

OLCOTT HARBOR, NEW YORK

Preliminary Alternatives

Introduction: Olcott Harbor is located on the southern shore of Lake Ontario at the mouth of Eighteenmile Creek within the small hamlet of Newfane, New York. The harbor is situated about 18 miles east of the mouth of the Niagara River. The existing Federal project was authorized by the River and Harbor Act of 1913 and provides for parallel jetties (officially called piers at this harbor) at the creek mouth located 200 feet apart. The East and West Piers are 850 and 873 feet long with a crest elevation of +6 and +7 feet Low Water Datum (LWD), respectively. The project also includes a 12- foot deep, 140-foot wide entrance channel extending lakeward for the shore ends of the piers to the -12 foot LWD contour in Lake Ontario. Figure 1 presents 1988 to 1990 bathymetric information along with a vicinity and locality map. Figure 2 presents a 1986 aerial photograph of the harbor.

The piers help shelter the entrance to the harbor from westerly and easterly waves but offer little protection from northwesterly to northeasterly waves. Waves from these directions travel unimpeded into the lower reaches of 18 Mile Creek which is the location of several marinas and other water based operations. It is reported that adverse wave conditions from these directions have caused damage to boats and facilities and have impeded development of the harbor. Local residents also report that boating in the entrance is frequently more difficult than in the open lake. During the hydraulic model study of the harbor, Bottin (1990) measured wave heights exceeding 6 feet between the piers and above 3 feet in height at the south end of the East Pier for the 20-year wave during all seasons of the year. The accompanying 2002 aerial photo of the harbor illustrates waves entering the harbor from the northeast.



In order to correct the unacceptable wave climate that occurs between the piers and within the harbor, several alternatives are presented. It should be noted that the alternatives are conceptual and will require additional engineering and environmental studies to ascertain their viability, appropriate dimensions, orientations and affect upon littoral processes.

Alternatives:

Plan 1: 750-Foot Long Rubblemound Offshore Breakwater - This plan would provide a high degree of protection for all wave directions. The centerline of the breakwater would be placed approximately 350 ft. lakeward of the existing piers. The typical cross-section for the structure was based upon previous investigations (USAED Buffalo 1992). A structure crest would be established at +14.5 feet LWD, with 1V:2H side slopes, except for 100-feet at the ends, which would slope at 1V:2.5H. The entrance channel would be realigned, allowing boat traffic a choice of approach directions dependent on wave and wind conditions. Due to shallower water depths to the west, that channel shall be dredged to -8 feet LWD, while the eastern channel shall be dredged to the presently authorized depth of -12 feet LWD. Figures 3 and 4 present the plan and typical cross-section.

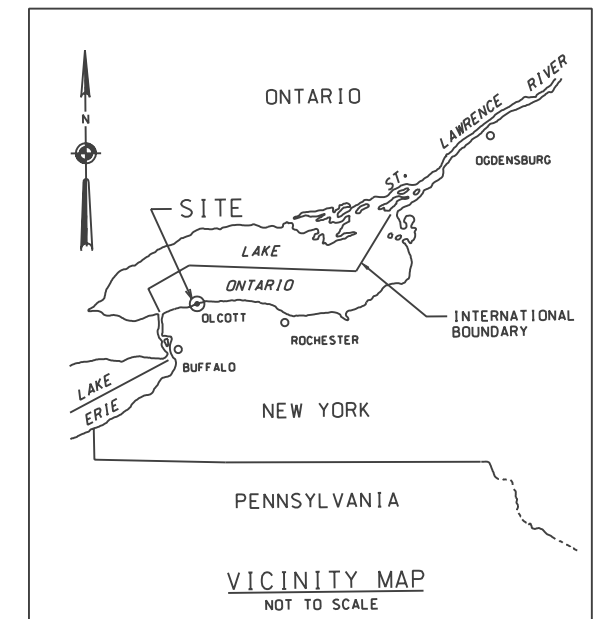
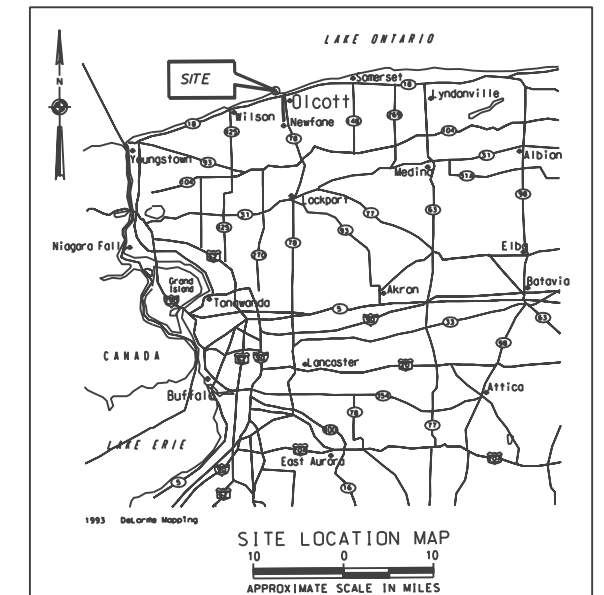
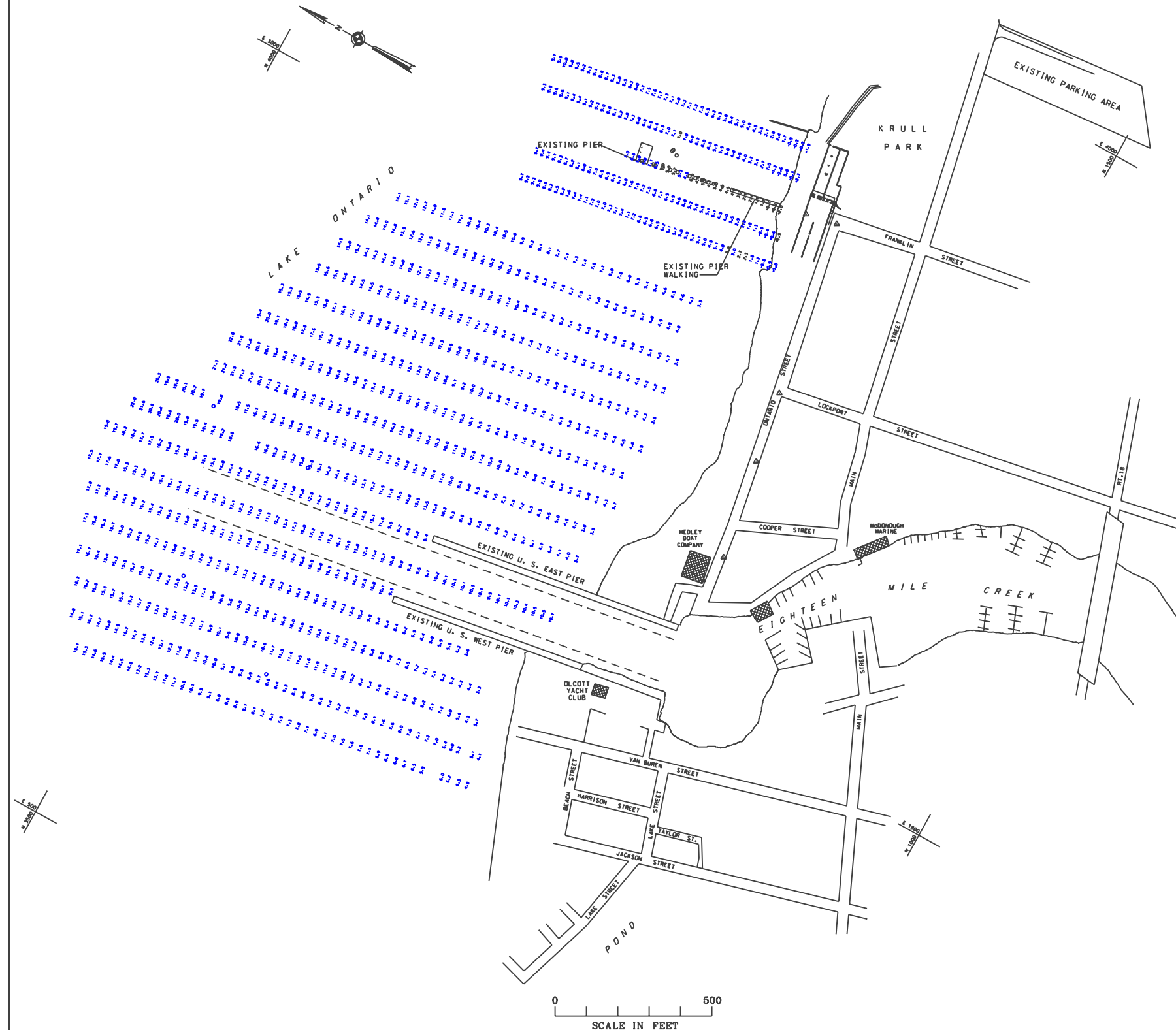
Plan 2: 625-Foot Long Rubblemound West Pier Extension/ 300-Foot Rubblemound Wave Absorber - This alternative includes a 124.5-foot extension from the West Pier and 600-foot dogleg breakwater to afford protection from waves arriving from the east through north-northeast. To afford protection from northeasterly wave directions, a 300-foot long rubblemound wave absorber would be constructed along the outer end of the west pier. The typical cross-section for the dogleg would be similar to Plan 1, except that a 7-foot walkway would be constructed along the crest with a top elevation of +14.5 feet LWD. The crest of the rubblemound extension between the West Pier (at +7 feet LWD) and the dogleg (at +14.5 feet LWD) would slope at 1V:15H to meet handicap requirements and to create the length necessary for a 150-foot entrance channel. The presence of the proposed wave absorber would require minor narrowing of the channel at that location to 120 feet. Figures 5 through 8 present the plan and typical cross-sections.

Plan 3: Rubblemound Wave Absorbers - This alternative includes the construction of three rubblemound wave absorbers along the channel side of the East Pier and two absorbers along the West Pier (of the same cross-section proposed in Plan 2). The absorbers are separated by a gap of 100-feet. The wave absorbers would be effective for all wave directions and would function similar to those at Rochester Harbor. However, as the length of the Olcott piers are less than those at Rochester, the total length of the proposed absorbers are 995 feet, compared to an aggregate length of 1700 feet used at Rochester Harbor. It is expected that the wave attenuation obtained with this proposal would be less than the other alternatives and would be ascertained during the next study phase. No construction lakeward of the existing piers would be required. Encroachment into the federal channel would occur near the toe of the structures, reducing the entrance channel width to a minimum of 100-feet. Figure 9 presents the proposed plan.

References:

Bottin, R.R. and Acuff, H.F. 1990. *Olcott Harbor, New York, Design for Harbor Improvements*, Coastal Model Investigation, Technical Report CERC-90-1, U.S. Army Waterways Experiment Station, Vicksburg, MS.

USAED Buffalo. 1992. *Preconstruction Engineering And Design Phase Reevaluation Report, Olcott Harbor Project, Olcott, NY*, U.S. Army Corps of Engineers, Buffalo, NY.



GENERAL NOTES:

1. BENCH MARK: B.M. HEDLEY, (1942), IS IN THE TOWN OF OLCOTT, NIAGARA COUNTY, NEW YORK, ON EAST SIDE OF THE HARBOR, ABOUT 175 FEET EAST OF THE INNER END OF THE ENTRANCE PIER, IN SOUTH FACE OF THE HEDLEY BOAT COMPANY BUILDING, 0.9 FOOT FROM CORNER NEARER THE HARBOR, 2 1/4 FEET ABOVE THE GROUND, BEING HORIZONTAL LINE OF CROSS IN BRONZE DISC SET INTO THE CONCRETE FOUNDATION ELEVATION 251.184 FEET (IGLD).
2. PROJECT DEPTHS & SOUNDINGS ARE IN FEET AND ARE REFERRED TO LOW WATER DATUM ELEVATION 242.8 FEET ABOVE MEAN WATER LEVEL AT FATHER POINT QUEBEC, INTERNATIONAL GREAT LAKES DATUM (IGLD), 1955.
3. SOUNDINGS WERE BASED ON SURVEYS TAKEN IN MAY 1988 AND IN JUNE 1990.

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3. SOUNDINGS WERE BASED ON SURVEYS TAKEN IN MAY 1988 AND IN JUNE 1990.

REVISION	DATE	DESCRIPTION	BY
SMALL BOAT HARBOR IMPROVEMENT PROJECT QLCOTT HARBOR, NIAGARA COUNTY, NEW YORK			
EXISTING CONDITIONS			
DRAWN BY: M. C. M.		DRAWING NUMBER	
DESIGNED BY: M. C. M.			
CHECKED BY:		SHEET OF	



OlcottPhoto1986.dgn

FIGURE 2. 1986 AERIAL VIEW OF OLCOTT HARBOR, NY

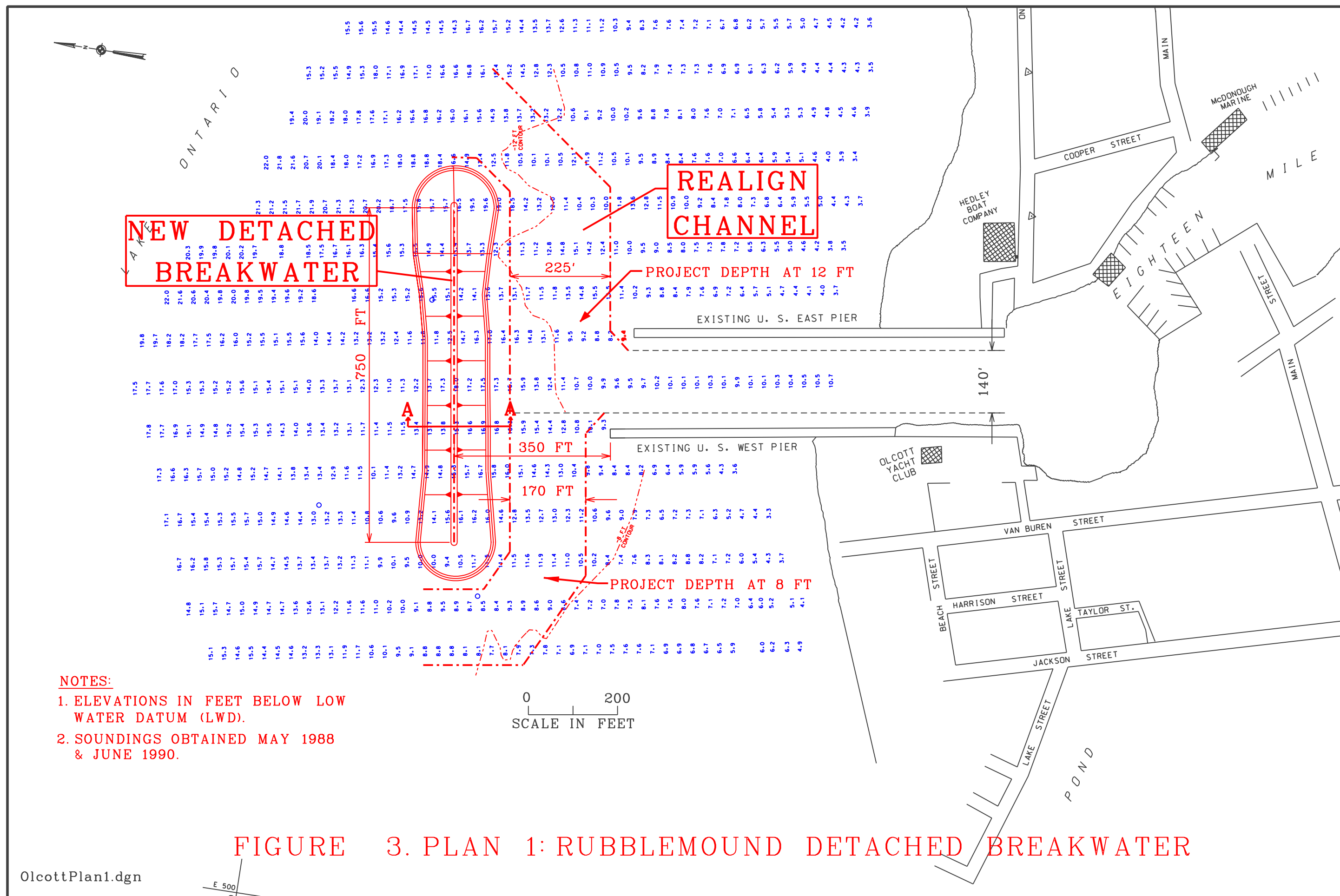


FIGURE 3. PLAN 1: RUBBLEMOUND DETACHED/BREAKWATER

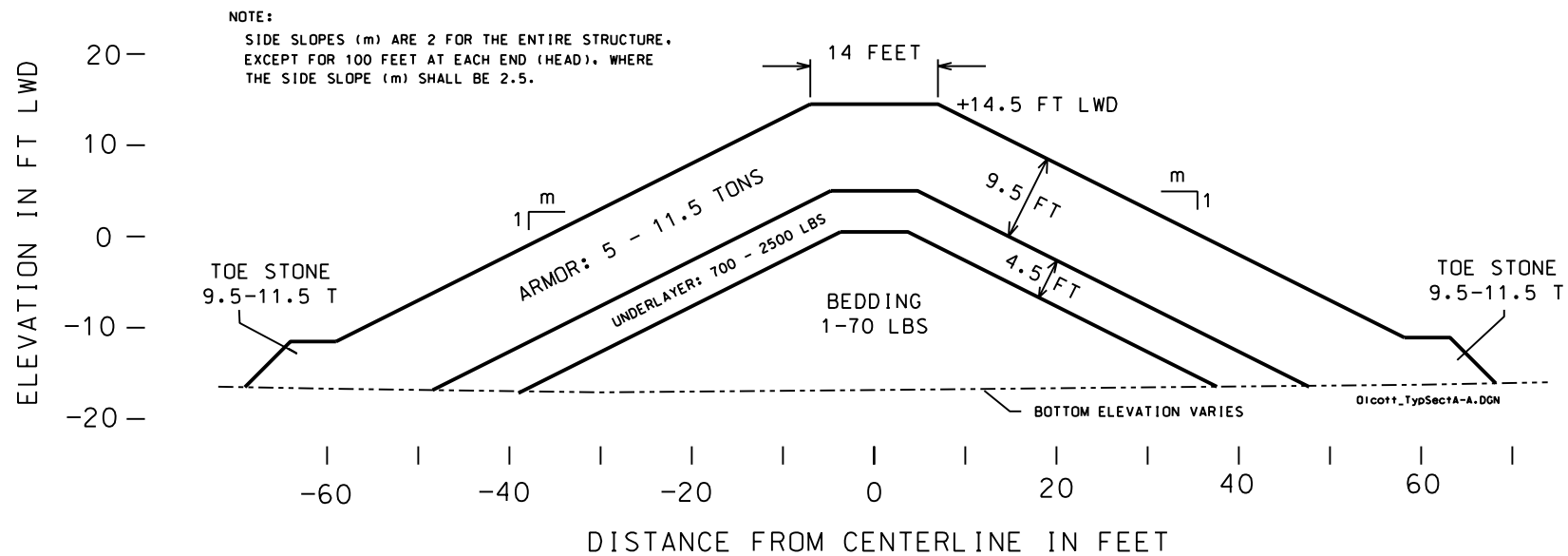
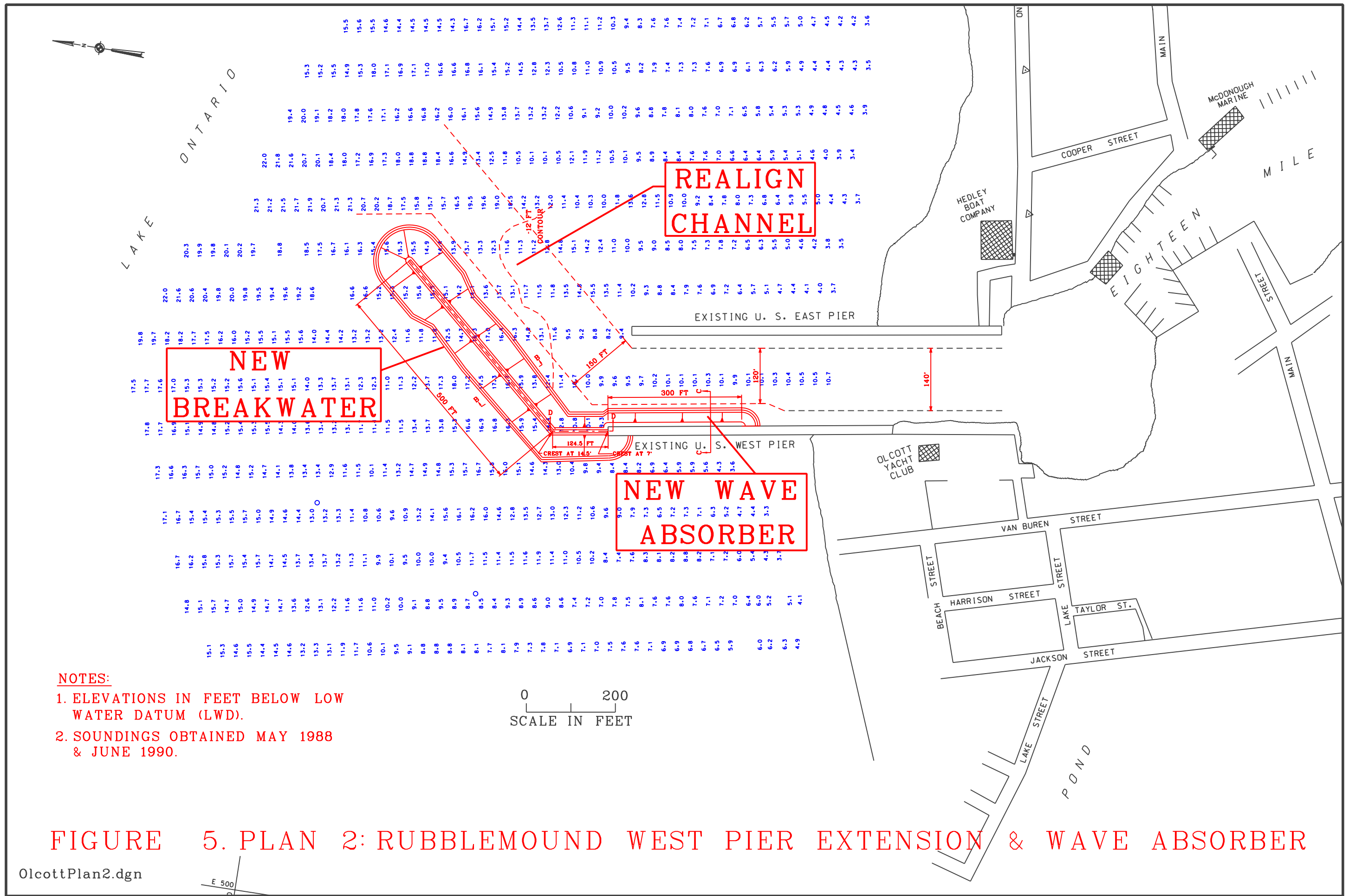


FIGURE 4. OLCOTT HARBOR, TYPICAL SECTION A-A



SIDE SLOPES (m) ARE 2 FOR THE ENTIRE STRUCTURE, EXCEPT FOR 100 FEET AT THE LAKEWARD END (HEAD), WHERE THE SIDE SLOPE (m) SHALL BE 2.5.



FIGURE 6. OLCOTT HARBOR, TYPICAL SECTION B-B

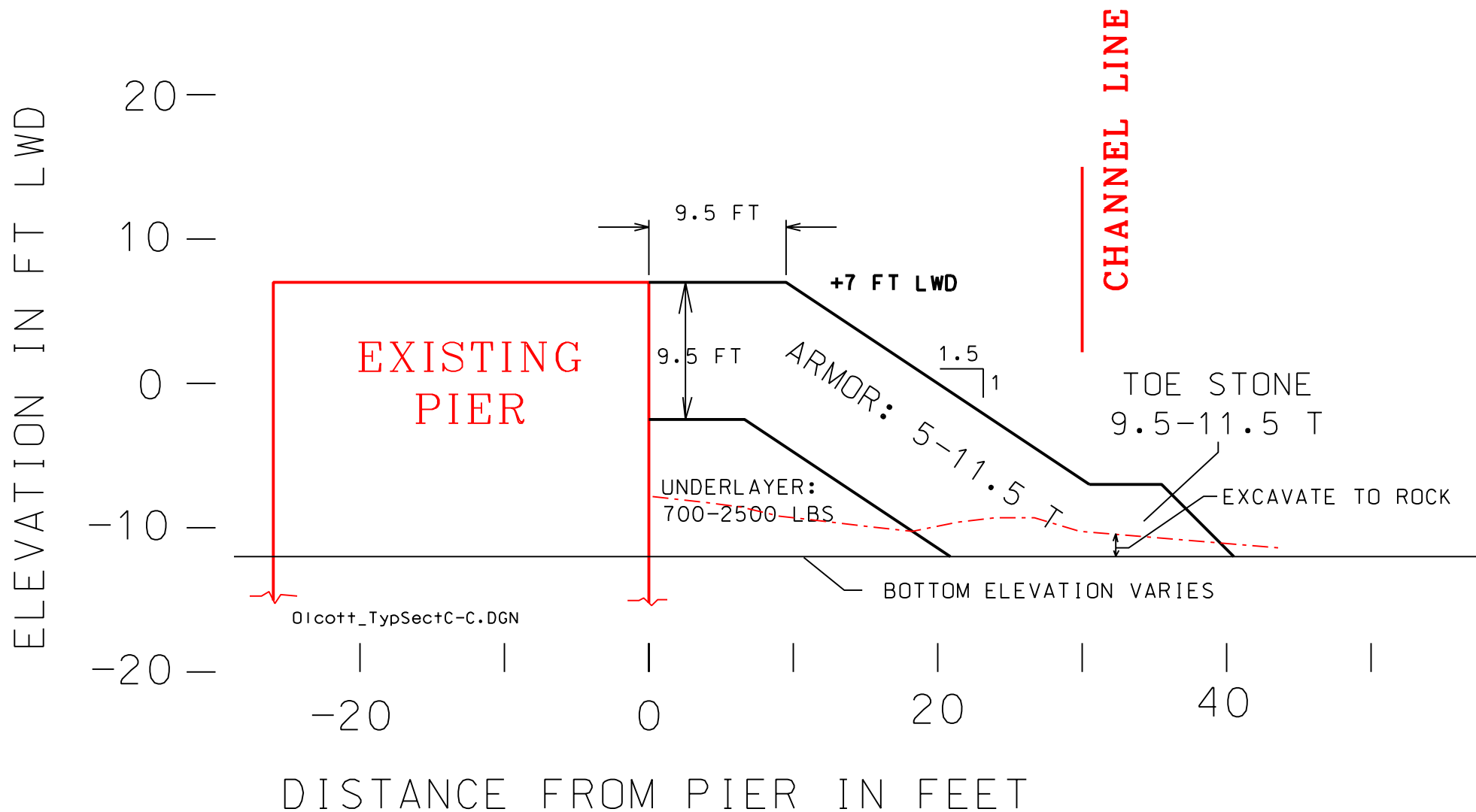


FIGURE 7. OLCOTT HARBOR, TYPICAL SECTION C-C

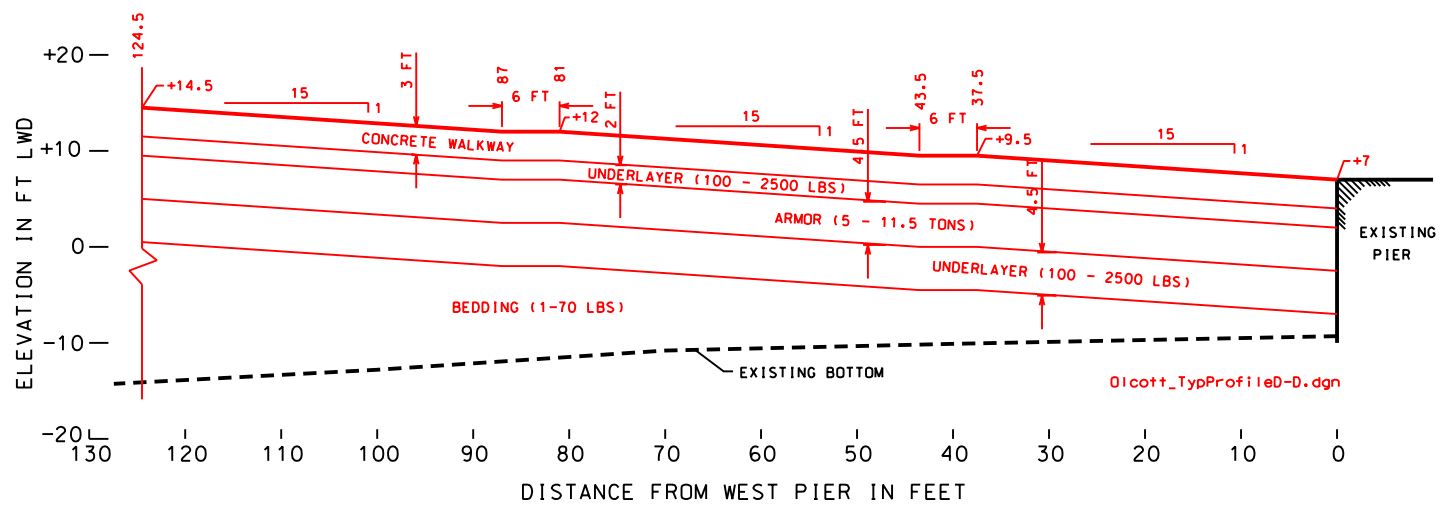


FIGURE 8. OLCOTT HARBOR, TYPICAL PROFILE D-D

