City staff personnel, the following preliminary financing plan has been prepared. It is recognized that each of the dollar amounts are subject to adjustments depending upon the number of requests being made by other municipalities and the amounts of funds available at the time the request is submitted by the City of Evanston. It must be recognized that such an analysis is speculative in regard to any particular single source of funding. However, when viewed collectively, such an analysis is a reasonably accurate method of determining the amount of money which will probably have to be provided by the City of Evanston by its various alternative sources of funding. Table 7 contains the preliminary recommended financing plan.

TABLE 7

Preliminary Recommended Financing Plan

Estimated Total Project Cost		$450,000
Possible funding sources:		
Federal		
LAWCON funds	$200,000	
State of Illinois		
Department of Conservation Boat Access Program Adjustable pier including engineering fees and contingencies	$42,000	

TABLE 7 (Cont'd)

City of Evanston

Federal Revenue Sharing assume 10% project cost	$45,000	
1977 General Obligation Bond Issue for shore protection purposes	$45,000	
Subtotal		$332,000
Balance to be financed with a short term loan		$118,000

The earlier analysis in Section 5.6 indicated that if user rates were raised to approximate the rates now charged in Winnetka, an annual surplus of approximately $20,000 might be generated. Such a surplus is sufficient to retire a debt of $118,000 in a period of 8 years based on an interest rate of 8 percent.

Such a debt service capability indicates that this proposed breakwater and fishing pier project is financially feasible from a preliminary analysis basis, assuming that the various suggested sources of funding provide grants generally in the amounts indicated above.

It must be recognized that none of the suggested funding sources has received a request for aid from the City of Evanston. Therefore, the actual funding program will be dependent upon the submittal of suitable requests for aid to determine the amount of grants in aid funds which will be made available for the proposed breakwater and fishing pier project.

8. Plan of Action

Following is the proposed plan of action to be taken by the City of Evanston:

a. Send a copy of the Study to the Corps of Engineers and Illinois Department of Conservation for their review and comments on the type and configuration of the breakwater recommended in this Study.

b. Investigate all the different sources of funding that might be available for this project. Determine which of the sources are most appropriate for this project. The Federal funding coordinator for the City of Evanston should look into all Federal grants available for this type of project and assess their feasibility.

c. Prepare a specific financing plan for presentation to the City Council.

d. Obtain the Council's approval for the means of providing the required local share.

e. When the financing is assured and agreements have been entered into with the appropriate funding agencies, engage a qualified shore protection consulting engineering firm to prepare the necessary permit applications, the detailed plans and specifications for the solicitation of bids by qualified contractors.

f. Award the construction contract and upon its completion, put the breakwater and fishing pier into use.

Conclusions and Recommendations

1. There is definitely a substantial need to modify the existing Power Boat Launching Ramp at Church Street and to construct a breakwater structure to provide protection for the launching area, considering the threats to life and property that are inherent in severe weather recovery operations with the exposed ramp. From the Church Street Boat Ramp location the two closest protected boat ramps are located in Waukegan Harbor and in Diversey Harbor, each 22 miles north and eight miles south respectively.

2. The demand for use of the Power Boat Ramp at Church Street is apparent, as was indicated by the number of boats launched in previous years which reached a record high of 6,152 in 1959. At present the number of seasonal launchings ranges between 1,500 and 2,000. Many boaters who have used the Power Boat Ramp in the past years have gone elsewhere because of unsafe recovery problems.

3. The construction of a protective breakwater structure will also reduce to a minimum the cost of maintenance for the boat ramp and the pier because they will each be protected from severe lake storms. By constructing the breakwater it is estimated that there will be a saving of some $26,100 in annual Operation and Maintenance costs.

4. The increased usage of the existing Boat Ramp Pier at Church Street by fishermen has been very noticeable during the past several years. With some minor modifications the proposed breakwater could serve a dual purpose as a fishing pier. The breakwater would provide a larger area for fishermen who would not be interferred with by the boaters who must stand at the pier as they are tieing their boats up just after launching or just prior to recovery. The extended length of the pier would make it possible for shore fishermen to cast their lines in deeper water and thus have a greater opportunity to catch fish.

   Fishing appeals to all age groups and it cuts across people of all walks of life. It is a low cost, enjoyable recreation activity that everybody can afford and participate in. With some modifications, as proposed herein, the breakwater could have a dual function by also serving as a fishing pier for the sport fisherman and the sightseeing general public as well.

5. The recommended breakwater solution will be 370 feet long, connected to the shore and will be impermeable in nature. This type breakwater can also serve as a fishing pier. Further analysis in the design phase is recommended to determine whether a Raymond-Concrete Pile type breakwater or an Armco Bin-Wall type breakwater would be more advantageous in the long run for this particular location.

6. Installation of an adjustable pier mounted on steel footings to replace the existing catwalk at the southern groin is recommended. The adjustable pier would permit adjustment of the height of pier to go up or down and match the lake levels. This pier would be stored for the Fall - Winter season. The location of this pier would most likely be more to the south of the existing southern steel groin. In this way it could serve two launching lanes, one on either side, whereas the present catwalk serves only one lane.

7. Downdrift erosion effects caused by the proposed breakwater would be minimal or negligible because it is located in the "shadow" of the Northwestern University landfill. Because of the Northwestern landfill there is very little littoral drift. The shoreline immediately to the south of the proposed breakwater has had riprap or beaches installed previously. Consequently, it is believed that there will be little or no effect. Further, the City of Evanston owns all of the adjoining shoreline both north and south of the proposed breakwater which might be affected by the breakwater. Therefore, there should not be any serious, valid objections raised by nearby riparian owners.

8. The operation of Dempster Street and Church Street Boat Ramps in Evanston shows a cash surplus for the last three years. With the proposed protection and improvements of the Church Street Boat Ramp facility, a substantial increase in utilization of the ramp is anticipated. Because the user fee rates charged by the City of Evanston are lower than those charged by Chicago and the other northern suburbs, it is believed that an increase in launching fee rates could be implemented with little resistance. The preliminary financial analysis of the improved Boat Ramp in Table 5A indicates that a surplus of as high as $20,000 annually could be generated. This surplus could be used for debt service for a short term loan to finance the portion of the project cost which will not be furnished as a grant in aid from federal, state or other local sources.

9. With an increase in utilization of the boat ramp, the existing parking lot may be inadequate during peak periods. The City should consider the following steps to accommodate the increase: nest parking for trailers only; permit to use Northwestern University parking lot; remote parking and shuttle either for trailers only or for trailers and cars; modest expansion of parking lot.

10. The preliminary cost estimate of the proposed breakwater is $450,000. Financing of this project could be sought from the various sources of Federal, State and local grants available for a breakwater and for fishing pier construction. A preliminary recommended financing plan is shown in Table 7. The table listed the following as possible funding sources:

a.	LAWCON (Land and Water Conservation Fund)	$200,000
b.	State of Illinois, Department of Conservation, Boat Access Program	$42,000
c.	Federal Revenue Sharing Fund for the City of Evanston	$45,000
d.	1977 General Obligation Bond Issue for shore protection purposes	$45,000
	Subtotal	$332,000

The balance of $118,000 could be financed with a short term loan from a local bank to be repaid from the operating surplus mentioned above. Other sources for funding to be explored by the City of Evanston are:

Community Development Grant through the Housing and Urban Development Agency; the Federal Government's Accelerated Public Works Act; and donations from foundations, corporations or private donors living in the Evanston area.

11. The recommended Plan of Action to be taken by the City of Evanston:

    a. Send a copy of the Study to the Corps of Engineers and Illinois Department of Conservation for their review and comments on the type and configuration of the breakwater recommended in this Study.

    b. Investigate all the different sources of funding that might be available for this project. Determine which of the sources are most appropriate for this project.

    c. Prepare a specific financing plan for presentation to the City Council.

    d. Obtain the Council's approval for the means of providing the required local share.

    e. When the financing is assured and agreements have been entered into with the appropriate funding agencies, engage a qualified shore protection consulting engineering firm to prepare the necessary permit applications, the detailed plans and specifications for the solicitation of bids by qualified contractors.

    f. Award the construction contract and upon its completion, put the breakwater and fishing pier into use.