DACW-33-85-D-0011 Delivery Order 0021
Farmington River Basin, Simsbury CT

FILE COPY

ATLANTIC TESTING LABORATORIES, LIMITED

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February 26, 1988

U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

Attn: Mr. Ron DeFilippo

Re: New Haven Harbor Improvements Project
New Haven, CT
Contract No. 87-89 DACW 33-85-D-0011
Delivery Order No. 0022
ATL Report No. CD024-1-1-88

Gentlemen:

In accordance with Delivery Order No. 0022 dated 87, June 25, attached is one final copy of our Engineering Report for the subsurface investigation performed at New Haven, CT.

By copy of this letter we are also transmitting two copies of this report to the Chief of the Geotechnical Engineering Branch.

If you have any questions or comments, please do not hesitate to contact our office.

Respectfully submitted,

Gregory R. Hargrave

Gregory R. Hargrave
Geologist

GRH/dh

attchs.

Section 1

New Haven Harbor Improvements Project

New Haven, CT

Contract No. 87-89 DACW 33-85-D-0011

Contracting Officer:

Thomas Rhen, Colonel, CE, Division Engineer

Delivery Order No. 0022

Prepared for: U.S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

Prepared by: Atlantic Testing Laboratories, Limited
P.O. Box 29
Canton, New York 13617

ATL Report No.: CD024-1-1-88

30 December 87

# Section 2

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## Section 2

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# Section 3

## SCOPE OF INVESTIGATION

a. Delivery Order No. 0022

CHECKED BOX APPLIES: [X] ORDER FOR SUPPLIES OR SERVICES [ ] REQUEST FOR QUOTATIONS NO. RETURN COPY(IES) OF THIS QUOTE BY (THIS IS NOT AN ORDER. See DD Form 1155r)

5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1 DO

| 1. CONTRACT/~~PURCH~~ ORDER NO. | 2. DELIVERY ORDER NO. | 3. DATE OF ORDER | 4. REQUISITION/PURCH REQUEST NO. |
|---|---|---|---|
| DACW33-85-D-0011 | 0022 | 87 JUN 25 | GEB 87-79 |

6. ISSUED BY: Department of the ~~Army~~ CODE
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02254-9149
BUYER/SYMBOL: Apidianakis/CENED-CT-C Telephone: Area Code 617/647-8207

7. ADMINISTERED BY: (If other than 6) CODE

8. DELIVERY FOB: [X] DEST [ ] OTHER (See Schedule if other)

9. CONTRACTOR/QUOTER CODE FACILITY CODE

NAME AND ADDRESS:
Atlantic Testing Laboratories, ~~Inc.~~
Ltd.
P. O. Box 29
Canton, New York 13617

10. DELIVER TO FOB POINT BY: In accordance with Paragraph 7 of Attachment

11. CHECK IF BUSINESS IS: [ ] SMALL [ ] SMALL DISADVANTAGED [ ] WOMEN-OWNED

12. DISCOUNT TERMS: NET

13. MAIL INVOICES TO: Finance & Accounting Officer at Issuing Office

14. ~~SHIP TO~~ Services for: CODE
U. S. Army Engineer Division, New England
ATTN: Geotechnical Engineering Branch
424 Trapelo Road
Waltham, Massachusetts 02254-9149

15. PAYMENT WILL BE MADE BY: CODE
Finance and Accounting Officer at Issuing Office

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. TYPE OF ORDER: DELIVERY [X] PURCHASE [ ]

This delivery order is subject to instructions contained on this side of form only and is issued ~~XXXXXXXXXXXXXXXXXX~~ in accordance with and subject to terms and conditions of above numbered contract.

Reference your furnish the following on terms specified herein, including, for U.S. purchases.

General Provisions of Purchase Order on DD Form 1155r (EXCEPT CLAUSE NO. 12 APPLIES ONLY IF THIS BOX [ ] IS CHECKED, AND NO. 14 IF THIS BOX [ ] IS CHECKED); special provisions ; and delivery as indicated. This purchase is negotiated under authority of 10 USC 2304(a)(3) or as specified in the schedule if within U.S., its possessions or Puerto Rico; if otherwise under 2304(a)(6).

[ ] If checked, Additional General Provisions apply; Supplier shall sign "Acceptance" on DD Form 1155r and return copies.

SBSA STATUS
GEB
AE/PS COOR
EJA

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
96X3121 General Investigations
AF201055400GA00 (MD) $109,408.00

| 18. ~~Contract~~ Line ITEM NO. | 19. SCHEDULE OF SUPPLIES/SERVICES | 20. QUANTITY ORDERED/ ACCEPTED * | 21. UNIT | 22. UNIT PRICE | 23. AMOUNT |
|---|---|---|---|---|---|
| | Furnish necessary equipment and personnel to perform a seismic survey and borings for the proposed dredging in the New Haven Harbor channel. | APPROX. | | | ESTIMATED |
| 1.1 | Geologist | 142 | HR | $40.00 | $5,680.00 |
| 1.3 | Per Diem - Overnight Stay | 15 | DAY | 45.00 | 675.00 |
| 1.4 | Mileage from Waltham, MA and Return | 750 | MI | .35 | 262.50 |
| 2.1 | Geotechnical Report | 1 | JOB | 60% of Line Item 1.1 | 3,408.00 |
| | | APPROX. | | | ESTIMATED |

* If quantity accepted by the Government is same as quantity ordered, indicate by ✓ mark. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA BY: THOMAS A. RHEN, Colonel, CE Division Engineer ~~CONTRACTING OFFICER~~ XXXXX

25. TOTAL $109,408.00

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN: [ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED, AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

DATE SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE

27. SHIP. NO. [ ] PARTIAL [ ] FINAL

28. D.O. VOUCHER NO.

30. INITIALS

31. PAYMENT [ ] COMPLETE [ ] PARTIAL [ ] FINAL

32. PAID BY

33. AMOUNT VERIFIED CORRECT FOR

34. CHECK NUMBER

36. I certify this account is correct and proper for payment.

DATE SIGNATURE AND TITLE OF CERTIFYING OFFICER

35. BILL OF LADING NO.

37. RECEIVED AT 38. RECEIVED BY 39. DATE RECEIVED 40. TOTAL CONTAINERS 41. S/R ACCOUNT NUMBER 42. S/R VOUCHER NO.

DD FORM 1155 92 SEP PREVIOUS EDITION WILL BE USED UNTIL EXHAUSTED.

STANDARD FORM 36 JULY 1966
GENERAL SERVICES ADMINISTRATION
FED PROC REG (41 CFR 1-18.101)
Exception Approved March 1977

# CONTINUATION SHEET

REF NO. PAGE DOC BEING CONTD
Delivery Order No. 0022
DACW33-85-D-0011

PAGE 2 OF 2

NAME OF OFFEROR OR CONTRACTOR
Atlantic Testing Laboratories, Ltd.

| ITEM NO | SUPPLIES/SERVICES | QUANTITY | UNIT | UNIT PRICE | AMOUNT |
|---|---|---|---|---|---|
| 3.1 | Mobilization and Demobilization | APPROX. 2 | JOB | $ 180.00 | ESTIMAT $ 360.00 |
| 3.2 | Mileage from/to Waltham, MA | 900 | MI | .35 | 315.00 |
| 3.4 | Survey Crew | 24 | DAY | 440.00 | 10,560.00 |
| 3.5 | Overnight Per Diem | 24 | DAY | 90.00 | 2,160.00 |
| 3.6 | Data Reduction & Plotting | 1 | JOB | 100% of Line Item 34 | 10,560.00 |
| 3.7 | Standby Time | 32 | HR | 55.00 | 1,760.00 |
| 4.1 | Sample Delivery | 2 | JOB | 80.00 | 160.00 |
| 6.1 | Mobilization and Demobilization | 1 | JOB | 700.00 | 700.00 |
| 6.2 | Mileage from/to Waltham, MA | 250 | MI | 1.15 | 287.50 |
| 10.10 | 1500 Sq. ft. Barge | 11 | DAY | 1,500.00 | 16,500.00 |
| 10.11 | Standby time for 1500 square foot barge | 32 | HR | 115.00 | 3,680.00 |
| 14.1 | Drive Sample Boring, 0-50 ft. | 215 | LF | 22.00 | 4,730.00 |
| 18.1 | Casing-BX NX Size | 65 | LF | 18.00 | 1,170.00 |
| 18.2 | Casing-HX and 6-inch size | 150 | LF | 28.00 | 4,200.00 |
| 22.3 | Diamond Core Drilling - NWX size and/or NWM | 40 | LF | 45.00 | 1,800.00 |
| 27.1 | Mobilization and Demobilization (reflection) with Floating Plant | 1 | JOB | 2,400.00 | 2,400.00 |
| 27.2 | Mileage from/to Waltham, MA | 500 | MI | 1.20 | 600.00 |
| 27.4 | Seismic Crew and Equipment | 12 | DAY | 1,650.00 | 19,800.00 |
| 27.5 | Overnight Per Diem for Seismic Crew | 12 | DAY | 140.00 | 1,680.00 |
| 27.6 | Data Reduction | 1 | JOB | 60% of Line Item 27.4 | 11,880.00 |
| 27.7 | Standby Time | 34 | HR | 120.00 | 4,080.00 |

ATTACHMENT NO. 1

GEB REQUISITION NO. 87-79 DACW 33-85-D-0011

DELIVERY ORDER NO. 0022

EXPLORATION INSTRUCTIONS

PROJECT: New Haven Harbor Improvement Project

SITE: New Haven, CT

PURPOSE: Determine dredging conditions for channel deepening to 42 ft. MLW and widening from 400 feet to 500 feet in places

1. SCOPE OF INVESTIGATIONS

a. Seismic Work. A seismic survey shall be done to determine depth to bedrock and engineering characteristics of materials to be dredged down to 42 feet MLW. The seismic survey limits shall encompass the entire channel where widening and deepening are designated. The general area is shown on Attachment 2. Detail plans showing the project limits, bottom soundings and survey point locations have been provided to you separately. It is estimated that two seismic lines shall extend along the sides of the channel. Additional cross lines shall be run in the vicinity of the channel bend where rock is expected above proposed dredging depth. The density of data needed to define zones where rock and fill are shallow shall be judged in the field. The lines shall be located according to the coordinate system and Corps of Engineers survey points shown on detail drawings provided separately. The seismic survey shall use MLW as the datum.

b. Borings.

(1) Eleven borings shall be executed in the channel in the approximate positions shown on Attachment 2. The boring program will not be started until after the draft seismic report has been reviewed by the Corps of Engineers. (See completion schedule below.) The final positions and depths of the borings shall be adjusted depending on the results of the seismic survey.

(2) Borings shall be done to a depth of 45 feet MLW. While in overburden continuous drive sample borings with 140 lb. hammer (30 inch drop) and a 2-1/2 inch solid spoon sampler. If refusal is encountered, the boring shall be continued using NWX coring as needed to reach 45 feet MLW. Five feet of bedrock shall be cored whenever encountered above 45 feet MLW.

c. Surveys and Positioning. Exploration points shall be located in accordance with the coordinate system shown on the 1 inch = 200 feet scale maps and the Corps of Engineers survey monument locations provided to you separately. Conventional survey methods and private radio navigation means with trisponders shall be used as appropriate.

## 2. SITE CONDITIONS

New Haven harbor is 4.5 miles long and varies in width from 1 to 4 miles. Except for dredged areas, depths over about half of the outer harbor are from 15 to 25 feet, and in the inner harbor are less than 6 feet, for the most part. The channel presently is maintained at 35 feet MLW.

Borings are assumed to be in areas where bottom elevations are about 20-25 feet MLW and sediments about 20-25 feet thick overlying rock or till. Sediments may be organic silt, silt and sand. Till may also occur.

The tide in New Haven Harbor is semi-diurnal. At the head of the harbor, the tide has a mean range of 6.3 feet and a mean spring range of 7.2 feet. At the harbor entrance, the mean range of tide is 6.2 feet and the mean spring range is 7.1 feet. Extreme tides in the vicinity of the harbor entrance, due to storm winds and atmospheric pressure, have ranged from more than 2.5 feet below the plane of mean low water to about 12.4 feet above the same datum.

The inner harbor is fairly well protected from storm and wave action by natural land barriers, but the outer harbor, except for the shelter of the breakwaters, is exposed to southerly storms. Morris Cove, on the east side of the outer harbor, affords good anchorage for yachts, but is rough during westerly winds.

Maximum currents at the harbor entrance are 1.4 knots (2.36 fps) on the flood and 0.9 knots (1.52 fps) on the ebb tide. In the entrance channel between the breakwaters, the average current is 0.4 knots (0.68 fps).

The harbor is very active and accommodates very large vessels. The floating plant used for drilling operations should be suitable for the turbulence that is likely to occur. The Coast Guard should be contacted in advance of drilling for information about conditions and regulations relating to working in the harbor.

## 3. RIGHTS OF ENTRY

The Contractor is responsible for securing rights of entry for all staging operations.

## 4. COORDINATION

Two weeks before any work in the navigation channel, the U. S. Coast Guard shall be contacted at tel. 203-772-2464. At least 5 days before work initiation and every day thereafter, Ron DeFilippo, Corps of Engineers, shall be contacted at tel 617-647-8175. The alternate point of contact is Mr. Yuri Yatsevitch, tel 617-647-8387. Sample delivery shall be coordinated with the Director, NED Materials & Water Quality Laboratory, tel 617-647-8357/8392.

5. EXPLORATION NUMBERS

The seismic lines shall be numbered beginning with S-1 in order of their completion. Likewise borings lettered A through K shall be renumbered FD-87-1 through FD-87-11. The new exploration designations shall be indicated in the report and shown on a plan of explorations.

6. GOVERNMENT REVIEW

The Government will review the draft submittal of the geotechnical report. Subsequent to such review, the contractor shall accomplish any corrections which may be directed as a result of the Government review.

Government reviews will take approximately ten calendar days from receipt of draft reports. The complete final geotechnical report shall be submitted postmarked no later than seven calendar days after receipt of draft report with Government comments.

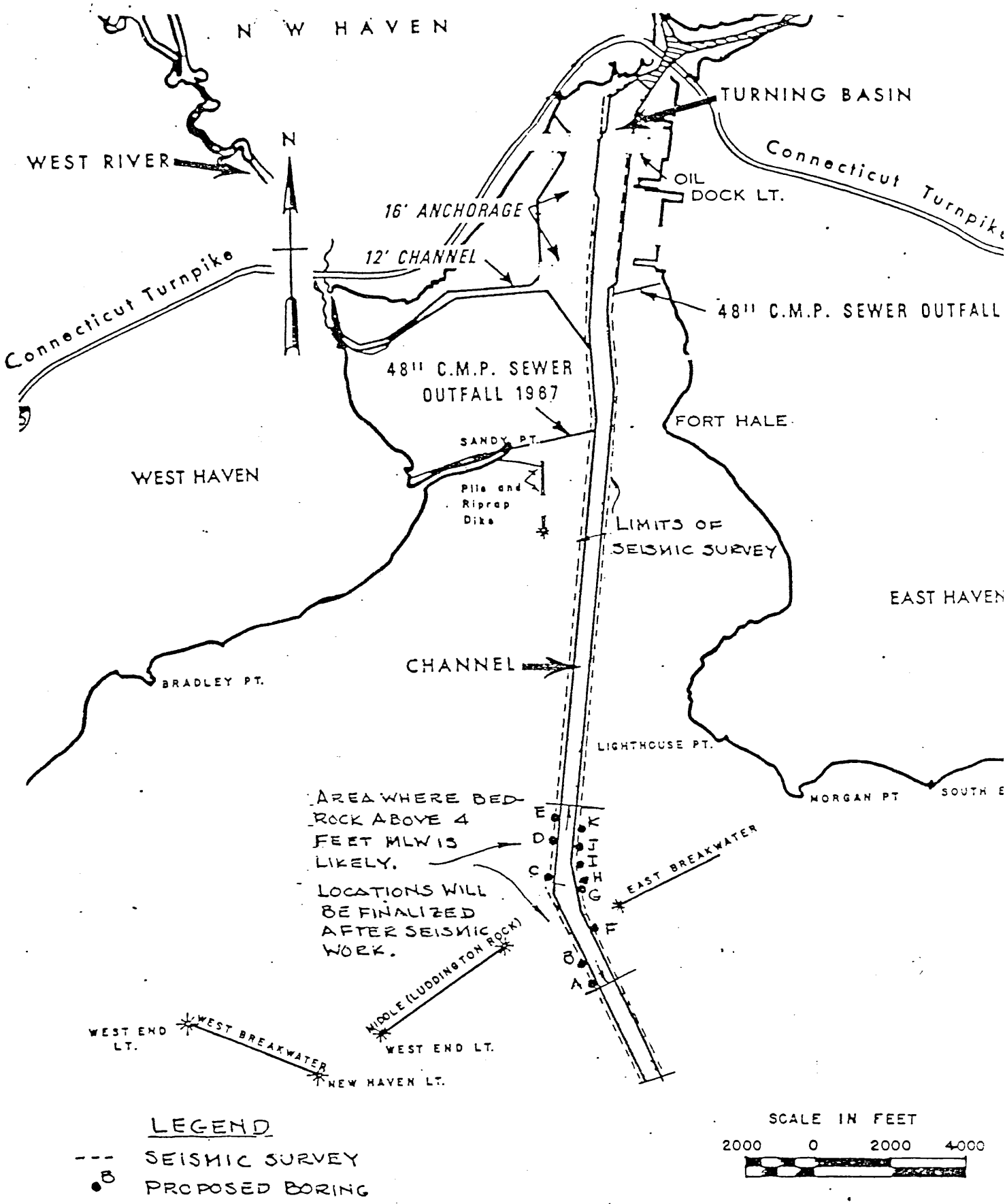
7. COMPLETION SCHEDULE

Seismic services under this delivery order shall start 15 calendar days after receipt of the delivery order. The seismic survey shall be done first. The duration of the field work is estimated to be 12 days. The draft report of the seismic work shall be submitted separately within 10 days to completion of that work. The borings shall commence within two weeks after review of the draft seismic report. Duration of drilling is estimated to be 12 days. The draft report of drilling shall be submitted with 10 days after completion.

8. QUALITY CONTROL

You will be held responsible for the quality of the maps submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level effort required for that submission, (b) elimination of conflicts, errors and omissions, and (c) the overall professional and technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.




ATTACHMENT 2

## b. Project Site

The project site is located in New Haven Harbor, New Haven, CT. The investigation took place on the shipping channel and its margins. The general area of the investigation is shown on Attachment 2 of the Delivery Order.

## c. Purpose

The purpose of the investigation was to determine the dredging conditions for channel deepening to 42 ft MLW and widening from 400 ft to 500 ft at selected locations.

## d. Scope of Work

Inspection and exploration instruction were provided by the Army Corps of Engineers, New England Division, in Delivery Order No. 0022 and are included in Section of 3a of this report. General inspection and exploration instruction were provided by the Army Corps of Engineers, New England Division, through the contracted Specifications for Services, and Equipment Necessary for Conducting Geotechnical Exploratory Work Various Locations In New England.

The seismic survey work was performed to determine the depth to bedrock and engineering characteristics of the material to be dredged down to 42 feet MLW. The seismic survey limits encompassed the entire channel where widening and deepening are designated. The general area is shown on Attachment 2 of the Delivery Order. Weston Geophysical Corporation was subcontracted to provide equipment and personnel to generate seismic reflection and refraction data, provide radio navigation for the seismic work and provide a report of their findings.

Surveyors from Atlantic Testing Laboratories, Limited provided conventional survey control methods and equipment to check Weston Geophysical Corporation's radio navigation. Atlantic Testing Laboratories Limited also provided locations and elevations for the test borings.

Drilling and sampling was performed by Atlantic Testing Laboratories, Limited personnel using Atlantic Testing Laboratories' equipment. The test borings were sampled using a 1-3/8" I.D. split spoon sampler advanced with a 140 lbs. hammer. The borings were advanced using HX size casing with a 300 lbs. drive hammer. The casing was cleaned using a 3-7/8" roller bit.

The proposed scope of work required eleven borings drilled from a barge in the harbor. Two borings were attempted with one being completed. The borings were attempted from October 28, 1987 to November 12, 1987 using a 40'x 40' barge. Adverse winds and seas prevented continuing the work with the equipment employed. Work was terminated as predicted weather was not favorable.

# Section 4

## QUALITY CONTROL

a. General Certification Statement

I hereby certify that the records, equipment and procedures mentioned herein were used to perform the subsurface exploration. I also certify that the work was performed in a professional manner and meets the requirements set forth in the Delivery Order. This report has been subject to my review and is both complete and technically accurate.

CERTIFIED January 8, 1988

Spenger F. Thew, P.E./L.S.

## b. General Statement

The equipment and procedures used to perform the seismic investigation are summarized in the report prepared by Weston Geophysical Corporation, which is included as a separate enclosure.

## c. Records Taken

Pertinent drilling procedures, sampling operations and soil classification data were noted on the following forms provided by the Corps of Engineers:

| | |
|---|---|
| NED 121 | Field Log of Test Boring Summary |
| NED 58 and 58a | Field Log of Test Boring |

A series of logs for each of the borings is included in Section 8 along with location maps.

A summary of daily activities and a telephone log are Table 1 and Table II of Section 5, respectively. A chain of custody log is in Section 6. Safety meeting, reports, NED Form 251 are in Section 7.

## d. Equipment Used

All equipment and supplies were provided by Atlantic Testing Laboratories Limited, with the exception of that provided by subcontractors. A listing of pertinent equipment follows:

1. Survey Equipment
   - 2 Wild Heerbrugg T-1 6 minute Theodolite
   - Wild Heerbrugg, NAKI automatic level
   - 15 foot, extendable, fiberglass, stadia rod
   - 2 way radios

2. Drilling Equipment
   - CME 45 drill rig mounted on skids
   - HX size casing with both spin and drive shoes
   - Drill rod, NX taper threaded in 2 ft, 5 ft, and 10 ft lengths used for sampling and advancing 3-7/8" roller bit
   - 300 lbs. hammer and a 140 lbs. safety hammers, the 300 lbs. hammer was used to advance the HX casing and the 140 lbs. safety hammer was used to advance the 2' x 1-3/8" split spoon sampler
   - 2' x 1-3/8" I.D. Split spoon sampler

3. Subcontract Equipment
   - Boat/Operator
   - Barge
   - Crane/Operator
   - Aluminum boat with outboard motor/operator

## e. Procedures

### 1. General Statement

A marine seismic and test boring investigation was to be performed in New Haven Harbor, New Haven CT. Presently the marine seismic section and part of the program has been completed. The details of the marine seismic investigation is a separate attachment to this report.

### 2. Surveying Procedures

Atlantic Testing Laboratories' surveyors were onsite throughout the duration of the project to locate seismic lines, to set buoys at the boring locations, to determine the actual location as drilled, and to provide tide elevations as the seismic survey and drilling programs proceded.

#### a. Horizontal Control

The positions of the borings were determined by angle-angle intersections using two Wild Heerbrugg TI Theodolites from control points established by the Corps of Engineers on the Luddington Breakwater (Haven 1977) and at the Old Lighthouse (Old Light). The angles were calculated from coordinates provided by the Corps of Engineers for each boring and control station.

#### b. Vertical Control

The elevation of the Harbor bottom at each boring was measured from the water surface, the elevation of which was simultaneously determined from a temporary tide gauge installed on the eastern most point of the seawall on the north shore of Morris Creek inlet adjacent to Lighthouse park. The elevation of the tide gauge was determined by a level-run from Benchmark 4 in Morris Cove.

### 3. Boring Location Procedures

The surveyors located at two different points one on shore, the other on the break water, guided a crew in the Aluminum boat to the site of the proposed boring using 2-way radios. When the person in the aluminum boat was at the site of the proposed boring an anchor attached to a float was dropped overboard. Up to 4 Danforth anchors were used to position the barge over the proposed boring locations.

### 4. Sampling and Drilling Procedures

Sampling techniques involved retrieving material using the Standard Penetration Test. A 1-3/8" I.D. x 2 ft long split spoon sampler was advanced using a 300 lbs hammer in 3.D. Samples were classified in the field in accordance with ASTM D-2488. Representative samples were taken from each soil sampling run and placed in 16 oz. jars with hermetically sealed lids. Sample jars were labeled using ENG Form 1742.

# Section 5

## SUMMARY OF ACTIVITIES
## AND
## TELEPHONE LOG

# SUMMARY OF ACTIVITIES

## New Haven Survey

TABLE IA

CD024 - NEW HAVEN, CT

## SUMMARY OF ACTIVITIES FOR SEISMIC SURVEY

| Date | Activity |
|---|---|
| July 28<br>Tuesday | Survey Crew on site noon - to 6:30 p.m.<br>- Performed New Haven Harbor site inspection to identify monumentation and commence to make arrangements to reestablish missing monumentation<br>- Contacted and received a map of the harbor and discussed the seismic work to be performed with the U.S. Coast Guard |
| July 29<br>Wednesday | - Spencer Thew met with the Corps of Engineers regarding the use of radio navigation equipment to position the seismic crew |
| July 30<br>Thursday | - Surveyors reviewed prints from the Corps, of the proposed shipping channel.<br>- S. Thew began making arrangements for horizontal positioning using radio navigation equipment per the procedure outlined by the Corps.<br>- Plotted Corps Survey Stations on blueprints of the shipping Channel<br>- Sent Weston Geophysical the prints of the shipping channel, along with desriptions and coordinates of the Corps of Engineer Survey Stations (via Federal Express)<br>- Contacted Hill Bloom of Talmadge Brothers, a fishing and dredging company regarding boats to transport the survey crews. He said that the salmon were spawning in the harbor and that I should contact the Department of Agriculture - John Volk, Aqua Culture 874-0696 before we did any drilling seismic work.<br>- S. Thew began making arrangements for horizontal positioning per the Corps procedure. It was felt more beneficial to use radio navigation equipment in lieu of standard surveying techniques since we could possibly incurr considerable standby time due to interference of shipping traffic and poor visibility due to the weather. |
| July 31<br>Friday | - S. Thew and J. Thew were making arrangements for safe and technically sound execution of the seismic investigation (refer to telephone log) |
| August 2<br>Sunday | - Survey crew organize equipment and depart for New Haven |

| Date | Activity |
| --- | --- |
| August 3<br>Monday | - Survey crew on site 10:00 a.m. to 5:00 p.m.<br>- Began to check monumentation and make arrangements to reestablish damaged points. |
| August 4<br>Tuesday | - Survey crew on-site 7:30 a.m. to 5:00 p.m.<br>- Located bookstore with U.S.G.S. maps in New haven bought 3 maps of the New Haven Quad and 3 of the Woodmont Quad<br>- Dave Strack plotted the U.S.C.E. monuments on the U.S.G.S. maps and the U.S.C.G chart Map<br>- Re-establish monumentation<br>- Met with Chief Kurowski of the U.S. Coast Guard about clearance in the barbor, we obtained clearance through August 16th<br>- Located marina for Weston Geophysical to dock their boat at Oyster Point Marina |
| August 5<br>Wednesday | - Survey crew on-site 8:00 a.m. to 5:00 p.m.<br>Ran U.S.G.S. elevations from a benchmark on the corner of Howard St. and Fifth St. to the Corps of Engineer monument that we designated as Station #9 on the sewer outfall<br>- Dave Strack in contact with U.S.G.S. office to obtain the benchmark elevation. Connecticut DOT will send the benchmark elevation and the mean low water conversion chart to our Canton Office and our motel (see Telephone Log)<br>- We went out in the harbor to test our radios and determine accessibility to breakwater; radios worked smoothly<br>- Dave Strack met with Superintendent of the New Haven Oil Terminal, they would like our business card to ensure our access to the U.S.C.E. monument<br>- Dave Strack tried to get access to a U.S.C.E. monument on the dock of the VI Power Company but the gate was locked, he spoke to the guard at the gate who said stop by Thursday morning, August 6th and meet with his Superintendent for access to the dock |
| August 6<br>Thursday | - Survey Crew on site 8:00 a.m. - 11:00 a.m.<br>- David Strack went to New Haven Oil Terminal and to United Illuminating Power Co. to give them ATL business cards to ensure access to their docks<br>- Left New Haven at 11:00 am |
| August 9<br>Sunday | - Loaded equipment and organized paper work<br>- Travel to New Haven |

| Date | Activity |
|---|---|
| August 10<br>Monday | - Survey crew on site 6:30 a.m. - 7:00 p.m.<br>- Weston Geophysical crew on site 8:00 a.m. - 7:00 p.m.<br>- Loaded up boat with seismic equipment<br>- Tried to calibrate the master trisponder with the remote trisponders<br>- Weston couldn't get a distance between Trisponders, concluded that the Master was on a different frequency than the remotes<br>- Ed Rostosky called his office and had another master and remote delivered to New Haven<br>- While waiting for additional equipment Weston representatives worked on their computer onboard the boat and prepared equipment for the project<br>- A trial run was made |
| August 11<br>Tuesday | - Survey crew on-site 7:30 a.m. - 7:30 p.m.<br>- Weston Geophysical on site at 8:00 a.m. - 7:30 p.m.<br>- Calibrated trisponders - two out of three were functionable<br>- Headed out to West Breadwater to set trisponder over monument<br>- Monument had been destroyed<br>- Fastened trisponder to the beacon on the East end of the Breakwater<br>- Weston Geophysical made two calibration runs to make sure equipment was working; equipment was functioning properly<br>- Surveyors established coordinates on the beacon by methods of triangulation<br>- David Carlson of survey crew took tidal information |
| August 12<br>Wednesday | - Survey crew on site 6:30 a.m. - 4:30 p.m.<br>- Weston Geophysical on site 8:00 a.m. - 5:00 p.m.<br>- Surveyors triangulate to the beacon on the West Breakwater - we did this as a check to insure the coordinates calculated Tuesday were correct<br>- Ran the triangulated data through our computer at Canton office via telephone, The coordinates at home office matched with those D. Strack calculated with field computer<br>- Weston inputed the coordinates that we provided for the beacon on the Breakwater into their computer and were ready to begin recording data<br>- Weston ran the first line with some difficulty since a barge blocked their second approach at the line<br>- Surveyors set up on shore to check locations obtained by radio navigation equipment<br>- David Carlson is taking tidal information and protecting trisponder<br>- After the first line was done we computed, via phone with our home office, the coordinates of the seismic locations to compare them with Weston's coordinates<br>- There was a discrepency between ATL's and Weston's by ~40' in the Northing, ~90' in the Easting<br>- This was due to a bad calibration on one of Weston's remote trisponders - this will be corrected<br>- David Carlson is continuing to recorded Tidal Data and protecting trisponders |

| Date | Activity |
|---|---|
| August 13<br>Thursday | - Survey crew on-site 7:50 a.m. - 4:30 p.m.<br>- Weston Geophysical on site 8:00 a.m. - 6:00 p.m.<br>- Ran 8 seismic lines ranging from 1000' to 6000' in length<br>- Coordinates are checking between standard survey method and radio navigation methods (see computations attached)<br>- Weston finished shooting seismic at 4:30 pm<br>- Weston went out to West Breakwater to replace batteries in trisponder returned at 5:30 pm<br>- Weston ran ~15,000' of line<br>- David Carlson is continuing to recorded Tidal Data and protecting trisponders |
| August 14<br>Friday | - Survey crew on site 7:45 a.m. - 5:00 p.m.<br>- Weston Geophysical on site 7:30 a.m. - 4:30 p.m.<br>- Surveyors located 1st mark, last mark and every tenth mark in a run, we then computed coordinates and compared them with those of Westons, on the average we were agreeing within 4' of each other<br>- Weston ran 22,000' of line<br>- Data showed most material was organic with rock at 90-100' below sea level<br>- Surveyors established a point at Fort Nathan Hale and designated as STA-15A<br>- David Carlson is continuing to recorded Tidal Data and protected trisponders |
| August 15<br>Saturday | - Survey crew on site 7:30 a.m. - 3:30 p.m.<br>- Weston Geophysical onsite 7:45 a.m. - 3:30 p.m.<br>- Surveyors are checking 1st and last mark in a line<br>- They check very close - within 3' in either direction<br>- Weston ran ~15,000' of line<br>- David Carlson is continuing to recorded Tidal Data and protecting trisponders |
| August 16<br>Sunday | - Survey crew on site 6:30 a.m. - 2:30 p.m.<br>- Weston on site 7:00 a.m. - 1:30 p.m.<br>- Weston ran ~15,000' of line<br>- Refraction is now complete up to the 35$^{o}$ corner in the channel<br>- Surveyors are continnuing to check first and last marks of each line - still checking very good<br>- Surveyors also re-established monumentation<br>- David Carlson is continuing to record tidal data and protect trisponders |
| August 17<br>Monday | - Survey crew on site 7:45 a.m. - 5:00 p.m.<br>- Weston Geophysical on site 7:45 a.m. - 5:00 p.m.<br>- Surveyors checked first mark on the first line, checked out good in the northing and in the easting<br>- Weston has all refraction completed except for line 13000 which will be completed Tuèsday<br>- Surveyors completed scraping the paint off the sandstone at Fort Hale<br>- David Carlson is continuing to record tidal data and protecting trisponders |

| Date | Activity |
|---|---|
| August 18<br>Tuesday | - Survey crew on site 8:00 a.m. - 4:30 p.m.<br>- Weston Geophysical on site 8:00 a.m. - 5:00 p.m.<br>- J. Thew returned to boat to check refraction and navigation equipment operation<br>- Ran line 13000 picked up bedrock data for the first 9000 ft in the last 4000 ft bedrock was to deep for the phone to pick up. Therefore by lengthening the distance between the air gun and phones gave deeper penetration. Ran the last refraction line - Boat was back in marina at 2:00 p.m.<br>- Refraction gear was unloaded and the reflection gear loaded on the boat<br>- David Carlson is continuing to record tidal data and protecting trisponders |
| August 19<br>Wednesday | - Survey crew on site 7:30 a.m. - 6:00 p.m.<br>- Weston Geophysical on site 8:00 a.m. - 6:00 p.m.<br>- Weston assembled the reflection equipment<br>- Set out sparker gear however it took more power than the generator could put out through the 20 amp breaker - needed a thirty amp breaker<br>- Set out bommer board ran line down middle of shipping channel (north to south) - tide is pulling us out at 4 knots would like to travel at two knots - data shows organics - will not penetrate them<br>- Barrels were tossed out to increase the drag slowed us from 3.7 knots to 2.5 knots which is slow enough for good data readings<br>- Ran 6 lines of reflection<br>- Completed about 1/3 of the reflection survey<br>- Weston went to breakwater to change batteries in trisponder<br>- David Carlson is continuing to record tidal data and protecting trisponders |
| August 20<br>Thursday | - Survey crew on site 8:00 a.m. - 5:00 p.m.<br>- Weston Geophysical on site 8:00 a.m. - 5:30 p.m.<br>- Set up sparker equipment on our way to the breakwater where we will continue reflection work<br>- Tested the sparker equipment in the channel as we traveled to breakwater<br>- Sparker can sense deeper into organics but not through them<br>- Weston ran line 108 from north to south with the sparker and for comparison and are running line 108 from south to north with the boomer board<br>- David Carlson is continuing to record tidal data and protect trisponders |
| August 21<br>Friday | - Survey crew on site 5:00 a.m. - 2:30 p.m.<br>- Weston Geophysical on site 5:00 a.m. - 2:30 p.m.<br>- Survey crew set up at Morgan Point to check reflection locations<br>- Ran ~15000' with the boomer board<br>- David Carlson is continuing to record tidal data and protect trisponders |

| Date | Activity |
| --- | --- |
| August 22<br>Saturday | - Survey crew on site 6:00 a.m. to 1:00 p.m.<br>- Weston on site 6:00 a.m. to 1:00 p.m.<br>- Finished the reflection survey, dismantled equipment and demobilized |

TABLE IB

CD024 - NEW HAVEN, CT

SUMMARY OF ACTIVITIES
FOR
SUBSURFACE EXPLORATION

| Date | Activity |
|---|---|
| October 28<br>Wednesday | - Surveyors, Geologist, and Drillers mobilized to New Haven on site 10:00am-6:00pm<br>- Surveyors began checking monumentation and making arrangements to re-establish control points on the East Breakwater and Luddington Rock Breakwater which they identified as missing, based on site inspection. |
| October 29<br>Thursday | - Surveyors, Geologist, and Drillers onsite 7:30am-5:30pm<br>- 40' x 40' sectional barge with 2 spuds and boat were mobilized<br>- Drillers unloaded equipment in preparation for mounting equipment on barge<br>- Surveyors work at establishing elevation at Morgan Pt.<br>- surveyors went to Coast Guard Station and obtained permission to run elevations from bench mark. Future requests for access to Coast Guard Dock are to be directed to Lt. Commander Murry at (773-2450)<br>- Geologist worked with surveyors in setting control, made arrangements for dockage, check on obtaining weather forecasting information<br>- Held safety meeting in am |
| October 30<br>Friday | - Surveyors, Geologist, and Drillers on site 8:00am-4:30pm<br>- Survey crew attempted to run elevation to breakwater rough water prevented them from finishing job<br>- Geologist, Drillers, and ship crew began loading barge and securing equipment<br>- Docking boat and barge at Ferry St. Bridge Dock |
| October 31<br>Saturday | - Surveyor, Geologist, and Drillers, on site at 7:00am-4:30pm<br>- Surveyors and Geologist established control on Luddington Breakwater which will be used for positioning the barge over the drill holes.<br>- Drillers and Ship crew finished loading the barge, drill rig was welded to the barge<br>- Drilling equipment was loaded at Talmadge Brother Dock<br>- Steamed into position on first boring, no drilling performed since it took approximately 2 hours to get positioned |
| November 1<br>Sunday | - Surveyors, Geologist, and Drillers on-site 7:00am-8:30pm<br>- Positioned boat & barge for drilling<br>- Drilled hole FD-A to a depth of 45 feet (MLW)<br>- Returned to Ferry St. bridge dock |

| Date | Activity |
|---|---|
| November 2<br>Monday | - Surveyors, Geologist, and Drillers on site at 7:00am-8:00pm<br>- Weather: morning was warm, calm (Easterly winds) , waves 1 ft. - afternoon was cool, rough water (Westerly winds), waves 2 - 3+ ft.<br>- Started work on FD-G advanced boring to 34.3 ft when high winds and tide caused anchors on the barge to break loss, spuds would not hold barge. It was necessary to return to Ferry Street Bridge Dock<br>- Survey crew provided water readings (MLW) and start to set control point on East Breakwater |
| November 3<br>Tuesday | - Surveyors, Geologist, and Drillers on-site at 6:45am-3pm<br>- Weather Southerly winds with 2'-3' waves, temp. 50°F<br>- Tried to reposition over FD-G, could not reposition due to rough water and strong winds.<br>- Survey crew on-site to provide water reading (MLW)<br>- Stayed onsite until 1:00 p.m. and then returned to dock. Waited until 3:00 p.m., winds did not calm. |
| November 4<br>Wednesday | - Surveyors, Geologist, and Drillers, on-site 7:00am-3:00pm<br>- High winds caused rough water (3 - 4 ft. waves) therefore the crew did not attempt to drill for safety reasons. Forecast was for high winds through Thursday pm, therefore the decision was made to not attempt to work Thursday<br>- Held Safety Meeting<br>- Left for Canton office by commercial airline at 5:30pm |
| November 6<br>Friday | - Left Potsdam airport 5:00am by charter flight<br>- Surveyors, Geologist, Drillers on site 8:00am-3:00pm<br>- Weather at 8:00am, winds gusting up to 35 mph from the SW shifting to the NW in the afternoon, waves 3'(+), temp. 40°F<br>- Discussed with the captain the possibility to work in PM. Waited until 3pm and decided today was to rough and windy to work on water.<br>- Tomorrow weather forecast sounds favorable, winds from NW @ 15 mph. Scheduled to start for @ 6:00am<br>- Moved motor boat from Ferry St. Bridge Dock to Light House Bait Shop so surveyors could start before the barge arrives on location. |
| November 7<br>Saturday | - Surveyors, Geologist, and Drillers onsite 6:00am-2:00pm<br>- Weather (am): temp. 40°F, winds out of West @ 20+ mph, waves 2'-3' severe chop, small craft advisory.<br>- Weather(pm): temp. 40°F, winds out of NW @ 20 mph<br>- Waited throughout the day for the weather to improve, however there was little improvement therefore we did not steam into position |

| Date | Activity |
|---|---|
| November 8<br>Sunday | - Surveyors, Geologist, and Drillers onsite 6:30am-4:30pm<br>- Weather (am) temp. 50°F, winds light SW, waves 1'-1.5'<br>- Weather (pm) temp. 50°F, winds 15-20 mph, 2'-3' waves<br>- Arrived at Lighthouse Marina, set out boring markers for FD-G, started drilling at 9:30 advanced hole to 32 ft when it was necessary to discontinue drilling in PM due to rough water, stayed on position until 4:30pm waiting for the waves to calm. The waves were causing the barge to move up and down about 1 ft. Therefore, it was extremely difficult to drive casing safely. Could not spin casing due to up and down movement. |
| November 9<br>Monday | - Surveyors, Geologist, & Drillers on-site 6:30am-3:30pm<br>- Weather: temp. 40°F, winds SW-W, 20+ mph, waves 2 - 3 ft.<br>- Arrived onsite (Lighthouse Marina) Surveyors tried to set markers however water was too rough for small boat, therefore they had to turn back<br>- Boat and barge steamed into position however surveyors could not get on breakwater to position the barge. Barge was secured to boat in an attempt to stabilize the barge to prevent up and down movement. Did not substantially damper the vertical movement. Using this approach, the spuds could not be used and we had to use anchors to hold us in position. Even with 8 anchors out, the tide and current made it very difficult to stay on location.<br>- Winds & waves same throughout day |
| November 10<br>Tuesday | - Surveyors, Geologist, and Drillers on-site 6:00am-2:30pm<br>- Weather: temp. 30°F winds NW to NE at 15-20 mph, waves 2+ft.<br>- Surveyors went to the Light House Marina, waters looked marginal; the decision was made to try drilling. The boat and barge steamed into position<br>- Tried to set bouys, water extremely rough and Surveyors could not get on survey station at the breakwater<br>- Boat and Barge returned back to Ferry Street Bridge<br>- Called Canton Office and discussed with Spencer Thew, problem and progress, weather forecast, and past years records regarding wind volocity. Began to make attempt to obtain historical wind information. It appeared that we may have to take a new approach to drilling at this time of year<br>- Spent afternoon looking for larger barge with heavier duty spuds or jack up barge. Canton Office assisted in this effort. A large spud barge ~100' x 30'x 7' with crane was located in Boston, however it was not available for 3 to 4 weeks. Could not locate a jack up barge that would be available this year. |

| Date | Activity |
| --- | --- |
| November 11<br>Wednesday | - Surveyors, Geologist, and Drillers onsite 6:30am-4:00pm<br>- Weather: Winds out of NW At 25 mph and waves 2.5' to 3', temp. 30-50°F, small craft advisory in Long Island Sound<br>- Tried to set bouys, however weather extremely bad, had to turn back, Boat and Barge came out to channel and got secured in general location of boring. When surveyors could not position barge, we turned back and returned to Ferry St. Dock<br>- Spencer Thew in Canton Office made the decision to temporarily discontinue work until we could improve methodology.<br>- Made arrangements for crane to unload drill rig<br>- Drillers, and ship crew began unloading drill rig & equipment from barge |
| November 12<br>Thursday | - Surveyors, Geologist, and Drillers on-site 7:00am-1:00pm<br>- Finished unloading barge, performed clean up<br>- Started demobilizing barge |
| November 13<br>Friday | - Barge demobilized |

TABLE IIA

CD024 - NEW HAVEN, CT

**TELEPHONE LOG**
**FOR**
**SEISMIC SURVEY**

| Date | Conversation |
|---|---|
| July 29<br>Wednesday | - J. Thew to Paul L'Heureux Corps of Engineers<br>  - Discussed our procedures to record the Seismic Data and establish horizontal positioning of the boat equipped with Seismic equipment<br>  - Paul requested that J. Thew visit the Corps to obtain information the Corps had on radio navigation equipment and review the Corps procedure<br>- S. Thew visited the Corps office in Waltham, MA, in the afternoon |
| July 30<br>Thursday | - S. Thew called the Corps of Engineers to discuss the use of radio navigation equipment. ATL is trying to make arrangements to subcontract the horizintal positioning to a firm from the west coast<br>- S. Thew then talked to Paul Fiske of Weston Geophysical who indicated they could use their radio navigation equipment. Arrangments were made to use Weston's equipment |
| July 31<br>Friday | - S. Thew to Paul Fiske, Weston Geophysical regarding procedures for horizontal positioning of seismic survey by using radio navigation equipment.<br>  - Weston Geophysical is scheduled to mobilize Tuesday August 4th<br>- J. Thew contacted Petty Officer Hitchcock, U.S. Coast Guard 203/773-2464, regarding clearance into shipping channel<br>- J. Thew tried to contact Larry Williams regarding boat for surveyors (203/878-9395)<br>- J. Thew to Paul Fiske of Weston Geophysical to discuss the procedures involved in collection of Seismic Data<br>  Reflection - Two Methods<br>  1) Boomer Board - has transducer that produces a knocking sound<br>  2) Sparker - sends down electric charge<br>  Refraction -<br>  Use a 40 cubic inch air gun set 5-7 feet below the water surface, air is discharged from the gun and the shock waves are transmitted to determine Seismic Data<br>  - These Methods are all environmentally safe; they were designed with water life in mind<br>- J. Thew to Petty Officer Hitchock of U.S. Coast Guard regarding clearance into the shipping channel, instructed to call Chief Kurowski Monday morning 8:00 am |

| Date | Conversation |
| --- | --- |
| August 3<br>Monday | J. Thew to Ed Rostowsky of Weston Geophysical<br>- Jim Thew needed information for the U.S. Coast Guard regarding the boat being used for seismic work<br>- Needed to know where Weston Geophysical would dock the boat<br>- Ed Rostosky told J. Thew to call back in the afternoon and he would have the information<br>- Chief Kurowski of U.S. Coast Guard needs information on boat being used; would like to know dates & times<br>- Informed him ATL would be starting the project on August 5th (Wednesday)<br>- Ed Rostosky saw no problem with starting on Wednesday August 5th<br>- J. Thew to Ed Rostosky<br>Boat Description:<br>31' White Fiberglass<br>Lobster Boat<br>"Phantom" 905254<br>Weston will set trisponders at two locations for the entire job<br>1) West Breakwater<br>2) Sewage Disposal<br>3) STA #16 to calibrate trisponder<br>- ATL will take care of tide information:<br>Need times of high and low tide<br>Record times of every seismic shot |
| August 4<br>Tuesday | - J. Thew to Ed Rostosky, Weston Geophysical<br>- Ed was checking out navigation equipment<br>- J. Thew informed Ed Rostosky of location of a slip for their boat at Oyster Point Marina<br>- Weston had a problem with the navigation equipment, would call J. Thew by 5:30 pm to inform if they would be mobilizing Wednesday or if they had to send equipment for repair<br>- J. Thew to Paul L'Heureux to inform Paul of our progress; J. Thew left message since Paul was not in his office.<br>- Ed Rostosky, Weston Geophysical to J. Thew is going to rent navigation equipment since they were having difficulties with their equipment. |

| Date | Conversation |
|---|---|
| August 5<br>Wednesday | - J. Thew (ATL) to U.S.G.S. gave information of Benchmark #22 at corner of Howard Street and Fifth Street<br>- J. Thew to U.S.C.E. Office told them of our progress on the job. Left message since Paul L'Heureux was not in the office.<br>- Dave Strack Telecon w/U.S.G.S. in Missouri<br>They told him to call National Geodetic Survey at 301/443-8631<br>- David Strack telecon with National Geodetic Survey<br>They told him to call the Connecticut Department of Natural Resources at 203/566-3540 (Sid Quarrier)<br>- Dave Strack telecon with Connecticut Department of Natural Resources<br>They told Dave to contact Connecticut Department of Transportation<br>- David Strack telecon with Connecticut National Resources Center - They told him to contact Connecticut Dept. of Transportation, the Mapping & Survey Department at 203/566-4638<br>- They have the elevation and will send TM64, TM65 and TM66, we will need TM65<br>- Will mail copies to ATL in Canton and to our motel<br>- Also, sending conversion chart of Mean Sea level to Mean Low Water |
| August 6<br>Thursday | - J. Thew (ATL) to Ed Rostosky (Weston Geophysical) - Ed informed J. Thew of the status of the navigation equipment and that Weston would not be prepared to begin until Saturday, August 9.<br>- S. Thew (ATL) to J. Thew (ATL), asked J. Thew to call Weston and the Corps and delay the start until Monday morning, August 10.<br>- J. Thew to Ed Rostosky, Weston Geophysical asked him if he would delay start until Monday, August 10, he thought it would be a good idea<br>- J. Thew to Paul L'Heureux, Corps of Engineers told him about navigation equipment problems and delaying the start until August 10.<br>- J. Thew to Oyster Point Marina; checked to be sure we would have a slip for boat on Sunday, August 9. |
| August 10<br>Monday | - J. Thew (ATL) to Corps of Engineers (Paul L'Heureux); called to report status of job - Paul not in his office |
| August 11<br>Tuesday | - J. Thew (ATL) to Corps of Engineers (Paul L'Heureux) informed him that we were working; he told me to contact Yuri Yatsevitch from now on until completion of project |
| August 12<br>Wednesday | - J. Thew (ATL) to Corps of Engineers (Yuri Yatsevitch)<br>- Left message regarding progress, Yuri was not in the office.<br>- J. Thew to Shirley at ATL.<br>- We called in our data and Shirley fed it into the computer and gave us coordinates for Beacon and location of seismic points<br>- Talked with Spencer on progress of job |

| Date | Conversation |
| --- | --- |
| August 13 | - J. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers)<br>  - Reported progress to date and problems we had encountered.<br>  - Yuri told me to make sure problems were documented |
| August 14<br>Friday | - J. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers)<br>  - Yuri was not in the office, left message that we called to report progress. |
| August 15<br>Saturday | - No calls were made |
| August 16<br>Sunday | - No calls were made |
| August 17<br>Monday | - J. Thew (ATL) to Ron DeFilippo (Corps of Engineers)<br>  - Informed him that the refraction work would be done Tuesday August 18 and Reflection should be done by Friday August 21st<br>  - He wanted to know when the drilling would start<br>  - The contract reads after the Corps has reviewed seismic data, the drilling would then start |
| August 18<br>Tuesday | - J. Thew (ATL) to Corps of Engineers<br>  - Ron DeFilippo and Yuri Yatsevitch were not in the office<br>  - Left a message that refraction was done and the reflection gear was being put on board and the job should be done Friday, maybe Saturday. |
| August 19<br>Wednesday | - No calls were made |
| August 20<br>Thursday | - No calls were made |
| August 21<br>Friday | - J. Thew (ATL) to Corps of Engineers<br>  - Tried to reach Ron DeFilippo, was not in the office<br>  - Left message that the job was nearly complete<br>  - Told them I would call in Monday August 24, 1987 |
| August 22<br>Saturday | - No calls were made |

TABLE IIB

CD024 - NEW HAVEN, CT

## TELEPHONE LOG FOR SUBSURFACE EXPLORATION

| Date | Conversation |
|---|---|
| October 30 Friday | - G. Hargrave (ATL) to Corps of Engineers<br>- Received the following information from Steve Johnson, Surveying Manager - Corps phone (617) 647-8527<br>- Elevation Sta #199 4.388' mean sea level<br>- Convert to mean low water - add 2.4'<br>- Conversion of 2.4' is given by NOAA and differs from previous figures from Conn. DOT by 0.2' - Conn. DOT 2.2'<br>- We will use 6.8' for Elevation of Sta #199<br>- BM #4 on U.S.G.S. Map means aproximately 4' above mean sea level<br>- If Steve is not in and information is needed, contact Maureen Murray - same number |
| October 31 Saturday | No calls made |
| November 1 Sunday | No calls made |
| November 2 Monday | - S. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers)<br>- Reported progress to date, completed Boring FD-A on Sunday |
| November 3 Tuesday | - G. Hargrave (ATL) to S. Thew (ATL)<br>- After several attempts to position the drill rig, which was prevented due to high winds and waves, G. Hargrave informed S. Thew of the problem. S. Thew requested a three day weather forcast and normal conditions for November in New Haven Harbour.<br>- G. Hargrave called the National Weather Service (1-203-936-1212) and received the following information:<br>11/3 Tuesday, 1'-3' swells, 10-15 mph winds, possible rain<br>11/4 Wednesday 3'-5' swells, 25-30 mph winds<br>11/5 Thursday change to NW winds 10mph<br>- Called Bridgeport Flight Service for one day forecast 1-800-992-7433<br>- Called Weather Surveys - a consultant 1-203-936-1212, could not obtain information since we would have to arrange a contract with them. |
| November 4 Wednesday | - S. Thew (ATL to Yuri Yatsevitch (Corps of Engineers)<br>- Reported that we were not able to work on Tuesday or Wednesday due to severe waves.<br>- Reported that on Monday we had began Boring FD-G, however, were blown off it due to high winds and rising tides. |

| Date | Conversation |
|---|---|
| | - G. Hargrave (ATL) to S. Thew (ATL) 4:30 p.m.<br>- Discussed the problem of high waves; surveyors could not access the control station on the breakwater.<br>- The rough water made driving of casing unsafe on the barge.<br>- Made decision to not work Thursday due to unfavorable weather forecast. |
| November 5<br>Thursday | - S. Thew (ATL) to Corps of Engineers<br>- Left message that we had discontinued work for 1 day due to high winds and rough water |
| November 6<br>Friday | - G. Hargrave (ATL) to S. Thew (ATL)<br>- Reported weather conditions and reported that we would try to work Saturday and Sunday<br>- S. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers)<br>- Notified Yuri that we had remobilized to the job site on Friday, November 6, 1987, however, were again not able to work due to the high waves which generally exceeded 3 ft. I indicated to Yuri that we would attempt to work through the weekend. |
| November 7<br>Saturday | - G. Hargrave (ATL) to S. Thew (ATL)<br>- Could not work due to adverse weather conditions. |
| November 8<br>Sunday | - No calls made |
| November 9<br>Monday | - S. Thew (ATL) to Ron DeFillipo (Corps of Engineers)<br>- Reported that progress was minimal over the weekend.<br>- Indicated that we had attempted to work both Saturday and Sunday, however, could not due to the high southwest winds which were usually in excess of 20 mph creating waves in excess of 3 ft. Ron indicated that he would pass the information on to Yuri who was out of the office on this particular day. |
| November 10<br>Tuesday | - G. Hargrave(ATL) talked to Wally Schicterdecker of Essex Island Marina he has a barge but it is tied up until January, he gave me Ned Libby's name and address.<br>Connecticut River Dock & Dredge<br>P.O. Box 744<br>Essex, CT 06426<br>(203) 526-9656<br>- Talked to Ned Libby's wife Carol Libby and she is going to contact her husband tonight; he will contact us tonight at the motel<br>- Talked to Jeff Shapiro at Cedar Island Marina he does not have barge told us to check with Clinton Yacht Haven, we checked there but no one was there<br>- Called Jim Jenkins from J. W. Jenklin's Inc. (no answer)<br>- Called Norwalk Marina (no answer) |

| Date | Conversation |
|---|---|
| | - ATL Canton Office contacted several Marine contractors, from Boston to N.Y.C. in an attempt to get a larger barge or a jack up barge. No jack up barge could be located and all large barges were committed for at least 1 month. Canton Office located a 100' x 30' x 7', Spud Barge at F. A. Francou, Inc. in Salisbury, Mass. However, earliest available date was late December.<br>- S. Thew (ATL) to Chief Petty Officer Lewis at 10:20 a.m.<br>  - Notified him that we would be working in New Haven Harbor through November 24, 1987, during the hours of 6:00 a.m. to 7:00 p.m.<br>- S. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers) - 2:00 p.m.<br>  - Yuri was not in.<br>- Yuri Yatsevitch (Corps of Engineers) to S. Thew (ATL) - 2:55 p.m.<br>  - S. Thew told Yuri that we had 20+ mph NW winds with 3 ft waves and could not work. Today the area was calmer outside the breakwater with the NW winds than it had been with the SW winds. We are presently looking for a large barge or a jack up barge. Spence is to meet with our Marine Contractor on Wednesday morning to review other alternatives. |
| November 11<br>Wednesday | - S. Thew (ATL) to Marine Contractor<br>  - Marine Contractor recommended larger barge with a crane to lift spuds<br>- G. Hargrave(ATL) talked to S. Thew (ATL) via phone, S. Thew said we must discontinue work until we can improve methodology or the weather improves. The option appears to be a very large barge with heavy duty spuds or a jack up barge |
| November 12<br>Thursday | - S. Thew (ATL) to Yuri Yatsevitch (Corps of Engineers) - told him we had made the decision to temporily discontinue since we could not stabilize barge and survey crew was working under conditions that were marginal and approaching dangerous from the safety aspect. We cannot access the break water when there are small craft advisories. |
| November 13<br>Friday | - G. Hargrave called Bridgeport Airport for weather information, (1-800-992-7433) They said that they keep a hard copy for two weeks, if we want a copy we have to go there to pick it up. |

# Section 6

## CHAIN OF CUSTODY LOG

ATLANTIC TESTING LABORATORIES, Limited

CHAIN OF CUSTODY LOG

PROJECT: New Haven Harbor Improvements
ATL Job No CD024

ITEMS:

Tubes

Bottles

Jar Samples 13

Core Boxes

Sampling Logs 2

| Date & Time Received | Date & Time Transferred | Comments | Custodian |
|---|---|---|---|
| November 1987 | 1/18/88 9:45 AM | AS SAMPLED | Greg Harrison |
| 1/18/88 9:45 AM | 1/20/88 2:25 | — | Jeff King |
| 1/20/88 2:25 | 1/21/88 7:50 A.M. | — | Cliff Jones |
| 1/21/88 | 1/21/88 10:40 AM | | Michael Carroll |
| | | | |
| | | | |

# Section 7

## SAFETY REPORTS

WEEKLY SAFETY MEETING

NEDSO

Date held Oct. 29, 1987

THRU: Area Engineer, NED Area

Time AM

TO: Safety Office, NED

Report No. _____

1. Weekly safety meeting was held this date for the following personnel:

Contract No. /D.O.No. 0022 Contractor Atlantic Testing Laboratories, Ltd.

Conducted By Greg Hargrave All personnel present (Contr) 5
(Sub) -0-
(Govt) -0-

Subjects discussed (Note, delete, or add):
EM 385-1-1, Section: _____

Accident Prevention Plan

✓ Individual Protective Equipment - Hard hat, steel toed shoes

✓ Prevention of Falls - watch slippery surfaces

✓ Back Injury, Safe Lifting Techniques - use legs, not back

Fire Prevention -

✓ Sanitation, First Aid, Waste Disposal - keep work area neat

✓ Tripping Hazards - trash, hose, nails in lumber - "

Staging, Ladders, Concrete Forms, Safety Nets -

✓ Hand Tools, Portable Power Tools, Woodworking Machinery - use proper tools

✓ Equipment Inspection & Maintenance (Zero Defects) -

✓ Hoisting Equipment -

✓ Ropes, Hooks, Chains and Slings - Zero Defects

Electrical Grounding, Temporary Wiring, GFCI -

✓ Lockouts for safe clearance procedures - electrical, pressure, moving parts -

✓ Welding, Cutting - wear eye protection

Excavations -

Loose Rock and Steep Slopes -

Explosives -

✓ Water Safety - wear life jackets, 2 men/boat

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

Prepared by Greg Hargrave Title Geologist

2. Forwarded.

Signature Greg Hargrave
Resident Engineer

CF: EXPOSURE HOURS:
Work Date: 10/28, 10/29, ~~[illegible]~~
Non-work Date: _____

Man Hours:
Contr: _____
Subcontr: _____
Govt: _____
TOTAL: _____

NED APP FL 251

WEEKLY SAFETY MEETING

NEDSO

Date held November 4, 1987

THRU: Area Engineer, NED Area

Time PM

TO: Safety Office, NED

Report No. DO 0022

1. Weekly safety meeting was held this date for the following personnel:

Contract No. /D.O.No. _____ Contractor Atlantic Testing Laboratories, Ltd.

Conducted By G. Hargrave

All personnel present (Contr) 5
(Sub) -0-
(Govt) -0-

Subjects discussed (Note, delete, or add):
EM 385-1-1, Section: _____

Accident Prevention Plan

✓Individual Protective Equipment - hard hat, gloves

✓Prevention of Falls - watch slippery surfaces

Back Injury, Safe Lifting Techniques - use legs

Fire Prevention -

Sanitation, First Aid, Waste Disposal -

✓Tripping Hazards - trash, hose, nails in lumber - keep work area neat

Staging, Ladders, Concrete Forms, Safety Nets -

Hand Tools, Portable Power Tools, Woodworking Machinery -

✓Equipment Inspection & Maintenance (Zero Defects) -

✓Hoisting Equipment -

✓Ropes, Hooks, Chains and Slings - zero defects

Electrical Grounding, Temporary Wiring, GFCI -

Lockouts for safe clearance procedures - electrical, pressure, moving parts -

✓Welding, Cutting - wear proper safety equipment, goggles, gloves leather shoes

Excavations -

Loose Rock and Steep Slopes -

Explosives -

✓Water Safety - 2 men in small boat, both wear life jackets

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

Prepared by G. Hargrave Title Geologist

2. Forwarded.

Signature [illegible]
Resident Engineer

CF: EXPOSURE HOURS:
Work Date: 10/28, 10/29, 10/30, 10/31, 11/1, 11/2, 11/3, 11/4, 11/6, 11/7, 11/8, 11/9
Non-work Date: 11/5

Man Hours:
Contr: 77.75
Subcontr: 77.75
Govt: 0
TOTAL: 155.5 hours

NED APR 82 FL 251

WEEKLY SAFETY MEETING

NEDSO

Date held November 9, 1987

THRU: Area Engineer, NED Area

Time PM

TO: Safety Office, NED

Report No. D.O. 0022

1. Weekly safety meeting was held this date for the following personnel:

Contract No. /D.O.No.

Contractor Atlantic Testing Laboratories, Ltd.

Conducted By Greg Hargrave

All personnel present (Contr) 5
(Sub) -0-
(Govt) -0-

Subjects discussed (Note, delete, or add):
EM 385-1-1, Section:

Accident Prevention Plan

✓ Individual Protective Equipment - gloves, safety shoes, hard hats

✓ Prevention of Falls - use hand railings, watch slippery surfaces

✓ Back Injury, Safe Lifting Techniques - use legs, better yet, use proper equipment

Fire Prevention -

✓ Sanitation, First Aid, Waste Disposal - keep work area neat

✓ Tripping Hazards - trash, hose, nails in lumber - " "

Staging, Ladders, Concrete Forms, Safety Nets -

✓ Hand Tools, Portable Power Tools, Woodworking Machinery - use proper tools, wrenches etc.

✓ Equipment Inspection & Maintenance (Zero Defects) -

✓ Hoisting Equipment -

✓ Ropes, Hooks, Chains and Slings - zero defects

Electrical Grounding, Temporary Wiring, GFCI -

✓ Lockouts for safe clearance procedures - electrical, pressure, moving parts - watch hands around moving parts

✓ Welding, Cutting - wear proper safety equipment to protect eyes + hands

Excavations -

Loose Rock and Steep Slopes -

Explosives -

✓ Water Safety - 2 men to boat, both are to wear life jackets

Toxic materials - hazards, MSDS, respiratory, ventilation -

Other -

Prepared by Greg Hargrave Title Geologist

2. Forwarded.

Signature Gregory P. Hargrave
Resident Engineer

CF: EXPOSURE HOURS:
Work Date: 10/10, 11/11, 11/12
Non-work Date:

Man Hours:
Contr: 58
Subcontr: 58
Govt: -0-
TOTAL: 116

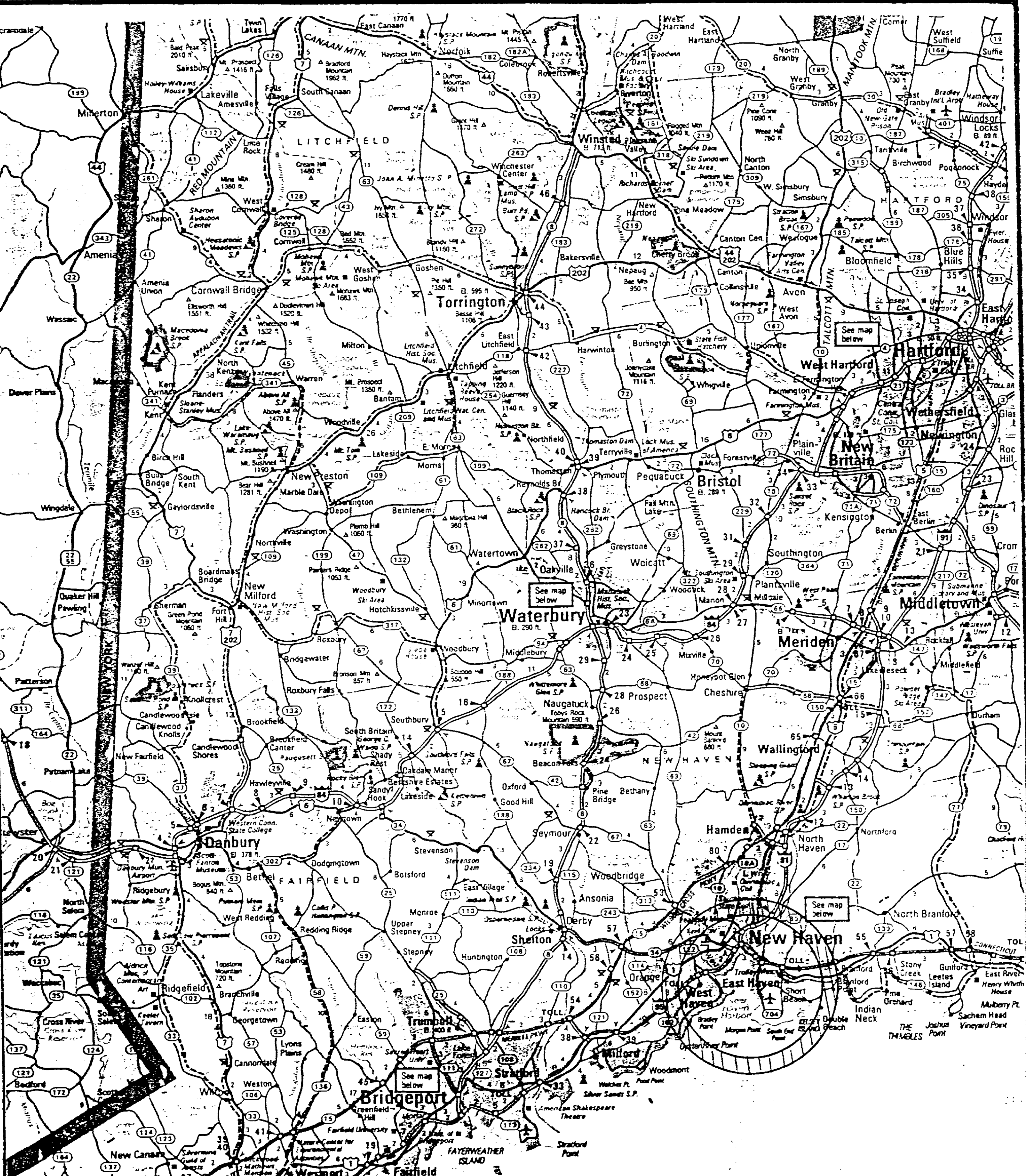
NED APR 82 FL 251

# Section 8

## FIELD INSPECTOR'S LOGS

a. Figure 1 - General Project Map

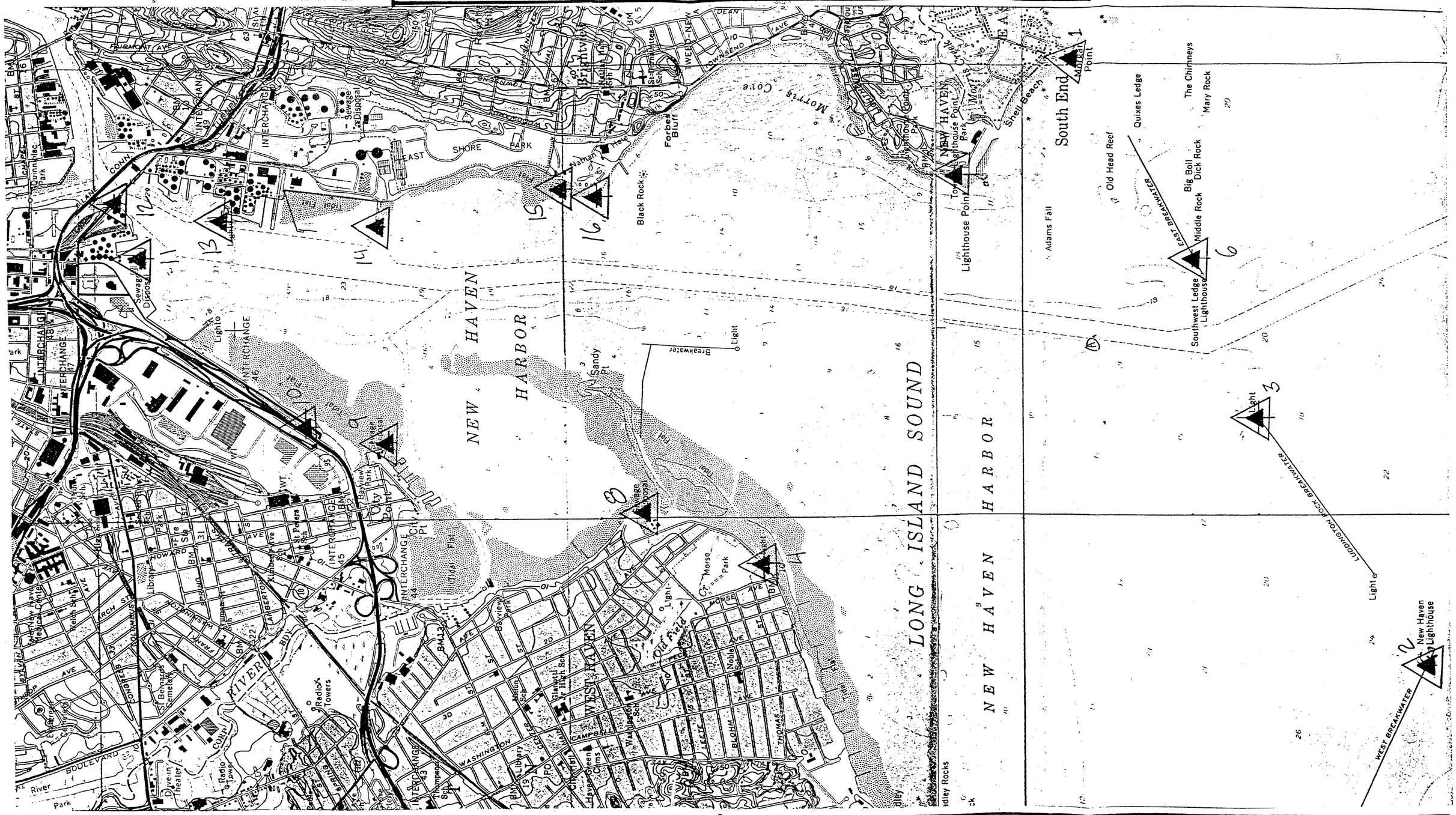
# GENERAL PROJECT MAP



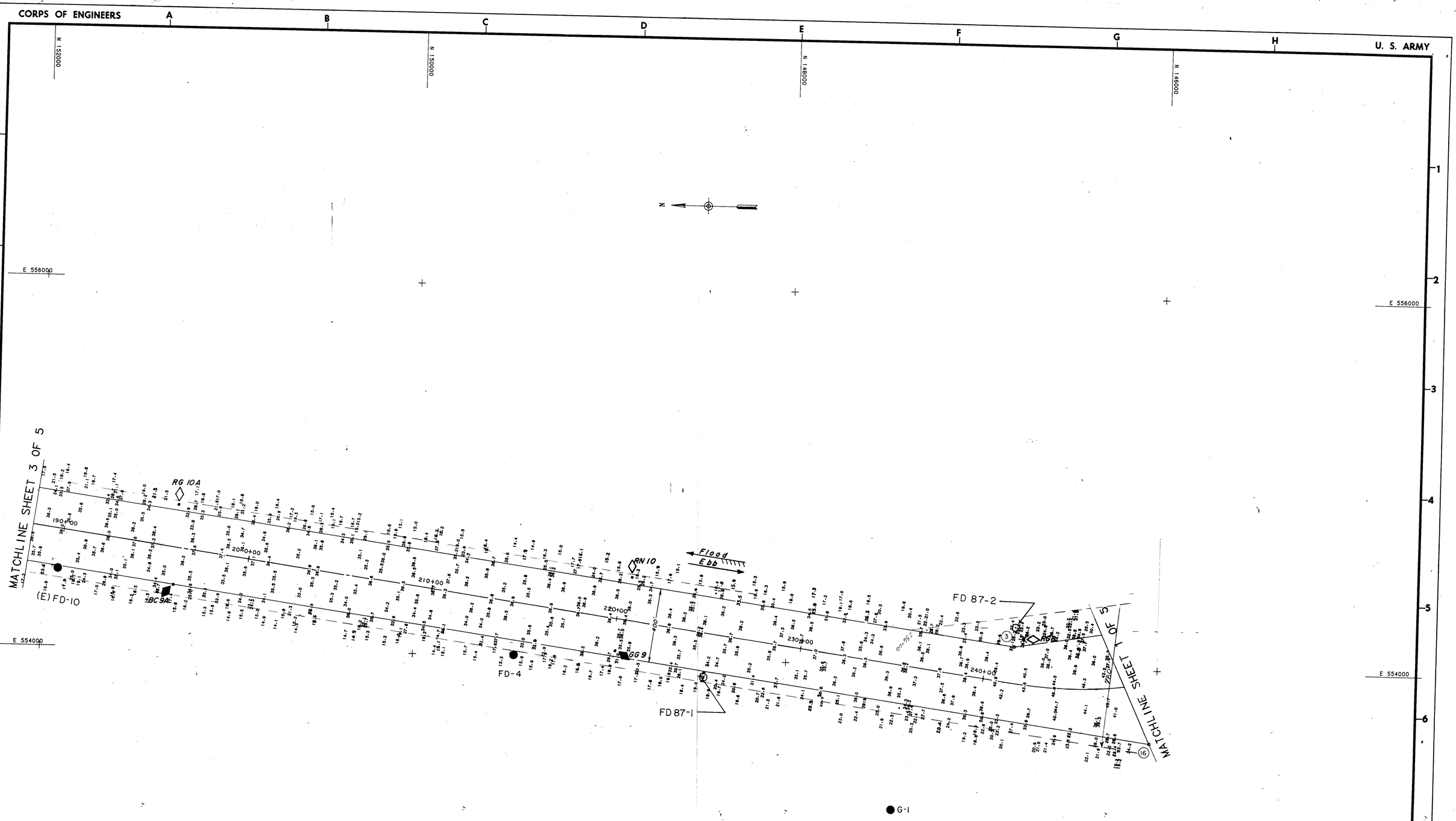

| | | |
|---|---|---|
| **PROJECT No** CD024 | ***SCALE:*** NONE | New Haven, Connecticut |

b. Figure 2 - Site Location Map

# SITE LOCATION MAP




| PROJECT No. | SCALE: | U.S.G.S. QUADRANT: |
|---|---|---|
| CD024 | 1:24000 | New Haven and Woodmont, Connecticut |




NOTE : For general notes see sheet 1 of 5

BORING LOCATIONS:

+ ACTUAL

⊙ PROPOSED

GRAPHIC SCALE

1"=200FT. 200' 0' 200' 400'

| REVISION | DATE | DESCRIPTION | BY |
|---|---|---|---|

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS.

DES. BY D.M.K. | DR. BY E.J.K. | CK. BY

SUBMITTED: PROJECT MANAGER

REVIEWED: CHIEF, COAST. ENGINEERING SECT.

APPROVAL RECOMMENDED: CHIEF, DESIGN BRANCH

# NEW HAVEN HARBOR
NEW HAVEN CONN.

Proj. No. 139.02

APPROVED CHIEF, ENGINEERING DIVISION

DATE 1987

SCALE: 1"=200' | SPEC. NO. DACW 33

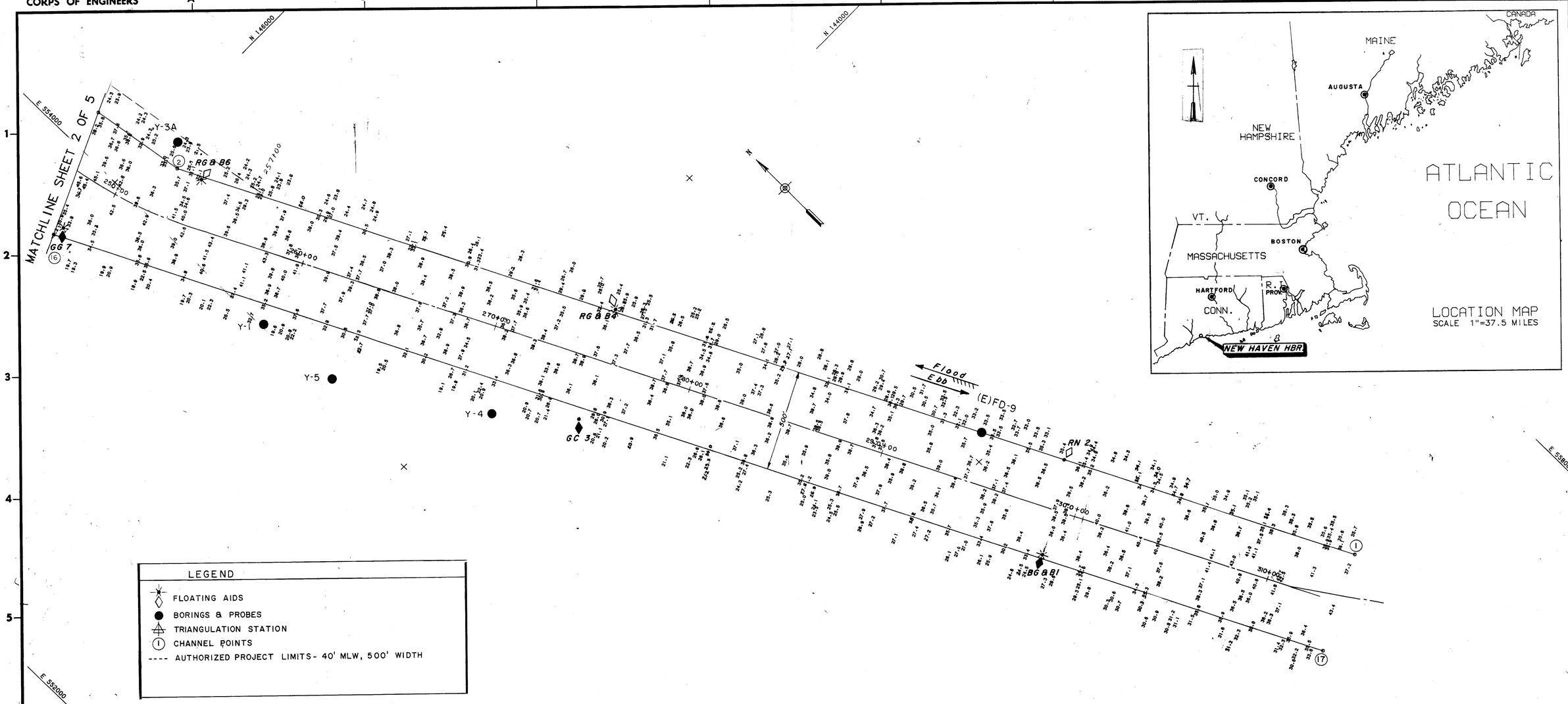
DRAWING NUMBER N.H. 886

SHEET 2 of 5

See NOAA Chart No. 12371

CORPS OF ENGINEERS

U. S. ARMY




LEGEND

- FLOATING AIDS
- BORINGS & PROBES
- TRIANGULATION STATION
- CHANNEL POINTS
- ---- AUTHORIZED PROJECT LIMITS- 40' MLW, 500' WIDTH

INDEX OF FLOATING AIDS

| NO. | DATE | STATE PLANE COORDINATES | GEOGRAPHIC POSITION | NO. | DATE | STATE PLANE COORDINATES | GEOGRAPHIC POSITION |
|---|---|---|---|---|---|---|---|
| BG&B1 | 03-07-85 | N 141,453.0 E 555,895.0 | 41°-13'-17.2"N 72°-54'-37.1"W | RG 2 | 02-20-85 | N167,250.0 E555,235.0 | 41°-17'-32.1"N 72°-54'-46.4"W |
| RN 2 | 03-07-85 | N141,708.0 E556,302.0 | 41°-13'-19.7"N 72°-54'-31.8"W | BC1 | 02-20-85 | N166,969.0 E555,204.0 | 41°-17'-29.3"N 72°-54'-46.8"W |
| RG&B4 | 03-07-85 | N143,802.0 E555,285.0 | 41°-13'-40.4"N 72°-54'-46.2"W | [illegible] | 02-20-85 | N163,391.0 E554,197.0 | 41°-16'-53.9"N 72°-55'-00.0"W |
| GC3 | 03-07-85 | N143,551.0 E554,773.0 | 41°-13'-37.9"N 72°-54'-51.9"W | RN16 | 02-21-85 | N160,184.0 E555,686.0 | 41°-16'-22.3"N 72°-54'-40.3"W |
| RG&B6 | 03-07-85 | N145,706.0 E554,314.0 | 41°-13'-59.2"N 72°-54'-57.9"W | [illegible] | 02-21-85 | N159,746.0 E555,223.0 | 41°-16'-17.9"N 72°-54'-46.4"W |
| GG 7 | 03-07-85 | N146,023.0 E553,667.0 | 41°-14'-02.3"N 72°-55'-06.4"W | RB14 | 02-21-85 | N156,625.0 E555,323.0 | 41°-15'-47.1"N 72°-54'-45.0"W |
| RG 8 | 03-07-85 | N148,719.0 E554,158.0 | 41°-14'-08.2"N 72°-55'-00.0"W | GC13 | 02-21-85 | N156,641.0 E554,968.0 | 41°-15'-47.3"N 72°-54'-49.6"W |
| [illegible] | [illegible] | N148,912.0 [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| RN 10 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| BC 8A | 03-07-85 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

GENERAL NOTES :

*Soundings are in feet and tenths and are referred to the plane of Mean Low Water (MLW).*

*Bench Mark Data: B.M. is a brass Coast Guard disk 6" below ground on the westerly side of the New Haven Coast Guard station, disk is protected by a 12" square block cover. It is 35.00 ft. and 58.65 ft. respectively from the north westerly and south westerly corners of the Coast Guard building. It is also 4.65 ft. from the west edge of the sidewalk.*

*Elevation is 15.06 above MLW.*

*Field Books: [illegible] 4231.*

*Depth[illegible]: 85-22, thru 85-24.*

[illegible]

*System [illegible] these maps [illegible]*

*[illegible] the "shoalest" [illegible] Feb. & Mar. 198[illegible]*

| REVISION | DATE | DESCRIPTION | BY |
|---|---|---|---|

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WASTHAM, MASS.

NEW HAVEN HARBOR
NEW HAVEN CONN.

c. Figure 3 - Boring Location Plan

## d. Boring Logs

| Site | Boring No | Page 3 of 3 |
|---|---|---|
| New Haven Conn | FD-87-2 | |

| DEPTH | 1"-2' | CORE/SAMPLE NO | SIZE | DEPTH RANGE | BLOWS PER FT / CORE REC'VY | 6" SAMPLING AND CORING OPERATIONS | CLASSIFICATION OF MATERIALS |
|---|---|---|---|---|---|---|---|
| 28.3 | | | | | | | |
| | | | | | 2 | Sampled | Similar Soil |
| | | | | | 4 | | |
| | | S-3 | | | 4 | | |
| 30' 30.3' | | | | | 5 | | |
| | | | | | 4 | Sampled | |
| | | | | | 7 | Advanced AX casing to 32.3' | Grey cmf SAND; trace GRAVEL, trace SILT; trace organics, trace shells, SW |
| | | S-4 | | | 8 | Advanced roller bit to 32.3' | |
| 32' 32.3' | | | | | 13 | | |
| | | | | | 12 | Sampled | |
| | | S-5A | | | 20 | | Similar Soil |
| | | | | | 61 | | Brown cmf SAND; little GRAVEL, trace SILT SW |
| 34' 34.3' | | S-5B | | | 24 | Exploration Terminated 11/2/87 | |
| 36' | | | | | | | |
| 38' | | | | | | | |
| 40' | | | | | | | |
| 42 | | | | | | | |
| 44' | | | | | | | |
| 45' | | | | | | | |

FBA(Test)

Boring No FD 87-2

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

# FIELD LOG OF TEST BORING

PROJECT NO. D.O. 0022

Site New Haven Conn — Page 1 of 3 Pages

Hole No. FD87-1 Diam. (Casing) _____ — Boring Started November 1, 1987

Co-ordinates: N 148456 E 553919 — Boring Completed November 1, 1987

Drilled by Cambridge + Garden — Report Submitted _____

Purpose of Exploration Determine Dredging Conditions for channel deepening to 42' MLW and widening from 400 ft to 500 ft

Elevation Top of Hole 30.8 below MLW M.S.L.
Total Overburden Drilled 14.2 Feet
Elevation Top of Rock NA M.S.L.
Elevation Bottom of Hole 45 below MLW M.S.L.
Total Rock Drilled 0 Feet
Total Depth of Hole 14.2 Feet
Core Recovered — %
Core Recovered — Ft.: — Diam. — In.
Soil Samples 2 In. Diam. 7 No.
Soil Samples _____ In. Diam. _____ No.

Casing Left in Place 0' Feet

Water Table Depth NA

| Depth From | Depth To | Method of Drilling and Type of Bit Used |
|---|---|---|
| 30.8' | 41 | HX casing advanced with 300 lbs hammer |
| 30.8 | 45 | Continuous split spoon sampling (spoon advanced with 140 lbs hammer) |

INDEX

Ground Water _____ Back of Page _____
Boring Location Sketch _____ Back of Page _____
Overburden Record _____ Page _____
Rock Drilling _____ Page _____
_____ Page _____
_____ Page _____
_____ Page _____

Prepared by Greg Hargrave — Field Data — Lab. Data

Submitted by Atlantic Testing Lab

NED FORM DEC 63 121 — REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

# FIELD LOG OF TEST BORING

Site New Haven Conn Page 2 of 3 Pages

Boring No. FD-87-1 Desig. _____ Diam. (Casing) _____

Co-ordinates: N 148456 E 553919

Elevation Top of Boring 30.8' below MLW M.S.L.
Total Overburden Drilled 14.2' Feet
Elevation Top of Rock NA M.S.L.
Total Rock Drilled 0 Feet
Elevation Bottom of Boring 45' below MLW M.S.L.
Total Depth of Boring 14.2 Feet
Core Recovered — % No. Boxes —
Core Recovered — Ft : — Diam. — In.
Soil Samples 2 In. Diam. 7 No.
Soil Samples _____ In. Diam. _____ No.

Hammer Wt. 140 Boring Started 11-1-87
Hammer Drop 30" Boring Completed 11-1-87
Casing Left 0'
Subsurface Water Data NA Page _____
Obs. Well NA
Drilled By Cambridge + Gorden
Mfg. Des. Drill CME 45
Inspected By: Greg Hargrave
Classification By: Al Brown
Classification By: Greg Hargrave

| DEPTH | 1"= | CORE/SAMPLE NO. | SIZE | DEPTH RANGE | BLOWS PER FT. / CORE RECVY | 6" SAMPLING AND CORING OPERATIONS | CLASSIFICATION OF MATERIALS |
|---|---|---|---|---|---|---|---|
| 0' | | | | | | | |
| 10' | | | | | | | |
| 20' | | | | | | | |
| 30' | | | | | | | |
| 30.8' | | S-1 | | | W O R 1 1 2 5 | Sampled using 1 3/8 "I.D. Split spoon from 30.8 to 33.5 Advanced HX casing to 33.5 using a 300 lbs hammer cleaned casing to 33.5 using wet rotory drill | Grey m f SAND; trace SILT; trace organic material, trace shell fragments SW |
| 32' | | | | | | | |
| 34' | | S-2 | | | 20 10 2 1 | Sampled from 33.5' to 35.5' | Similar Soil |
| 36' | | S-3 | | | 5 1 2 | Sampled from 35.5' to 37.5 advanced and cleaned casing to 37.5' | Similar Soil |

GENERAL REMARKS:
Scale - 1'-30'; 1" = 10'
30'-45; 1" = 2'

N D FORM 58 (Test) MAR 71

Boring No. FD87-1

| Site | Boring No. | Page 3 of 3 |
|---|---|---|
| New Haven, Conn | FD87-1 | |

| DEPTH | | CORE/SAMPLE NO. | SIZE | DEPTH RANGE | BLOWS PER 6" / CORE REC'VY | 6" SAMPLING AND CORING OPERATIONS | CLASSIFICATION OF MATERIALS |
|---|---|---|---|---|---|---|---|
| 37.5 | | | | | 1 | | |
| 38 | | S-4 | | | 4<br>3<br>5 | Sampled | Similar Soil |
| 39 | | | | | | | |
| 40 | | S-5 | | | 9<br>6<br>9<br>10 | Sampled<br>Advanced casing to 41'<br>Wet rotary drilling to 41' | Similar Soil, little shells |
| 41 | | | | | | | |
| 42 | | S-6 | | | 8<br>4<br>7<br>6 | Sampled | Similar Soil; trace fine GRAVEL |
| 43 | | | | | | | |
| 44 | | S-7 | | | 4<br>4<br>3<br>3 | Sampled<br>Boring Terminated 11/1/87 @ 45' below MLW | |
| 45 | | | | | | | |

## Section 9

OTHER REPORTS TAKEN

a. Weather Data
b. Survey Data
c. Tidal Elevations

a. Weather data

# METEOROLOGICAL DATA FOR 1986

BRIDGEPORT, CONNECTICUT

LATITUDE: 41°10' N LONGITUDE: 73°08' W ELEVATION: FT. GRND 7 BARO 28 TIME ZONE: EASTERN WBAN: 94702

| | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC | YEAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TEMPERATURE °F:** | | | | | | | | | | | | | |
| Averages | | | | | | | | | | | | | |
| -Daily Maximum | 38.0 | 34.8 | 49.2 | 58.7 | 70.5 | 76.6 | 80.7 | 78.1 | 72.4 | 63.1 | 50.7 | 41.9 | 59.6 |
| -Daily Minimum | 23.1 | 23.5 | 30.5 | 42.4 | 51.7 | 57.0 | 65.5 | 63.2 | 57.0 | 45.4 | 33.8 | 29.1 | 43.5 |
| -Monthly | 30.6 | 29.2 | 39.9 | 50.6 | 61.1 | 66.8 | 73.1 | 70.7 | 64.7 | 54.3 | 42.3 | 35.5 | 51.6 |
| -Monthly Dewpt. | | | | | | | | | | | | | |
| Extremes | | | | | | | | | | | | | |
| -Highest | 54 | 49 | 73 | 72 | 88 | 89 | 94 | 86 | 82 | 83 | 65 | 58 | 94 |
| -Date | 18 | 2 | 31 | 30 | 31 | 23 | 7 | 9 | 30 | 1 | 9 | 3 | JUL 7 |
| -Lowest | 4 | 13 | 11 | 33 | 36 | 44 | 52 | 46 | 45 | 33 | 20 | 15 | 4 |
| -Date | 15 | 26 | 8 | 13 | 4 | 3 | 4 | 30 | 17 | 31 | 14 | 14 | JAN 15 |
| **DEGREE DAYS BASE 65 °F:** | | | | | | | | | | | | | |
| Heating | 1060 | 997 | 772 | 425 | 174 | 41 | 3 | 23 | 68 | 345 | 673 | 908 | 5489 |
| Cooling | 0 | 0 | 0 | 0 | 60 | 103 | 263 | 204 | 66 | 18 | 0 | 0 | 714 |
| **% OF POSSIBLE SUNSHINE** | | | | | | | | | | | | | |
| **AVG. SKY COVER (tenths)** | | | | | | | | | | | | | |
| Sunrise - Sunset | 6.1 | 7.1 | 5.2 | 6.4 | 5.5 | 5.8 | 7.0 | 6.7 | 7.1 | 5.6 | 7.3 | 6.6 | 6.4 |
| Midnight - Midnight | | | | | | | | | | | | | |
| **NUMBER OF DAYS:** | | | | | | | | | | | | | |
| Sunrise to Sunset | | | | | | | | | | | | | |
| -Clear | 6 | 6 | 12 | 7 | 9 | 6 | 6 | 7 | 5 | 11 | 6 | 7 | 88 |
| -Partly Cloudy | 9 | 4 | 9 | 8 | 14 | 14 | 9 | 7 | 8 | 9 | 7 | 9 | 107 |
| -Cloudy | 16 | 18 | 10 | 15 | 8 | 10 | 16 | 17 | 17 | 11 | 17 | 15 | 170 |
| Precipitation .01 inches or more | 8 | 13 | 9 | 12 | 9 | 14 | 9 | 13 | 10 | 8 | 11 | 12 | 128 |
| Snow, Ice pellets 1.0 inches or more | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 7 |
| Thunderstorms | 0 | 0 | 0 | 0 | 1 | 4 | 2 | 4 | 1 | 0 | 1 | 0 | 13 |
| Heavy Fog, visibility 1/4 mile or less | 4 | 1 | 2 | 2 | 4 | 3 | 1 | 0 | 1 | 0 | 1 | 2 | 21 |
| Temperature °F | | | | | | | | | | | | | |
| -Maximum | | | | | | | | | | | | | |
| 90° and above | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 |
| 32° and below | 9 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |
| -Minimum | | | | | | | | | | | | | |
| 32° and below | 26 | 25 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 24 | 102 |
| 0° and below | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **AVG. STATION PRESS. (mb)** | | | | | | | | | | | | | |
| **RELATIVE HUMIDITY (%)** | | | | | | | | | | | | | |
| Hour 01 | | | | | | | | | | | | | |
| Hour 07 (Local Time) | 68 | 73 | 71 | 69 | 75 | 79 | 86 | 85 | 84 | 81 | 80 | 75 | 77 |
| Hour 13 | 53 | 61 | 49 | 54 | 59 | 60 | 67 | 66 | 62 | 56 | 62 | 62 | 59 |
| Hour 19 | 62 | 66 | 56 | 63 | 65 | 69 | 77 | 75 | 74 | 68 | 68 | 67 | 68 |
| **PRECIPITATION (inches):** | | | | | | | | | | | | | |
| Water Equivalent | | | | | | | | | | | | | |
| -Total | 2.66 | 3.05 | 2.32 | 1.65 | 0.41 | 3.16 | 5.74 | 2.43 | 0.85 | 2.14 | 4.91 | 4.41 | 33.73 |
| -Greatest (24 hrs) | 0.85 | 0.74 | 1.23 | 0.47 | 0.15 | 1.06 | 2.49 | 0.70 | 0.39 | 1.06 | 1.27 | 1.54 | 2.49 |
| -Date | 26-27 | 17-18 | 14-15 | 21 | 20-21 | 6- 7 | 26-27 | 10-11 | 20-21 | 3- 4 | 18-19 | 18-19 | JUL 26-27 |
| Snow, Ice pellets | | | | | | | | | | | | | |
| -Total | 2.0 | 11.0 | T | T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 3.3 | 18.1 |
| -Greatest (24 hrs) | 2.0 | 4.5 | T | T | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 1.4 | 4.5 |
| -Date | 27-28 | 7- 8 | 12 | 11 | | | | | | | 18-19 | 11 | FEB 7- 8 |
| **WIND:** | | | | | | | | | | | | | |
| Resultant | | | | | | | | | | | | | |
| -Direction (!!!) | | | | | | | | | | | | | |
| -Speed (mph) | | | | | | | | | | | | | |
| Average Speed (mph) | | | | | | | | | | | | | |
| Fastest Obs. 1 Min. | | | | | | | | | | | | | |
| -Direction (!!!) | 26 | 33 | 22 | 07 | 29 | 08 | 22 | 08 | 33 | 30 | 23 | 09 | 22 |
| -Speed (mph) | 35 | 28 | 35 | 33 | 24 | 32 | 30 | 28 | 28 | 25 | 30 | 30 | 35 |
| -Date | 6 | 25 | 19 | 16 | 2 | 12 | 26 | 18 | 16 | 6 | 26 | 2 | MAR 19 |
| Peak Gust | | | | | | | | | | | | | |
| -Direction (!!!) | W | NW | W | E | NW | | SW | NW | NW | NW | SW | | |
| -Speed (mph) | 46 | 37 | 47 | 44 | 36 | 41 | 41 | 40 | 40 | 41 | 40 | 45 | 47 |
| -Date | 6 | 25 | 11 | 16 | 4 | 29 | 26 | 24 | 16 | 6 | 26 | 25 | MAR 11 |

(!!!) See Reference Notes on Page 68

# METEOROLOGICAL DATA FOR 1985

BRIDGEPORT, CONNECTICUT

LATITUDE: 41°10' N LONGITUDE: 73°08' W ELEVATION: FT. GRND 7 BARO 00028 TIME ZONE: EASTERN WBAN: 94702

| | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC | YEAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TEMPERATURE °F: | | | | | | | | | | | | | |
| Averages | | | | | | | | | | | | | |
| -Daily Maximum | 33.5 | 39.4 | 50.5 | 58.9 | 70.0 | 74.0 | 81.6 | 80.2 | 75.0 | 64.5 | 53.2 | 38.1 | 59.9 |
| -Daily Minimum | 18.9 | 25.1 | 33.0 | 42.7 | 51.8 | 57.2 | 65.6 | 65.3 | 58.2 | 47.5 | 40.0 | 24.7 | 44.2 |
| -Monthly | 26.2 | 32.3 | 41.8 | 50.8 | 60.9 | 65.6 | 73.6 | 72.8 | 66.6 | 56.0 | 46.6 | 31.4 | 52.1 |
| -Monthly Dewpt. | | | | | | | | | | | | | |
| Extremes | | | | | | | | | | | | | |
| -Highest | 52 | 62 | 74 | 80 | 84 | 85 | 87 | 92 | 90 | 77 | 67 | 54 | 92 |
| -Date | 2 | 25 | 28 | 26 | 11 | 10 | 30 | 15 | 4 | 10 | 20 | 2 | AUG 15 |
| -Lowest | -2 | 6 | 18 | 29 | 36 | 50 | 57 | 58 | 46 | 33 | 29 | 14 | -2 |
| -Date | 21 | 4 | 19 | 10 | 4 | 7 | 24 | 31 | 14 | 30 | 16 | 26 | JAN 21 |
| DEGREE DAYS BASE 65 °F: | | | | | | | | | | | | | |
| Heating | 1197 | 908 | 713 | 423 | 138 | 43 | 0 | 2 | 54 | 278 | 541 | 1032 | 5329 |
| Cooling | 0 | 0 | 0 | 3 | 19 | 71 | 276 | 251 | 110 | 8 | 0 | 0 | 738 |
| % OF POSSIBLE SUNSHINE | | | | | | | | | | | | | |
| AVG. SKY COVER (tenths) | | | | | | | | | | | | | |
| Sunrise - Sunset | 6.4 | 6.2 | 5.7 | 6.3 | 6.7 | 6.6 | 5.7 | 6.4 | 5.4 | 5.6 | 7.7 | 6.0 | 6.2 |
| Midnight - Midnight | | | | | | | | | | | | | |
| NUMBER OF DAYS: | | | | | | | | | | | | | |
| Sunrise to Sunset | | | | | | | | | | | | | |
| -Clear | 7 | 6 | 10 | 5 | 4 | 5 | 8 | 8 | 12 | 13 | 5 | 8 | 91 |
| -Partly Cloudy | 9 | 10 | 9 | 13 | 13 | 12 | 14 | 9 | 7 | 4 | 5 | 10 | 115 |
| -Cloudy | 15 | 12 | 12 | 12 | 14 | 13 | 9 | 14 | 11 | 14 | 20 | 13 | 159 |
| Precipitation .01 inches or more | 12 | 5 | 11 | 11 | 10 | 12 | 9 | 9 | 6 | 7 | 14 | 13 | 119 |
| Snow, Ice pellets 1.0 inches or more | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 8 |
| Thunderstorms | 0 | 0 | 0 | 2 | 2 | 4 | 4 | 1 | 1 | 1 | 0 | 0 | 15 |
| Heavy Fog, visibility 1/4 mile or less | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 0 | 18 |
| Temperature °F | | | | | | | | | | | | | |
| -Maximum | | | | | | | | | | | | | |
| 90° and above | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 3 |
| 32° and below | 11 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 25 |
| -Minimum | | | | | | | | | | | | | |
| 32° and below | 29 | 21 | 16 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 27 | 101 |
| 0° and below | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| AVG. STATION PRESS. (mb) | | | | | | | | | | | | | |
| RELATIVE HUMIDITY (%) | | | | | | | | | | | | | |
| Hour 01 | 71 | 78 | 64 | 73 | 82 | 81 | 79 | 78 | 80 | 79 | 80 | 71 | 76 |
| Hour 07 (Local Time) | 61 | 62 | 49 | 55 | 61 | 63 | 61 | 59 | 58 | 53 | 67 | 54 | 59 |
| Hour 13 | 60 | 67 | 55 | 64 | 70 | 71 | 68 | 68 | 70 | 64 | 77 | 58 | 66 |
| Hour 19 | | | | | | | | | | | | | |
| PRECIPITATION (inches): | | | | | | | | | | | | | |
| Water Equivalent | | | | | | | | | | | | | |
| -Total | 1.25 | 1.72 | 1.93 | 0.69 | 5.11 | 5.34 | 5.19 | 4.62 | 1.60 | 1.48 | 5.67 | 1.25 | 35.85 |
| -Greatest (24 hrs) | 0.37 | 0.93 | 0.93 | 0.40 | 1.52 | 1.24 | 1.63 | 2.43 | 0.62 | 0.58 | 1.66 | 0.54 | 2.43 |
| -Date | 4- 5 | 12 | 11-12 | PM- 1 | 2- 3 | 15-16 | 26-27 | 30-31 | 27 | 5 | 16-17 | 11-12 | AUG 30-31 |
| Snow, Ice pellets | | | | | | | | | | | | | |
| -Total | 11.2 | 6.5 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 3.5 | 22.7 |
| -Greatest (24 hrs) | 5.2 | 3.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.1 | 5.2 |
| -Date | 17 | 2 | 4 | | | | | | | | 26 | 23 | JAN 17 |
| WIND: | | | | | | | | | | | | | |
| Resultant | | | | | | | | | | | | | |
| -Direction (!!!) | | | | | | | | | | | | | |
| -Speed (mph) | | | | | | | | | | | | | |
| Average Speed (mph) | | | | | | | | | | | | | |
| Fastest Obs. 1 Min. | | | | | | | | | | | | | |
| -Direction (!!!) | 32 | 08 | 34 | 27 | 01 | 07 | 23 | 25 | 18 | 25 | 07 | 25 | 18 |
| -Speed (mph) | 29 | 38 | 32 | 32 | 29 | 32 | 29 | 23 | 74 | 26 | 35 | 30 | 74 |
| -Date | 26 | 12 | 6 | 6 | 3 | 5 | 26 | 8 | 27 | 27 | 5 | 27 | SEP 27 |
| Peak Gust | | | | | | | | | | | | | |
| -Direction (!!!) | | E | W | W | NW | NW | SW | NE | NW | N | E | W | |
| -Speed (mph) | 47 | 49 | 51 | 44 | 49 | 48 | 38 | 29 | 31 | 37 | 45 | 49 | 51 |
| -Date | 20 | 12 | 12 | 6 | 18 | 24 | 26 | 31 | 28 | 28 | 5 | 27 | MAR 12 |

(!!!) See Reference Notes on Page 68

# METEOROLOGICAL DATA FOR 1984

BRIDGEPORT, CONNECTICUT

LATITUDE: 41°10' N LONGITUDE: 73°08' W ELEVATION: FT. (grd) 7 (msl) 17 TIME ZONE: EASTERN WBAN: 94702

| | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEP | OCT | NOV | DEC | YEAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TEMPERATURE °F:** | | | | | | | | | | | | | |
| Averages | | | | | | | | | | | | | |
| -Daily Maximum | 33.3 | 43.1 | 40.8 | 55.8 | 65.9 | 80.4 | 81.4 | 82.6 | 72.3 | 65.2 | 53.4 | 47.1 | 60.1 |
| -Daily Minimum | 19.8 | 29.9 | 27.4 | 40.0 | 49.6 | 61.6 | 64.7 | 67.0 | 54.2 | 50.2 | 36.6 | 33.3 | 44.5 |
| -Monthly | 26.6 | 36.5 | 34.1 | 47.9 | 57.8 | 71.0 | 73.1 | 74.8 | 63.3 | 57.7 | 45.0 | 40.2 | 52.3 |
| -Monthly Dewpt. | | | | | | | | | | | | | |
| Extremes | | | | | | | | | | | | | |
| -Highest | 46 | 57 | 51 | 70 | 78 | 93 | 93 | 90 | 81 | 72 | 66 | 61 | 93 |
| -Date | 26 | 24 | 26 | 30 | 26 | 11 | 14 | 15 | 25 | 20 | 5 | 30 | JUL 14 |
| -Lowest | -7 | 11 | 8 | 31 | 40 | 48 | 57 | 55 | 43 | 33 | 22 | 22 | -7 |
| -Date | 22 | 2 | 10 | 22 | 17 | 1 | 26 | 21 | 28 | 6 | 20 | 8 | JAN 22 |
| **DEGREE DAYS BASE 65 °F:** | | | | | | | | | | | | | |
| Heating | 1188 | 819 | 952 | 508 | 227 | 18 | 0 | 0 | 104 | 219 | 593 | 761 | 5389 |
| Cooling | 0 | 0 | 0 | 0 | 7 | 207 | 258 | 313 | 61 | 0 | 0 | 0 | 846 |
| **% OF POSSIBLE SUNSHINE** | | | | | | | | | | | | | |
| **AVG. SKY COVER (tenths)** | | | | | | | | | | | | | |
| Sunrise - Sunset | 6.7 | 6.9 | 6.5 | 6.5 | 7.0 | 5.9 | 6.4 | 5.6 | 5.0 | 6.9 | 5.6 | 7.1 | 6.3 |
| Midnight - Midnight | | | | | | | | | | | | | |
| **NUMBER OF DAYS:** | | | | | | | | | | | | | |
| Sunrise to Sunset | | | | | | | | | | | | | |
| -Clear | 6 | 7 | 7 | 9 | 4 | 6 | 9 | 9 | 10 | 6 | 11 | 5 | 89 |
| -Partly Cloudy | 10 | 5 | 10 | 6 | 11 | 13 | 7 | 10 | 11 | 4 | 3 | 8 | 98 |
| -Cloudy | 15 | 17 | 14 | 15 | 16 | 11 | 15 | 12 | 9 | 21 | 16 | 18 | 179 |
| Precipitation .01 inches or more | 13 | 12 | 12 | 7 | 14 | 10 | 11 | 8 | 7 | 8 | 10 | 13 | 125 |
| Snow, Ice pellets 1.0 inches or more | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 |
| Thunderstorms | 0 | 0 | 1 | 2 | 5 | 4 | 6 | 2 | 1 | 1 | 0 | 1 | 23 |
| Heavy Fog, visibility 1/4 mile or less | 3 | 8 | 0 | 5 | 4 | 3 | 2 | 0 | 0 | 3 | 2 | 1 | 31 |
| Temperature °F | | | | | | | | | | | | | |
| -Maximum | | | | | | | | | | | | | |
| 90° and above | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 2 | 0 | 0 | 0 | 0 | 9 |
| 32° and below | 14 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 22 |
| -Minimum | | | | | | | | | | | | | |
| 32° and below | 28 | 17 | 19 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 13 | 89 |
| 0° and below | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **AVG. STATION PRESS. (mb)** | | | | | | | | | | | | | |
| **RELATIVE HUMIDITY (%)** | | | | | | | | | | | | | |
| Hour 01 | 76 | 78 | 69 | 74 | 73 | 75 | 79 | 80 | 79 | 86 | 78 | 78 | 77 |
| Hour 07 (Local Time) | 65 | 67 | 54 | 60 | 59 | 56 | 63 | 62 | 54 | 70 | 58 | 66 | 61 |
| Hour 13 | 71 | 71 | 58 | 67 | 64 | 66 | 71 | 72 | 65 | 77 | 64 | 72 | 68 |
| Hour 19 | | | | | | | | | | | | | |
| **PRECIPITATION (inches):** | | | | | | | | | | | | | |
| Water Equivalent | | | | | | | | | | | | | |
| -Total | 1.52 | 4.72 | 3.49 | 4.37 | 8.14 | 3.53 | 6.54 | 1.23 | 2.24 | 2.79 | 1.63 | 2.56 | 42.96 |
| -Greatest (24 hrs) | 0.53 | 2.05 | 1.67 | 1.66 | 2.28 | 1.14 | 2.01 | 0.69 | 1.00 | 1.24 | 1.07 | 0.95 | 2.28 |
| -Date | 10-11 | 28 | 13-14 | 4- 5 | 30-31 | 24-25 | 7 | 1- 2 | 3- 4 | 28-29 | 11-12 | 5- 6 | MAY 30-31 |
| Snow, Ice pellets | | | | | | | | | | | | | |
| -Total | 11.5 | T | 8.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | T | 1.5 | 21.4 |
| -Greatest (24 hrs) | 4.6 | T | 4.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | T | 1.0 | 4.6 |
| -Date | 18-19 | 28 | 8- 9 | | | | | | | | 13 | 27 | JAN 18-19 |
| **WIND:** | | | | | | | | | | | | | |
| Resultant | | | | | | | | | | | | | |
| -Direction (!!!) | | | | | | | | | | | | | |
| -Speed (mph) | | | | | | | | | | | | | |
| Average Speed (mph) | | | | | | | | | | | | | |
| Fastest Obs. 1 Min. | | | | | | | | | | | | | |
| -Direction (!!!) | 30 | 07 | 07 | 06 | 27 | 27 | 08 | 34 | 22 | 23 | 24 | 07 | 07 |
| -Speed (mph) | 23 | 31 | 38 | 26 | 23 | 35 | 25 | 24 | 22 | 30 | 30 | 31 | 38 |
| -Date | 31 | 29 | 28 | 23 | 1 | 11 | 27 | 16 | 20 | 3 | 16 | 6 | MAR 28 |
| PEAK GUST | | | | | | | | | | | | | |
| -direction (!!!) | N | NE | NE | NW | W | W | W | N | | S | NW | | |
| -Speed (mph) | 35 | 41 | 52 | 39 | 38 | 48 | 37 | 35 | 39 | 36 | 46 | 41 | 52 |
| -Date | 11 | 28 | 29 | 21 | 1 | 11 | 16 | 16 | 3 | 1 | 14 | 6 | MAR 29 |

(!!!) See Reference Notes on Page 6B

## b. Survey Data

| STA | B.S. | H.I. | F.S. | Elev |
|---|---|---|---|---|
| B.M. | 7.885 | | | 21.879 |
| TP # 1 | | | .89 | |
| TP # 1 | .47 | | | |
| TP # 2 | | | 10.92 | |
| TP # 2 | .37 | | | |
| TP # 3 | | | 5.44 | |
| TP # 3 | [illegible] | | | |
| TP # 4 | | | 7.21 | |
| TP # 4 | 2.34 | | | |
| TP # 5 | | | 6.69 | |
| TP # 5 | 4.67 | | | |
| Brass [illegible] | | | 5.59 | 4.669 |
| | Return | Run | | |
| Brass Plug | 5.67 | | | |
| TP # 5 | | | 4.74 | |
| TP # 5 | 6.77 | | | |
| TP # 4 | | | 2.41 | |

DIETZGEN NO. 384-6

Sunny

August 5, 1982

J. Thom

D. Strack

Level Run

New Haven Harbor

| [illegible] | [illegible] | HI | F.S. | Elev |
|---|---|---|---|---|
| [illegible] | 7.205 | | | |
| [illegible] | | | 3.77 | |
| [illegible] | 5.27 | | | |
| [illegible] | | | .205 | |
| [illegible] | 10.93 | | | |
| [illegible] | | | .50 | |
| [illegible] | 1.26 | | | |
| [illegible] | | | 8.255 | 21.874 |
| | 56.635 | | 56.62 | |

B.M. is A Standard Disk

Town of [illegible]

Sta 65 BM10

At Intersection of Sidewalks

on Corner of Howard and Fifth St.

DIETZGEN NO. 384-5

| STD | [illegible] | pH | F.S. | [illegible] | [illegible] |
|---|---|---|---|---|---|
| STA-9 | [illegible] | | - | 4.669 | |
| N-1 | | | 6.12 | 4.079 | - 4.08 |
| S-1 | | | 5.95 | 4.249 | - 4.25 |

| | | | Horz Dist | | |
|---|---|---|---|---|---|
| Sta 13A | 77°53'12" | | 308.91 | | |
| Tz 13 | | | | | |
| CS 11 | | | | | |

80° Sunny
August 11, 1987

New Haven Harbor
Sdt Station 13A

J. Tirell
D. Stuck

DIETZGEN NO. 384-6

| | | |
|---|---|---|
| Sta | [illegible] | |
| ~~Π 14~~ | | |
| " | 332°14'16" | |
| " | 332°14'20" | |
| " | 332°14'18" | 332°14'18.2" |
| " | 332°14'19" | |
| " | 332°14'17" | 27°45'41.8" |
| " | 332°14'19" | |
| Sta 5 | ~~332°14'16"~~ | |
| Π 14 | | |
| BS 24 | | 27°45'40.2" |
| " | 27°45'41" | |
| " | 27°45'39" | |
| " | 27°45'38" | |
| " | 27°45'36" | 27°45'38.5" |
| " | 27°45'38" | |
| [illegible] | 27°45'39" | |
| Π 14 | | |
| BS 5 | | |

DIETZGEN NO. 384-6

82 [illegible]

August 11, 1982

T. Thu

D. Strack

New Haven

Establish Coordinates of Transponder

| Sta | [illegible] | | | | |
|---|---|---|---|---|---|
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | 291°56'01.3 | | | |
| | [illegible] | 68°03'58.7" | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | 291°55'57.2" | | | |
| | [illegible] | 68°04'02.8" | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | | 68°04'01" | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | 68°04'01.7" | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |
| | [illegible] | | | | |

| Sta | [illegible] | | | | |
|---|---|---|---|---|---|
| " | 327°13'49" | | | | |
| " | 327°13'49" | | | | |
| " | 327°13'50" | | | | |
| " | 327°13'48" ~~[illegible]~~ | | | | |
| " | 327°13'47" | | | | |
| Sta-5 | 327°13'48" | | | | |
| Π @ 16 BS Light ~~BS 5~~ | | | | | |
| " | 32°46'14" | | | | |
| " | 32°46'12" | | | | |
| " | 32°46'12" | | | | |
| " | 32°46'13" | | | | |
| " | 32°46'11" | | | | |
| Light House | 32°46'12" | | | | |
| Π @ 16 | | | | | |
| BS 5 | | | | | |

327° 13'48.5"

32°46'11.50"

32°46'11.9"

32°46'12.3"

Triangulation

| | | |
|---|---|---|
| ∡6 | R | 70°45'45" |
| ∡5 | D | 178°58'03" |
| ∡4 | R | 287°10'36" |
| ∡3 | D | 35°22'54" |
| ∡2 | R | 143°35'24" |
| ∡1 | D | 251°47'45" |
| | | |
| ∡6-6A | R | 70°45'54" |
| ∡5-6A | RD | 178°58'12" |
| ∡4-6A | RR | 287°10'24" |
| ∡3-6A | D | 35°22'45" |
| ∡2-6A | DR | 143°35'19" 70°45'44" |
| ∡1-6A | D | 251°47'54" |
| T@5 | | 1510'4544" |
| BS@9 | | Ave 251°47'37.3" |
| | | |
| ∡6-6A | R | 70°45'33" |
| ∡5-6A | R | 178°57'54" |
| ∡4-6A | R | 287°10'27" |
| ∡3-6A | D | 35°22'30" |
| ∡2-6A | D | 143°34'54" |
| ∡1-6A | D | 251°47'39" |
| T@5 | | |
| BS@9 | | |

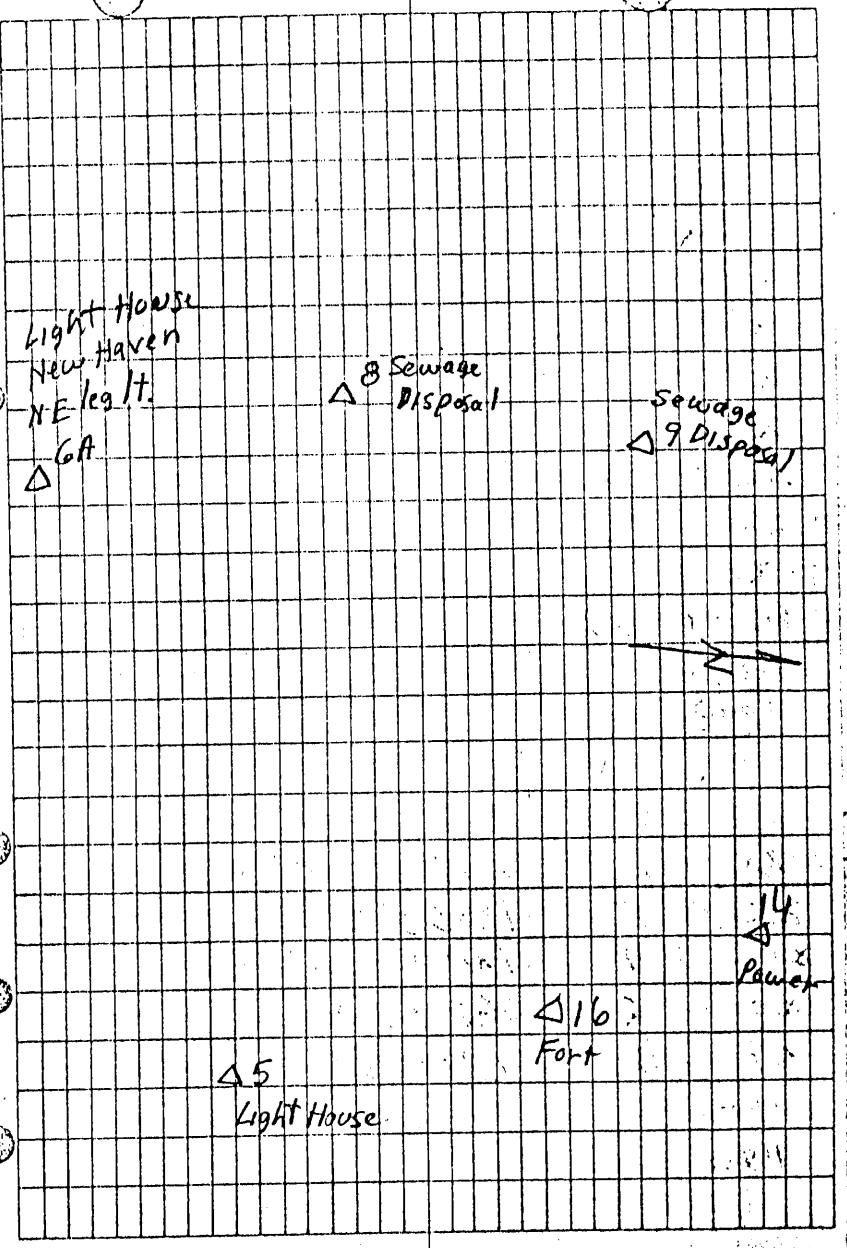
Triangulation to Establish
Point on West Breakwater
8-11-87
Sta @ Light House
Sta # 5

DIETZGEN NO. 384-3

2

| | | |
|---|---|---|
| 9 ∡6 | R | |
| 9 ∡5 | D | |
| 9 ∡4 | R | |
| 9 ∡3 | D | |
| 9 - ∡2 | R | |
| 9 Fs @ ∡1 | D | |
| T@S | | |
| B.S@8 | | |
| ∡6 | R | 200°50'27" |
| ∡5 | D | 287°22'00" |
| ∡4 | R | 13°53'32" |
| ∡3 | D | 100°25'20" |
| ∡2 | R | 186°57'00" |
| ∡1 | D | 273°28'36" |
| T@S | | |
| B.S@8 | | |

1




DIETZGEN NO. 384-3

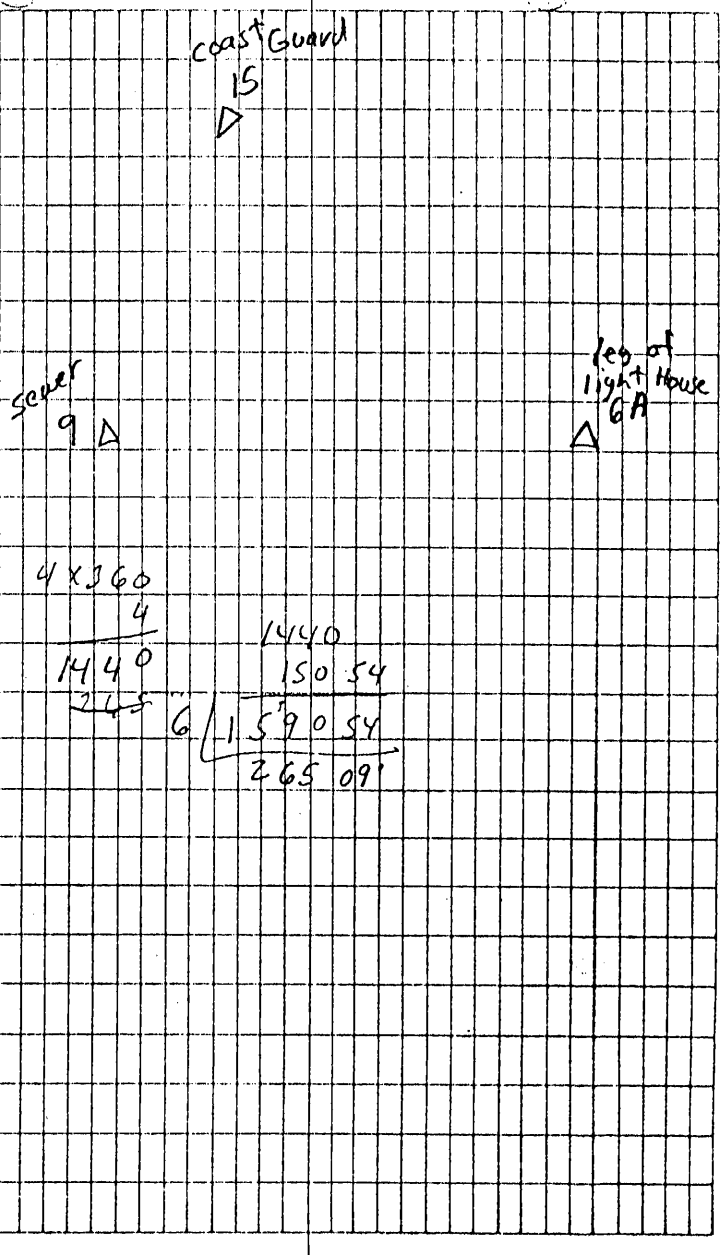
6

| | |
|---|---|
| ∡6 | 150°54'00" |
| ∡1 | 265°09'00" |
| ∡6 | 150°53'57" |
| ∡1 | 265°08'57" |
| ∡6 | 150°54'06" |
| ∡1 | 265°09'03" |

Π@15
BS@9

6

coast Guard
15



sewer
9

leg of
light House
6A

4 x 360
4
1440
265

1440
150 54
6 | 1590 54
265 09'

DIETZGEN NO. 384-3

4

| | | |
|---|---|---|
| ∡6 | | 297°59'48" |
| ∡5 | | 68°19'27' |
| ∡4 | | 198°40'03" |
| ∡3 | | 329°00'00" |
| ∡2 | | ~~99°00'19"~~ 99°19'59" |
| ∡1 | | 229°40'18" |
| | | |
| ∡6 | | 297°59'42" |
| ∡5 | | 68°19'24" |
| ∡4 | | 198°39'42" |
| ∡3 | | 328°59'40" |
| ∡2 | | 99°20'00" |
| ∡1 | | 229°40'09" |
| | | |
| ∡6 | R | 297°59'48" |
| ∡5 | D | 68°19'36" |
| ∡4 | R | 198°40'12" |
| ∡3 | D | 329°00'03" |
| ∡2 | R | 99°20'06" |
| ∡1 | D | 229°40'15" |
| T@5 | | |
| BS@16 | | |

4

1377°59'48"/6

297°59'48"

Ave 229°39'58"

DIETZGEN NO. 384-3

3

| | | |
|---|---|---|
| ∡6 | R | 308°01'18" |
| ∡5 | D | 76°41'09" |
| ∡4 | R | 205°20'57" |
| ∡3 | D | 334°00'39" |
| ∡2 | R | 102°40'30" |
| ∡1 | D | 231°20'24" |
| ∡6 | R | 308°00'51" |
| ∡5 | D | 76°40'27" |
| ∡4 | R | 205°20'30" |
| ∡3 | D | 334°00'12" |
| ∡2 | R | 102°40'12" |
| ∡1 | D | 231°20'12" |
| ∡6 | R | 308°00'36" |
| ∡5 | D | 76°40'18" |
| ∡4 | R | 205°20'24" |
| ∡3 | D | 334°00'06" |
| ∡2 | R | 102°40'06" |
| 6A-∡1 | D | 231°20'00" |

T@5

BS@14

3

| | | |
|---|---|---|
| ∡6 | 308°00'54" | 1388.0054" |
| ∡5 | 76°40'42" | |
| ∡4 | 205°20'36" | |
| ∡3 | 334°00'30" | |
| ∡2 | 102°40'20" | |
| ∡1 | 231°20'18" | |

DIETZGEN NO. 354-3

Computations of
Coordinates to check
against computer.

8-12-87 -
Strack

DIETZGEN NO. 364-3

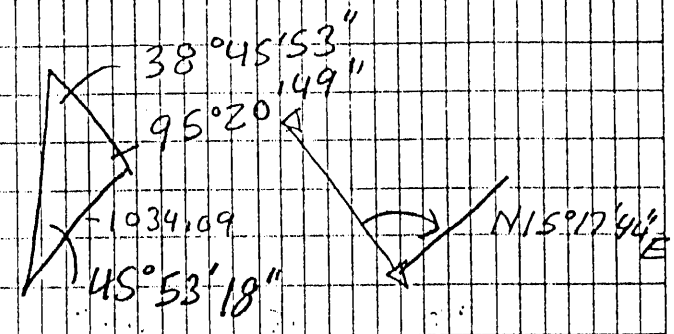
| | N | E |
|---|---|---|
| 11 | 168983.20 | 555811.74 |
| 13 ↓ | 167284.74 | 556592.03 |
| | − 1698.46 | + 780.29 |
| | 1869.12 | S 24°40'28" E |

39° 58 12 308.91

| | | |
|---|---|---|
| 13 | 167284.74 | 556592.03 |
| N 15°17'44" E 308.91 | + 297.97 | + 81.49 |
| 13A | 167582.71 | 556673.52 |

| | | |
|---|---|---|
| 11 | 168983.20 | 555811.74 |
| 13A ↓ | 167582.71 | 556673.52 |
| | 1400.49 | 861.78 |
| | 1644.40 | |
| | S 31°36'21" E | |

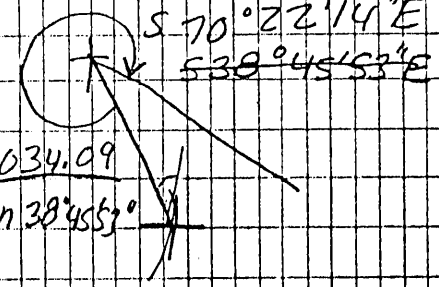
| | | |
|---|---|---|
| 13A. | 167582.71 | 556673.52 |
| N 14°16'57" E 1034.09 | 1002.13 | 255.11 |
| 1008 | 168584.84 | 556928.63 |




Jim

1004 341°04'11"

1008 321 14'07"



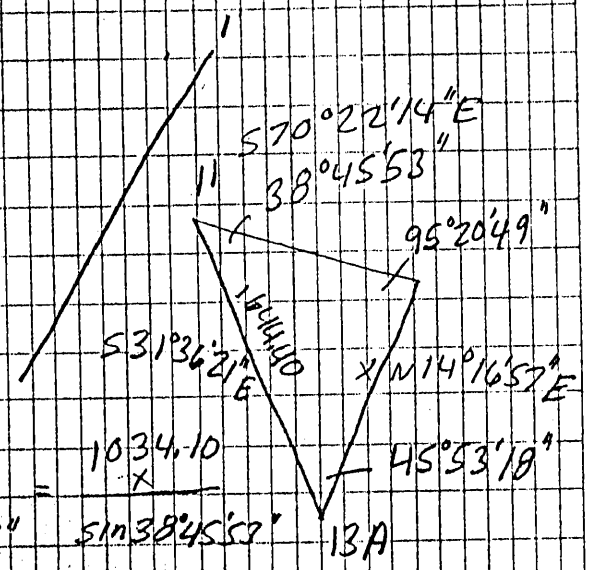

$$\frac{1644.40}{\sin 95°20'49"} = \frac{1034.09}{\sin 38°45'53"}$$

45°53'18"

N 14°16'57"E

DIETZGEN NO. 384-3

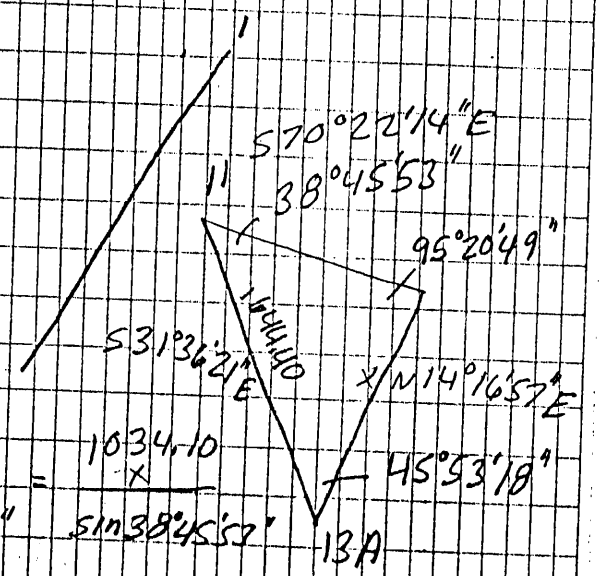
Jim 1008 321°14'07"
Dave 1008 45°53'18"




$$\frac{1644.40}{\sin 95°20'49''} = \frac{1034.10}{\sin 38°45'53''}$$

DIETZGEN NO. 384-3

Dim 1008 321°14'07"
Arc 1008 45°53'18"




$$\frac{1644.40}{\sin 95°20'49''} = \frac{1034.10}{\sin 38°45'53''}$$

DIETZGEN NO. 384-3

Seismic Sounding Shots

8-12-87
Strack

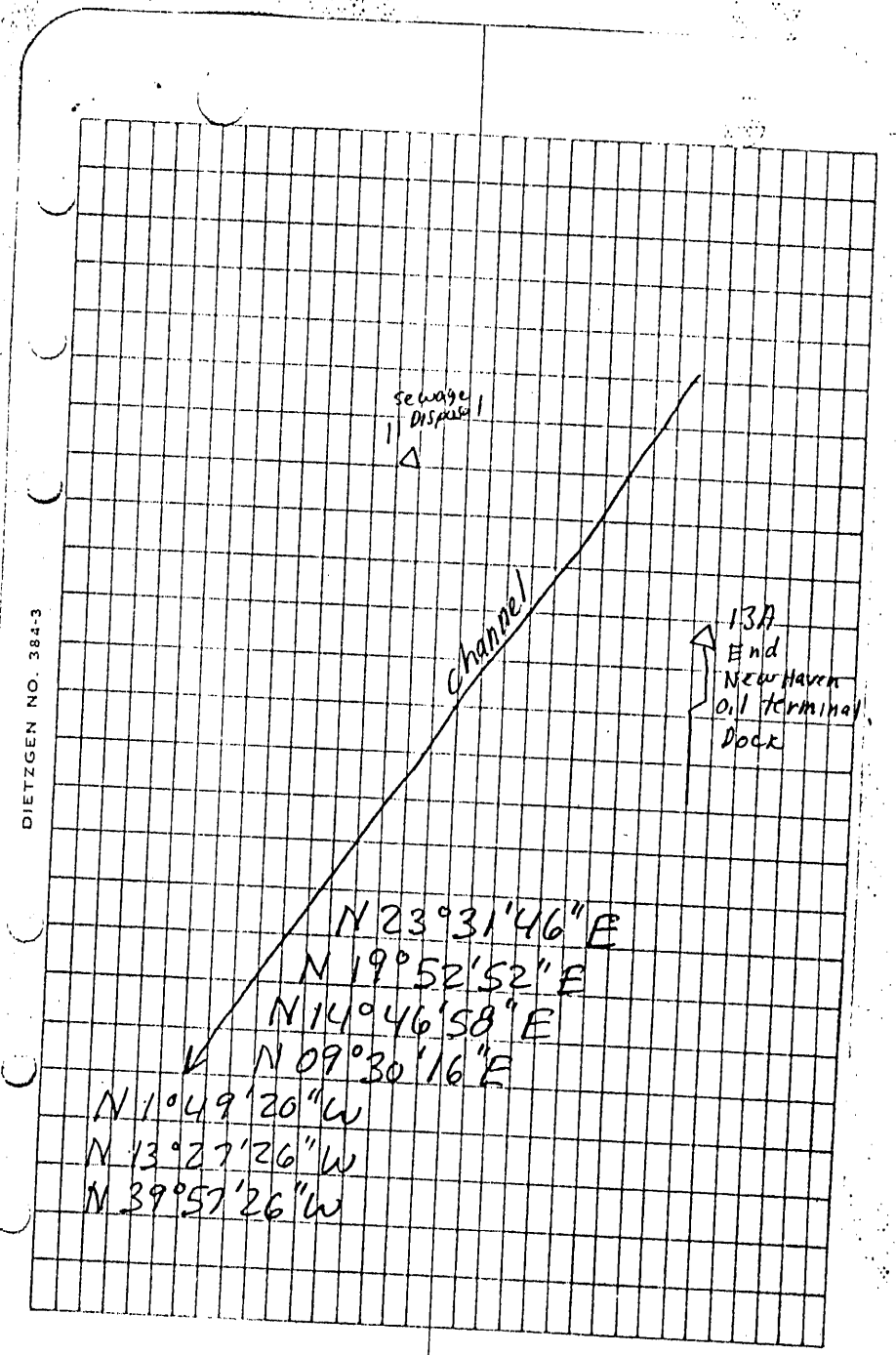
These ~~Soun~~ shots
were voided

DIETZGEN NO. 384-3

Shots were Voided

| End line 1000 | |
|---|---|
| 1012 | 54°38'06" |
| 1010 | 50°59'12" |
| 1008 | 45°53'18" |
| 1006 | 40°36'36" |
| 1004 | 29°17'00" |
| 1002 | 17°38'54" |
| 1000 | ~~352°12'06"~~ 351°08'54" |

TO @ 13A
BS @ 11




DIETZGEN NO. 384-3

CK CD0024

Check Shots 13, 13A to 11

~~Seismic Sounding Shot~~

~~2nd Run after~~

~~recalibration~~

8-12-87

Strack

| | | | | | |
|---|---|---|---|---|---|
| 11-13 | | | 1868.50 | | |
| 11-13A | | | 1643.82 | | |

DIETZGEN NO. 384-3

STA [illegible]

| | |
|---|---|
| 1012 | 307°05'26" |
| 1010 | 313°03'52" |
| 1008 | 321°14'07" ✓ |
| 1006 | 327°32'54" ✓ |
| 1004 | 341°04'11" ✓ |
| 1002 | 350°06'03" |
| 1000 | 4°20'01" |
| Π 11 | |
| BS 13A | |

August 12, 1987 — J. Thom

Sunny 80° — D. Strack

New Haven Harbor

Seismic Locations

DIETZGEN NO. 384-6

1ST RUN IS RUN 1000
IT IS BEING RUN FROM SOUTH TO NORTH

DIETZGEN NO. 3646

| | | |
|---|---|---|
| 8012 | 111°25'24" | N 1°24'25" E |
| 8010 | 106°40'24" | N 3°20'35" W |
| 8008 | 101°00'18" | N 9°00'41" W |
| 8006 | 95°24'45" | N 14°36'14" W |
| 8004 | 87°44'45" | N 22°16'14" W |
| 8002 | 79°16'12" | N 30°44'47" W |
| 8000 | 61°06'39" | N 48°54'20" W |
| Begin line 8000 | | |
| End line 1100 | | |
| 1112 | 127°38'30" | N 17°32'31" E |
| 1110 | 123°26'33" | N 13°25'34" E |
| 1008 | 119°50'06" | N 7°49'07" E |
| 1106 | 114°27'06" | N 4°26'07" E |
| 1104 | 105°26'03" | N 4°34'58" W |
| 1102 | 96°47'00" | N 13°13'59" W |
| ~~1000~~ 1100 | 85°44'24" | N 24°18'35" W |
| Begin Line ~~1000~~ 1100 | | |
| Π@13 | | |
| B@10 | | |

Seismic Soundings
8-13-87
2nd Run After
Recalibration

Strack

DIETZGEN NO. 384-3

2

| | | | |
|---|---|---|---|
| 9022 | S 42°24'21" W | 332°20'48" | |
| 9020 | S 47°00'43" W | 337°01'42" | |
| 9018 | S 53°27'49" W | 343°28'48" | |
| 9016 | S 60°00'31" W | 350°01'30" | |
| 9014 | S 69°31'31" W | 359°32'30" | |
| 9012 | S 79°26'55" W | 9°27'54" | |
| 9010 | N 88°00'43" W | 22°00'12" | |
| 9008 | N 75°34'47" W | 34°26'12" | Marked Early |
| 9006 | N 64°00'05" W | 46°00'54" | |
| 9004 | N 52°21'59" W | 57°39'00" | Marked Earlier |
| 9002 | N 44°55'23" W | 65°05'36" | |
| 9000 | N 35°21'11" W | 74°39'48" | |

Line 9000

End line 1500

| | | |
|---|---|---|
| 1514 | 122°32'24" | N 12°31'25" E |
| 1512 | 119°57'12" | N 9°56'13" E |
| 1510 | 117°18'00" | N 7°17'01" E |
| 1508 | 110°32'18" | N 0°31'19" E |
| 1506 | 104°38'12" | N 5°22'47" W |
| 1504 | 96°54'24" | N 13°06'11" W |
| 1502 | 87°27'09" | N 22°33'35" W |
| 1500 | 76°49'24" | N 33°11'35" W |

line 1500

Π@13

BS@10

1

342°45'44"

345°54'21"

Jim

347 13 26

350 42 25

DIETZGEN NO. 384-3

3

End line 9000

| | | |
|---|---|---|
| 9050 | S 20°02'13" W | 310°03'12" |
| 9048 | S 20°53'46" W | 310°54'45" |
| 9046 | S 21°36'01" W | 311°37'00" |
| 9044 | S 22°29'13" W | 312°30'12" |
| 9042 | S 23°05'13" W | 313°06'12" |
| 9040 | S 24°05'58" W | 314°06 57 |
| 9038 | S 24°58'37" W | 314°59'36" |
| 9036 | S 26°39'19" W | 316°40'18" |
| 9034 | S 27°51'07" W | 317°52'06" |
| 9032 | S 29°07'01" W | 319°08'00" |
| 9030 | S 30°58'07" W | 320°59'06" |
| 9028 | S 33°15'07" W | 323°16'06" |
| 9026 | S 36°03'34" W | 326°04'33" |
| 9024 | S 38°59'31" W | 329°00'30" |

Π@13

BS@10

2

DIETZGEN NO. 384-3

344°10'39"

Jim

344°46'10"

347°58'07"

| | | |
|---|---|---|
| 4 2046 | S12°23'18"W | 302° 24' 15" (100' side line) |
| 20[illegible]1 | S 13°02'10"W | 303°03'09" |
| 2042 | S14°52'01" | 304° 57'00" |
| 2040 | S 15°27'01"W | 305° 28' 00" |
| 2038 | S 15°20'43"W | 305° 21' 42" |
| 2036 | S 15°53'25"W | 305° 53' 24" |
| 2034 | S 16°51'40"W | 306° 52' 39" |
| 2032 | S 17°27'43"W | 307° 28' 42" |
| 2030 | S 17°42'43"W | 307° 47' 42" |
| 2028 | S 18°45'04"W | 308° 46' 03" |
| 2026 | S 20°36'04"W | 310° 37' 03" |
| 2024 | S 21°14'19"W | 311° 15' 18" |
| 2022 | S 24°01'19"W | 314° 02' 18" |
| 2020 | S 25°54'31"W | 315° 55' 30" |
| 2018 | S 29°05'43"W | 319° 06' 42" |
| 2016 | S 33°06'43"W | 323° 07' 42" |
| 2014 | S 40°20'58"W | 330° 21' 57" |
| 2012 | S 48°54'48"W | 338° 55' 45 |
| 2010 | S 68°20'07"W | 358° 21' 06" |
| 2008 | N 67°57'41"W | 22° 03' 18" |
| 2006 | N 68°52'26"W | 48° 08' 33" |
| 2004 | N 40°50'44"W | 69° 10' 15" |
| 2002 | N 29°22'53"W | 80° 38' 06" |
| 200[illegible] | N 20°06'59"W | 89° 52' 00" |

Begin 2000

TP@13

BS@10

56° 46' 23"

DIETZGEN NO. 3843

5

| | | |
|---|---|---|
| 2110 | S 14°39'13" W | 304° 40' 12" |
| 2108 | S 15°20'25" W | 305° 21' 24" |
| 2106 | S 16°43'01" W | 306° 44' 00" |
| 2104 | S 18°53'31" W | 308° 54' 30" |
| 2102 | S 22°08'25" W | 312° 09' 24" |
| 2100 | S 24°37'19" W | 314° 38' 18" Bad 2'± shot |
| Begin 2100 | | |
| End 9100 | | 3+ |
| 9106 | S 53°21'31" W | 343° 22' 30" |
| 9104 | S 58°04'31" W | 348° 05' 30" |
| 9102 | S 63°01'13" W | 353° 02' 12" |
| 9100 | S 68°58'01" W | 358° 59' 00" |
| Begin line 9100 | | ~~358° 59' 00"~~ |
| End line 9200 | | |
| 9212 | S 42°26'34" W | 332° 27' 33" |
| 9210 | S 46°57'49" W | 336° 58' 48" |
| 9208 | S 51°01'43" W | 341° 02' 42" |
| 9206 | S 56°37'31" W | 346° 38' 30" |
| 9204 | S 62°06'07" W | 352° 07' 06" |
| 9202 | S 70°02'55" W | 0° 03' 54" |
| 9200 | S 82°24'31" W | 12° 25' 30" |
| line 9200 | | |
| TT@13 | | |
| BS@10 | | |

50° 44' 09"

4 ~~5~~

349° 48' 53"

DIETZGEN NO. 384-3

| STA | [illegible] | | BEARING |
|---|---|---|---|
| 8012 | 342°45'44" | | N 52°44'45" E |
| 8010 | 343°05'25" | | N 53°04'26" E |
| 8008 | 343°21'35" | | N 53°20'36" E |
| 8006 | 343°57'10" | | N 53°56'11" E |
| 8004 | 344°33'41" | | N 54°32'42" E |
| 8002 | 344°30'40" | | N 54°29'41" E |
| 8000 | 345°54'21" | | N 55°53'22" E |
| Π ℓ 10 | | LINE 8000 | |
| BS 13 | | | |
| 1112 | 347°13'26" | | N 57°12'27" E |
| 1110 | 347°29'55" | | N 57°28'56" E |
| 1108 | 348°14'39" | | N 58°13'40" E |
| 1106 | 348°48'01" | | N 58°47'02" E |
| 1104 | 348°55'21" | | N 58°54'22" E |
| 1102 | 349°49'15" | | N 59°48'16" E |
| 1100 | 350°42'25" | | N 60°41'26" E |
| Π ℓ 10 | | LINE 1100 | |
| BS 13 | | | |

AUG 13, 1987

SUNNY/HAZY 80°

[illegible] TEW

D. STRACK

NEW HAVEN HARBOR

SEISMIC SURVEY

DIETZGEN NO. 384-6

| STA | Core 8 | | |
|---|---|---|---|
| 9018 | 5°51'23" | | N 75°50'24" E |
| 9016 | 3°04'56" | | N 73°03'57" E |
| 9014 | 08'31" | | N 71°22'11" E |
| 9012 | 357°44'39" | | N 67°43'40" E |
| 9010 | 354°56'25" | | N 64°55'26" E |
| 9008 | 352°47'20" | | N 62°46'21" E |
| 7006 | 350°21'22" | | N 60°20'23" E |
| 9004 | 348°37'36" | | N 58°36'37" E |
| 9002 | 346°16'52" | | N 56°15'53" E |
| 9000 | 344°10'39" | | N 54°09'40" E |
| Π @ 10 | | Line 9000 | |
| BS 13 | | | |
| 1514 | 344°46'10" | | N 54°45'11" E |
| 1512 | 345°14'40" | | N 55°13'41" E |
| 1510 | 345°26'18" | | N 55°25'19" E |
| 1508 | 346°01'39" | | N 56°00'40" E |
| 1506 | 346°34'28" | | N 56°33'29" E |
| 1504 | 347°09'23" | | N 57°08'24" E |
| 1502 | 347°42'19" | | N 57°41'20" E |
| 1500 | 347°58'07" | | N 57°57'08" E |
| Π @ 10 | | Line 1500 | |
| BS 13 | | | |

1st Line To Run Will Be Line 1100 South To North

2nd 8000 South To North

DIETZGEN NO. 384-6

| STA | 2023 | | |
|---|---|---|---|
| 2006 | 355°46'54" | | N65°45'55"E |
| 2004 | 353°52'28" | | N63°51'29"E |
| 2002 | 351°42'01" | | N61°41'02"E |
| 2000 | 349°48'53" | | N57°47'54"E |
| Π e 10 | | LINE 2000 | |
| BS 13 | | | |
| 9050 | 56°46'23" | | S53°14'36"E |
| 9048 | 54°18'38" | | S55°44'21"E |
| 9046 | 51°25'03" | | S58°35'56"E |
| 9044 | 48°29'27" | | S61°31'32"E |
| 9042 | 45°16'05" | | S64°44'54"E |
| 9040 | 42°08'36" | | S67°52'23"E |
| 9038 | 38°52'31" | | S71°08'28"E |
| 9036 | 35°40'50" | | S74°20'09"E |
| 9034 | 32°10'52" | | S77°50'07"E |
| 9032 | 28°49'40" | | S81°11'19"E |
| 9030 | 25°22'05" | | S84°38'54"E |
| 9028 | 22°08'37" | | S87°52'22"E |
| 9026 | 18°37'00" | | N88°36'01"E |
| 9024 | 15°21'53" | | N85°20'54"E |
| 9022 | 12°09'11" | | N82°08'12"E |
| 9020 | 9°04'21" | | N79°02'22"E |

3RD LINE RUN WILL BE LINE 1500 SOUTH TO NORTH
4TH 9000 NORTH TO SOUTH

DIETZGEN NO. 384-6

| STA | 'OIZZ 3 | | |
|---|---|---|---|
| 2046 | 50°44'09" | S 59°16'50"E | |
| 2044 | 47°40'36" | S 62°20'23"E | |
| 2042 | 45°28'03" | S 64°32'56"E | |
| 2040 | 42°35'23" | S 67°25'36"E | |
| 2038 | 39°48'06" | S 70°12'53"E | |
| 2036 | 36°47'27" | S 73°13'32"E | |
| 2034 | 33°54'09" | S 76°06'50"E | |
| 2032 | 30°55'42" | S 79°05'17"E | |
| 2030 | 27°53'33" | S 82°07'26"E | |
| 2028 | 25°00'50" | S 85°00'09"E | |
| 2026 | 21°56'25" | S 88°04'34"E | |
| 2024 | 19°05'48" | N 89°04'49"E | |
| 2022 | 16°07'41" | N 86°06'42"E | |
| 2020 | 13°18'39" | N 83°17'40"E | |
| 2018 | 10°35'06" | N 80°34'07"E | |
| 2016 | 7°54'33" | N 77°53'34"E | |
| 2014 | 5°17'21" | N 75°16'22"E | |
| 2012 | 2°52'12" | N 72°51'13"E | |
| 2010 | 12'24" | N 70°11'25"E | |
| 2008 | 358°04'03" | N 68°03'04"E | |

5TH LINE RUN WKC BE LINE 2000 NORTH TO SOUTH

DIETZGEN NO. 384-6

| Sta | Az | | |
|---|---|---|---|
| 2106 | 13°51'23" | | N83°50'24"E |
| 2104 | 11°11'52" | | N81°10'53"E |
| 2102 | 8°51'39" | | N78°50'40"E |
| 2100 | 6°55'24" | | N76°54'25"E |
| TC 10 | | Line 2100 | |
| BS 13 | | | |
| 9106 | 10°55'06" | | N80°54'07"E |
| 9104 | 7°15'03" | | N77°14'04"E |
| 9102 | 3°48'54" | | N73°47'55"E |
| 9100 | 31'03" | | N70°30'04"E |
| TC 10 | | Line 9100 | |
| BS 13 | | | |
| 9212 | 16°11'35" | | N86°10'36"E |
| 9210 | 12°33'12" | | N82°32'13"E |
| 9208 | 9°17'50" | | N79°16'51"E |
| 9206 | 5°57'09" | | N75°56'10"E |
| 9204 | 3°10'37" | | N73°09'38"E |
| 9202 | 359°58'45" | | N69°57'46"E |
| 9200 | 355°55'41" | | N65°54'42"E |
| TC 10 | | Line 9200 | |
| BS 13 | | | |

| Sta | [illegible] | | |
|---|---|---|---|
| 2110 | 19°24'45" | | N 89°23'44" E |
| 2108 | 16°45'27" | | N56°44'28" E |

6TH Line To Be Run with Br 9200 North To South
7TH 9100 NW To SO
8TH 2100

DIETZGEN NO. 384-6

| STA | Horz | Horz Dist |
|---|---|---|
| STA - 15A | 3°02'15" | |
| STA - 16 | 0°00' | 765.70 |
| STA - 15A | 3°02'14" | 790.23 |
| $\pi_2$ 15 | | |
| BS 16 | | |

Set Pt 15A

8-14-87

clear 80°

DIETZGEN NO. 384-6

August 14, 1987

P. Cloudy 75°

New Haven Harbor

Seismic Locations

J. Thon

D. Streck

DIETZGEN NO. 3846

| STA | [illegible] | | |
|---|---|---|---|
| 3520 | 341°36'27" | | N58°21'02"E |
| 3500 | 327°58'21" | | N44°42'56"E |
| Π @ 8 | | Line 3500 | |
| BS 15 | | | |
| 10036 | 354°34'19" | | N71°18'54"E |
| 10020 | 340°29'47" | | N57°14'22"E |
| 10000 | 326°56'30" | | N43°41'08"E |
| Π @ 8 | | Line 10000 | |
| BS 15 | | | |
| 3036 | 356°37'49" | | N73°22'24"E |
| 3020 | 342°34'00" | | N59°18'35"E |
| 3000 | 329°07'03" | | N45°51'38"E |
| Π @ 8 | | Line 3000 | |
| BS 15 | | | |
| 2540 | 328°29'34" | | N45°14'05"E |
| 2520 | 320°58'40" | | N37°43'15"E |
| 2510 | 317°59'03" | | N34°43'38"E |
| 2500 | 314°38'11" | | N31°22'46"E |
| Π @ 8 | | Line 2500 | |
| BS 15 | | | |

| STA | [illegible] | | |
|---|---|---|---|
| 4068 | 58°06'34" | | S45°08'51"E |
| 4060 | | | |
| 4040 | 35°30'47" | | S67°44'38"E |
| 4020 | 14°42'47" | | S88°32'38"E |
| 4000 | 354°54'22" | | N71°38'57"E |
| Π @ 8 | | Line 4000 | |
| BS 15 | | | |
| 3534 | 354°33'40" | | N71°18'15"E |

CKCD0024
seismic shots
8-14-87
strack @ sta 15

Partly Cloudy 65°

DIETZGEN NO. 384-3

1

| | | | |
|---|---|---|---|
| 4068 | 301° 39' 33" | S 18°24'06" W | |
| 4060 | 303° 23' 57" | S 20°08'32" W | |
| 4040 | 310° 17' 18" | S 27°01'53" W | |
| 4020 | 327° 11' 06" | S 43°55'41" W | |
| Begin line 4000 | 19° 20' 06" | N 83°55'19" W | |
| End line 3500 | | | |
| 3534 | N 85°57'01" W | 17° 18' 24" | |
| 3520 | N 49°17'10" W | 53° 58' 15" | |
| line 3500 | N 28°30'49" W | 74° 44' 36" | |
| 10036 | N 89°02'28" W | 14° 12' 57" | |
| 10,020 | N 53°07'28" W | 50° 07' 57" | |
| 10,000 | N 30°41'04" W | 72° 34' 21" | |
| line 10,000 | | | |
| 3036 | S 89°39'47" W | 12° 55' 12" | Jim missed |
| 3020 | N 44°34'30" W | 58° 31' 42" | |
| 3000 | N 25°13'43" W | 78° 01' 42" | |
| line 3000 | | | |
| End line 2500 | | | |
| 2540 | 74° 38' 24" | N 28°37'01" W | |
| 2520 | Missed | | |
| 2510 | 90° 20' 48" | N 12°54'37" W | |
| line 2500 | | | |
| T@15 | | | |
| BS@8 | | | |

1

354° 33' 40"

354 34 19
340° 29' 47"
326° 56' 30"

329° 07' 03" Jim

328° 29' 34" Jim

317° 59' 03" Jim

DIETZGEN NO. 384-3

| STA | [illegible] | | |
|---|---|---|---|
| 11124 | 55°20'28" | | S 42°22'37"E |
| 11100 | 6°42'30" | | N 88°59'25"E |
| Π 8 | | Line 11100 | |
| BS 15A | | | |
| 11066 | 49°01'07" | | S 48°41'58"E |
| 11000 | 347°33'57" | | N 69°50'52"E |
| Π 8 | | Line 11000 | |
| BS 15A | | | |
| 4562 | 52°00'45" | | S 45°42'20"E |
| 4500 | 348°57'38" | | N 71°14'33"E |
| Π 8 | | Line 4500 | |
| BS 15A | | | |

Aug [illegible] 1977

Sunny/Hazy 80°

New Haven Harbor

Seismic Locations

DIETZGEN NO. 384-6

Seismic Shots
Sta 15A
Fort Hale
8-15-87
Strack

DIETZGEN NO. 384-3

.6° 42' 30"

49° 01' 08
347 33 57

52° 00' 46"
348° 57' 38"

End 11100
11024 300° 54' 42" S 23° 11' 37" W
11100 344° 45' 06" S 67° 02' 01" W
Begin line 11100
End line 11000
11066 292° 02' 48" S 14° 19' 43" W
11000 34° 47' 39" N 62° 55' 26" W
Begin line 11000
~~11000~~ End line 4500
4562 299° 31' 51" S 21° 48' 46" W
4500 37° 20' 18" N 60° 22' 47" W
Begin line 4500
π @ 15A
BS @ 8

| | | | |
|---|---|---|---|
| Sta | 22 X | | |
| 12050 | 220°05'30" | | S 36°30'19" W |
| 12000 | 309°32'25" | | N 54°02'48" W |
| 5032 | 221°33'34" | | S 37°58'23" W |
| 5000 | 312°55'01" | | N 50°40'10" W |
| Πr 5 | | Line 5000 | |
| BS 15A | | | |

Au 16, 1987

75° Clear / Sunny

S. Tran

New Haven Harbor

Seismic Locations

DIETZGEN NO. 384-6

seismic shots
8-16-87
sta 15A + sta
track @ 15A

DIETZGEN NO. 384-3

| | | | N | E |
|---|---|---|---|---|
| 5000 | | | 153509.3 | 555042.4 |
| 5 | | | 151433.81 | 557560.51 |
| 15A | | | 159266.33 | 557062.58 |
| 5032 | | | 147125. | 554193 |
| 15A-5 | 7847.89 | 53°35'11" E | | |
| 12000 | | | 153572.7 | 554621.9 |
| 12050 | | | 146019.7 | 553552.4 |

220° 05' 30"
2.
309° 32' 25"

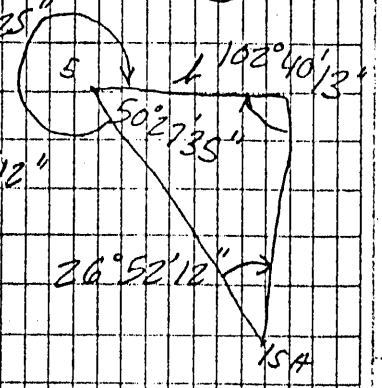
221° 33' 34"
312° 55' 01"

12050 18°28'00" S14°52'49"W
12000 26°52'12" S23°17'01"W
Begin line 12000
End line 5000 57"
5032 16°54'~~31~~" S13°19'46"W
5000 23°01'12" S19°26'01"W
Begin line 5000
T@15A
BS@

DIETZGEN NO. 384-3

7847.89 S 3°35'11

309°32'25"

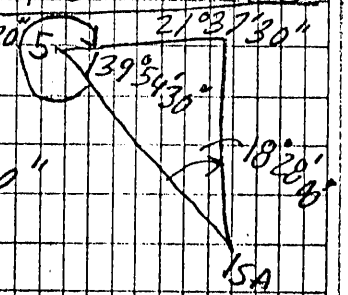



$$\frac{7847.89}{\sin 102°40'13"} = \frac{3635.52}{\sin 26°52'12"}$$

| | | |
|---|---|---|
| 5 | 151433.81 | 557560.51 |
| N54°02'46"W 3635.52 | + 2134.54 | − 2942.92 |
| 12,000 | 153568.35 | 554617.59 |
| | 153572.7 | 554621.9 |
| | + 4.3 | + 4.3 |

13,714.31'

220°05'30"

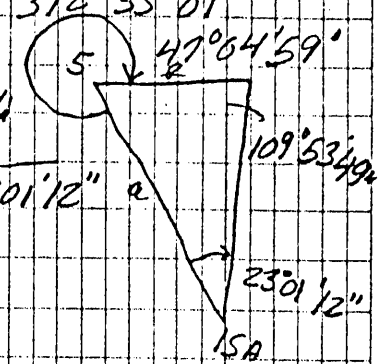



$$\frac{7847.89}{\sin 21°37'30"} = \frac{6745.29}{\sin 18°28'00"}$$

| | | |
|---|---|---|
| 5 | 151433.81 | 557560.51 |
| S 36°30'19"W 6745.29 | − 5421.88 | − 4012.75 |
| 12,050 | 146011.93 | 553547.76 |
| | 146019.7 | 553552.4 |
| | 7.8 | 4.6 |

7847.89 S 3°3[illegible]"E

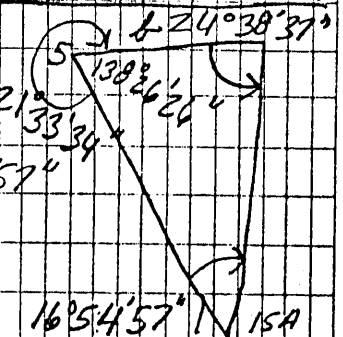
312°55'01"




$$\frac{7847.89}{\sin 109°53'49"} = \frac{3263.76}{\sin 23°01'12"}$$

| | | |
|---|---|---|
| 5 | 151433.81 | 557560.51 |
| N50°40'10"W 3263.76 | + 2068.55 | − 2524.53 |
| 5000 | 153502.36 | 555035.98 |
| | 153509.3 | 555042.4 |

b 24°38'37"




$$\frac{7847.89}{\sin 24°38'37"} = \frac{5476.31}{\sin 16°54'57"}$$

| | | |
|---|---|---|
| 5 | 151433.81 | 557560.51 |
| S37°58'23"W 5476.31 | − 4316.98 | − 3369.52 |
| 5032 | 147116.83 | 554190.99 |
| | 147125 | 554193 |

DIETZGEN NO. 384-3

Aug 1, 1987

Sunny/Hazy 85°

S. Thaw

New Haven Harbor

Seismic Location

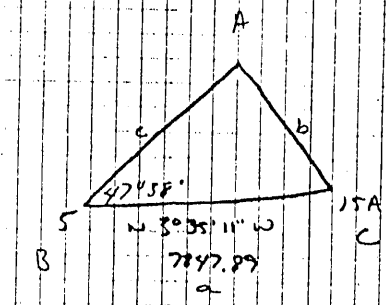
DIETZGEN NO. 384-6

| STA | RL 7 | | | | |
|---|---|---|---|---|---|
| 5500 | 312°22'00" | | | | |
| Π c 5 | | Line 5500 | | N51°13'11" W | |
| BS 15A | | | | | |

5500.

24' 16"
312° 22' 00"

DAVE
Jm




$$\frac{7847.89}{\sin 107°29'54"} = \frac{b}{\sin 47°38'} = \frac{c}{\sin 24°52'06"}$$

6079.73 3460.44

| | | | |
|---|---|---|---|
| 5 | | 151433.81 | 557560.51 |
| N 51°13'11" W | 3460.44 | 2167.40 | 2677.60 |
| 5500 | | 153601.2 | 554862.91 |
| | Weston | 153602.2 | 554871 |

DIETZGEN NO. 364-6

Seismic Shots

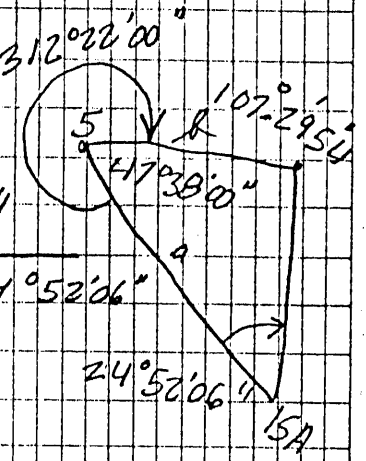
8-17-87
Sta @ 15A
Strack

Hazy, 80°

DIETZGEN NO. 384-3

15A S 3°35'11" E
7847.89'

| | N | E |
|---|---|---|
| N5 | | |
| 5 | 151,433.81 | 552560.51 |
| N51°13'11" W 3460.44 | 2167.40 | -2697.60 |
| 5500 | 153601.21 | 554862.91 |




$$\frac{7847.89}{\sin 107°29'54"} = \frac{3460.44}{\sin 24°52'06"}$$

| | N | E |
|---|---|---|
| 5500 | 153602.2 | 554871.0 |
| | 153601.2 | 554862.91 |

312°22'00"

5500 24°52'06" S 71°16'55" W
Begin line 5500
Π@15A
BS@5

DIETZGEN NO. 384-3

| STA | 27 3 | | | | |
|---|---|---|---|---|---|
| 111 -33 | 340°30'09" | | | | |
| 111-1 | 5°30'29" | LINE 111 | | | |
| 110 - 33 | 340°16'15" | | | | |
| 110 -1 | 5°24'10" | LINE 110 | | | |
| 109-33 | 337°25'00" | | BAD COMMUNICATIONS | | |
| 109 -1 | 5°04'17" | LINE 109 | | | |
| 107-11 | 1°10'21" | | | | |
| 1 | 7°36'57" | | | | |
| $\pi_c$ 1 BS TRANSPONDER | | LINE 107 | | | |

DIETZGEN NO. 384-6

AUGUST 21, 1987

SUNNY 75°

J. TAN

NEW HAVEN HARBOR

SEISMIC LOCATIONS

August [illegible], 1957

80° Sunny

[illegible]

S. Strack

D. Carlson

New Haven Harbor

Tide Recordings

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:40 | +2.6 | S-1 | 1.75 |
| 12:30 | Level | S-1 | 1.49 |
| 12:20 | -.19 | S-1 | 1.3 |
| 12:10 | -.39 | S-1 | 1.10 |
| 12:00 P.M. | -.60 | S-1 | .89 |
| 11:50 | -.79 | S-1 | .70 |
| 11:40 | -1.00 | S-1 | .49 |
| 11:30 | -1.34 | S-1 | .15 |
| 11:20 | -1.55 | S-1 | -.06 |
| 11:10 | -1.83 | S-1 | -.34 |
| 11:00 | -2.13 | S-1 | -.64 |
| 10:50 | -2.37 | S-1 | -.88 |
| 10:40 | -2.60 | S-1 | -1.11 |
| 10:30 | -2.85 | S-1 | -1.36 |
| 10:20 | -3.10 | S-1 | -1.61 |
| 10:10 | -3.46 | S-1 | -1.97 |
| 10:00 | -3.76 | S-1 | -2.27 |
| 9:50 | -4.05 | S-1 | -2.56 |
| 9:40 | -4.36 | S-1 | -2.87 |
| 9:30 | -4.65 | S-1 | -3.16 |
| 9:20 | -4.96 | S-1 | -3.47 |
| 9:10 | -5.24 | S-1 | -3.75 |
| 7:00 A.M. DST | -5.55 | S-1 | -4.06 |

DIETZGEN NO. 3846

| Time | ± | Location | Elev |
|---|---|---|---|
| 7:00 | -6.8 | S-1 | -5.31 |
| 6:50 | -6.60 | S-1 | -5.11 |
| 6:40 | -6.44 | S-1 | -4.95 |
| 6:30 | -6.30 | S-1 | -4.81 |
| 6:20 | -6.05 | S-1 | -4.56 |
| 6:10 | -5.85 | S-1 | -4.36 |
| 6:00 | -5.61 | S-1 | -4.12 |
| 5:50 | -5.32 | S-1 | -3.83 |
| 5:40 | -5.10 | S-1 | -3.61 |
| 5:30 | -4.86 | S-1 | -3.37 |
| 5:20 | -4.59 | S-1 | -3.10 |
| 5:10 | -4.37 | S-1 | -2.88 |
| 5:00 | -4.04 | S-1 | -2.55 |

| Time | ± | Location | Elev. |
|---|---|---|---|
| 4:50 | -3.78 | S-1 | -2.29 |
| 4:40 | -3.48 | S-1 | -1.99 |
| 4:30 | -3.25 | S-1 | -1.76 |
| 4:20 | -2.94 | S-1 | -1.45 |
| 4:10 | -2.65 | S-1 | -1.16 |
| 4:00 | -2.36 | S-1 | -.87 |
| 3:50 | -2.08 | S-1 | -.59 |
| 3:40 | -1.74 | S-1 | -.25 |
| 3:30 | -1.51 | S-1 | -.02 |
| 3:20 | -1.17 | S-1 | .32 |
| 3:10 | -.94 | S-1 | .55 |
| 3:00 | -.68 | S-1 | .81 |
| 2:50 | -.35 | S-1 | 1.14 |
| 2:40 | -.16 | S-1 | 1.33 |
| 2:30 | +.15 | S-1 | 1.64 |
| 2:20 | +.35 | S-1 | 1.84 |
| 2:10 | +.50 | S-1 | 1.99 |
| 2:00 | +.60 | S-1 | 2.09 |
| 1:50 | +.70 | S-1 | 2.19 |
| 1:40 | +.70 | S-1 | 2.19 |
| 1:30 | +.80 | S-1 | 2.29 |
| 1:20 | +.70 | S-1 | 2.19 |
| 1:10 | +.60 | S-1 | 2.09 |
| 1:00 | +.55 | S-1 | 2.04 |
| 12:50 | +.40 | S-1 | 1.89 |

Aug. 12 1957
80° Clear, Breezy

J. Thew
D. Stack
D. Carlson

New Haven Harbor
Tidal Readings

| Time | ± | Location | Elevation | La |
|---|---|---|---|---|
| 1:00 | -.28 | S-1 | 1.21 | |
| 12:50 | -.49 | S-1 | 1.00 | |
| 12:40 | -.75 | S-1 | .74 | |
| 12:30 | -1.08 | S-1 | .41 | |
| 12:20 | -1.22 | S-1 | .27 | |
| 12:10 | -1.44 | S-1 | .05 | |
| 12:00 | -1.70 | S-1 | -.21 | |
| 11:50 | -1.91 | S-1 | -.42 | |
| 11:40 | -2.15 | S-1 | -.66 | |
| 11:30 | -2.40 | S-1 | -.91 | |
| 11:20 | -2.62 | S-1 | -1.13 | |
| 11:10 | -2.92 | S-1 | -1.43 | |
| 11:00 | -3.17 | S-1 | -1.68 | |
| 10:50 | -3.49 | S-1 | -2.00 | |
| 10:40 | -3.78 | S-1 | -2.29 | |
| 10:30 | -4.15 | S-1 | -2.66 | |
| 10:20 | -4.45 | S-1 | -2.96 | |
| 10:10 | -4.72 | S-1 | -3.23 | |
| 10:00 | -4.97 | S-1 | -3.48 | |
| 9:50 | -5.28 | S-1 | -3.79 | |
| 9:40 | -5.59 | S-1 | -4.10 | |
| 9:30 | -5.92 | S-1 | -4.43 | |
| 9:20 | -6.18 | S-1 | -4.69 | |
| 9:10 | -6.46 | S-1 | -4.97 | |
| 9:00 AM DST | -6.70 | S-1 | -5.21 | |

DIETZGEN NO 3846

| Time | | ± | Location | Elevation | |
|---|---|---|---|---|---|
| 5:00 | | | | | |
| 4:50 | | | | | |
| 4:40 | | | | | |
| 4:30 | | | | | |
| 4:20 | | | | | |
| 4:10 | | -1.6 | S-1 | -.11 | |
| 4:00 | | -.75 | S-1 | .74 | |
| 3:50 | | -.48 | S-1 | 1.01 | |
| 3:40 | | -.24 | S-1 | 1.24 | |
| 3:30 | | +.05 | S-1 | 1.54 | |
| 3:20 | | +.26 | S-1 | 1.75 | |
| 3:10 | | +.48 | S-1 | 1.97 | |
| 3:00 | | +.60 | S-1 | 2.09 | |
| 2:50 | | +.75 | S-1 | 2.24 | |
| 2:40 | | +.80 | S-1 | 2.29 | |
| 2:30 | | +.94 | S-1 | 2.43 | |
| 2:20 | | +.90 | S-1 | 2.39 | |
| 2:10 | | +.90 | S-1 | 2.39 | |
| 2:00 | | +.85 | S-1 | 2.34 | |
| 1:50 | | +.70 | S-1 | 2.19 | |
| 1:40 | | +.55 | S-1 | 2.04 | |
| 1:30 | | +.35 | S-1 | 1.84 | |
| 1:20 | | +.18 | S-1 | 1.67 | |
| 1:10 | | -.10 | S-1 | 1.39 | |

| Time | | Location | Elevation |
|---|---|---|---|
| 12:40 | -1.91 | S-1 | -.42 |
| 12:30 | -2.14 | S-1 | -.65 |
| 12:20 | -2.42 | S-1 | -.93 |
| 12:10 | -2.64 | S-1 | -1.15 |
| 12:00 | -2.86 | S-1 | -1.37 |
| 11:50 | -3.18 | S-1 | -1.67 |
| 11:40 | -3.44 | S-1 | -1.95 |
| 11:30 | -3.74 | S-1 | -2.25 |
| 11:20 | -3.96 | S-1 | -2.47 |
| 11:10 | -4.24 | S-1 | -2.75 |
| 11:00 | -4.53 | S-1 | -3.04 |
| 10:50 | -4.78 | S-1 | -3.29 |
| 10:40 | -5.07 | S-1 | -3.58 |
| 10:30 | -5.32 | S-1 | -3.83 |
| 10:20 | -5.63 | S-1 | -4.14 |
| 10:10 | -5.86 | S-1 | -4.37 |
| 10:00 | -6.04 | S-1 | -4.55 |
| 9:50 | -6.24 | S-1 | -4.75 |
| 9:40 | -6.46 | S-1 | -4.97 |
| 9:30 | -6.58 | S-1 | -5.09 |
| 9:20 | -6.71 | S-1 | -5.22 |
| 9:10 | -6.76 | S-1 | -5.27 |
| 9:00 | -6.85 | S-1 | -5.36 |
| 8:50 | -6.82 | S-1 | -5.33 |
| 8:40 AM DST | -6.79 | S-1 | -5.30 |

Aug. 13 1987
Clear, Breezy

J. Thow
D. Stack
D. Carlson

New Haven Harbor
Tidal Readings

DIETZGEN NO. 384-6

| Time | | t | Location | Elevation | |
|---|---|---|---|---|---|
| 4:00 | | | | | |
| 3:50 | | +.28 | S-1 | 1.77 | |
| 3:40 | | +.44 | S-1 | 3.96 | |
| 3:30 | | +.54 | S-1 | 2.03 | |
| 3:20 | | +.65 | S-1 | 2.14 | |
| 3:10 | | +.80 | S-1 | 2.29 | |
| 3:00 | | +.70 | S-1 | 2.19 | |
| 2:50 | | +.60 | S-1 | 2.09 | |
| 2:40 | | +.45 | S-1 | 1.94 | |
| 2:30 | | +.30 | S-1 | 1.79 | |
| 2:20 | | +.10 | S-1 | 1.59 | |
| 2:10 | | -.09 | S-1 | 1.40 | |
| 2:00 | | -.25 | S-1 | 1.24 | |
| 1:50 | | -.50 | S-1 | .99 | |
| 1:40 | | -.79 | S-1 | .70 | |
| 1:30 | | -.71 | S-1 | .58 | |
| 1:20 | | -1.00 | S-1 | .49 | |
| 1:10 | | -1.22 | S-1 | .27 | |
| 1:00 | | -1.46 | S-1 | .03 | |
| 12:50 | | -1.76 | S-1 | -.27 | |

| Time | ± | Location | Elevation |
|---|---|---|---|
| 1:00 | -2.70 | S-1 | -1.21 |
| 12:50 | -2.91 | S-1 | -1.42 |
| 12:40 | -3.18 | S-1 | -1.69 |
| 12:30 | -3.42 | S-1 | -1.93 |
| 12:20 | -3.72 | S-1 | -2.23 |
| 12:10 | -4.04 | S-1 | -2.55 |
| 12:00 | -4.26 | S-1 | -2.77 |
| 11:50 | -4.50 | S-1 | -3.01 |
| 11:40 | -4.68 | S-1 | -3.19 |
| 11:30 | -4.91 | S-1 | -3.42 |
| 11:20 | -5.10 | S-1 | -3.61 |
| 11:10 | -5.40 | S-1 | -3.91 |
| 11:00 | -5.64 | S-1 | -4.15 |
| 10:50 | -5.88 | S-1 | -4.39 |
| 10:40 | -6.04 | S-1 | -4.55 |
| 10:30 | -6.20 | S-1 | -4.71 |
| 10:20 | -6.28 | S-1 | -4.79 |
| 10:10 | -6.39 | S-1 | -4.90 |
| 10:00 | -6.45 | S-1 | -4.96 |
| 9:50 | -6.56 | S-1 | -5.07 |
| 9:40 | -6.60 | S-1 | -5.11 |
| 9:30 | -6.57 | S-1 | -5.08 |
| 9:20 | -6.57 | S-1 | -5.08 |
| 9:10 | -6.42 | S-1 | -4.93 |
| 9:00 PM DST | -6.25 | S-1 | -4.76 |

Aug. 17, 1982
Clear, Breezy

J. Thew
D. Stack
D. Carlson

New Haven Harbor
Tidal Recordings

DIETZGEN NO. 384-6

| Time | | t | Location | Elevation | |
|---|---|---|---|---|---|
| 4:00 | | | | | |
| 3:50 | | +.30 | | 1.79 | |
| 3:40 | | +.26 | S-1 | 1.75 | |
| 3:30 | | +.18 | S-1 | 1.67 | |
| 3:20 | | +.08 | S-1 | 1.57 | |
| 3:10 | | -.05 | S-1 | 1.44 | |
| 3:00 | | -.26 | S-1 | 1.23 | |
| 2:50 | | -.42 | S-1 | 1.07 | |
| 2:40 | | -.63 | S-1 | .86 | |
| 2:30 | | -.81 | S-1 | .68 | |
| 2:20 | | -.97 | S-1 | .52 | |
| 2:10 | | -1.11 | S-1 | .38 | |
| 2:00 | | -1.26 | S-1 | .23 | |
| 1:50 | | -1.59 | S-1 | -.10 | |
| 1:40 | | -1.82 | S-1 | -.33 | |
| 1:30 | | -2.11 | S-1 | -.62 | |
| 1:20 | | -2.34 | S-1 | -.85 | |
| 1:10 | | -2.50 | S-1 | -1.01 | |

Aug. 15 1987
Hazy, Windy

J. Thew
D. Stack
D. Carlson

New Haven Harbor
Tidal Recordings

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:20 | -4.85 | S-1 | -3.36 |
| 12:10 | -5.06 | S-1 | -3.57 |
| 12:00 | -5.24 | S-1 | -3.75 |
| 11:50 | -5.39 | S-1 | -3.90 |
| 11:40 | -5.52 | S-1 | -4.03 |
| 11:30 | -5.76 | S-1 | -4.27 |
| 11:20 | -5.90 | S-1 | -4.41 |
| 11:10 | -5.98 | S-1 | -4.49 |
| 11:00 | -6.05 | S-1 | -4.56 |
| 10:50 | -6.10 | S-1 | -4.61 |
| 10:40 | -6.16 | S-1 | -4.67 ~~-4.48~~ |
| 10:30 | -6.30 | S-1 | -4.81 |
| 10:20 | -6.22 | S-1 | -4.73 |
| 10:10 | -6.15 | S-1 | -4.66 |
| 10:00 | -6.10 | S-1 | -4.61 |
| 9:50 | -5.98 | S-1 | -4.49 |
| 9:40 | -5.88 | S-1 | -4.39 |
| 9:30 | -5.80 | S-1 | -4.31 |
| 9:20 | -5.70 | S-1 | -4.21 ~~-6.23~~ |
| 9:10 | -5.51 | S-1 | -4.02 |
| 9:00 | -5.37 | S-1 | -3.88 |
| 8:50 | -5.23 | S-1 | -3.74 |
| 8:40 | -5.00 | S-1 | -3.51 |
| 8:30 | -4.85 | S-1 | -3.36 |
| 8:20 AM DST | -4.64 | S-1 | -3.15 |

DIETZGEN NO. 384-6

| Time | | Location | Elevation | |
|---|---|---|---|---|
| 3:00 | | | | |
| 2:50 | | | | |
| 2:40 | | | | |
| 2:30 | -1.88 | S-1 | -.39 | |
| 2:20 | -2.10 | S-1 | -.61 | |
| 2:10 | -2.32 | S-1 | -.83 | |
| 2:00 | -2.54 | S-1 | -1.05 | |
| 1:50 | -2.81 | S-1 | -1.32 | |
| 1:40 | -2.96 | S-1 | -1.47 | |
| 1:30 | -3.23 | S-1 | -1.74 | |
| 1:20 | -3.42 | S-1 | -1.93 | |
| 1:10 | -3.65 | S-1 | -2.16 | |
| 1:00 | -3.99 | S-1 | -2.50 | |
| 12:50 | -4.17 | S-1 | -2.68 | |
| 12:40 | -4.35 | S-1 | -2.86 | |
| 12:30 | -4.64 | S-1 | -3.15 | |

Aug 16 1987
Clear, Windy

J. Hew
D. Stack
D. Cadren

New Haven Harbor
Tidal Recording

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:00 | | | |
| 11:50 | | | |
| 11:40 | -5.80 | S-1 | -4.31 |
| 11:30 | -5.82 | S-1 | -4.33 |
| 11:20 | -5.87 | S-1 | -4.38 |
| 11:10 | -5.80 | S-1 | -4.31 |
| 11:00 | -5.74 | S-1 | -4.25 |
| 10:50 | -5.70 | S-1 | -4.21 |
| 10:40 | -5.69 | S-1 | -4.20 |
| 10:30 | -5.50 | S-1 | -4.01 |
| 10:20 | -5.37 | S-1 | -3.88 |
| 10:10 | -5.30 | S-1 | -3.81 |
| 10:00 | -5.15 | S-1 | -3.66 |
| 9:50 | -5.04 | S-1 | -3.55 |
| 9:40 | -4.87 | S-1 | -3.38 |
| 9:30 | -4.70 | S-1 | -3.21 |
| 9:20 | -4.57 | S-1 | -3.08 |
| 9:10 | -4.42 | S-1 | -2.93 |
| 9:00 | -4.26 | S-1 | -2.77 |
| 8:50 | -4.08 | S-1 | -2.59 |
| 8:40 | -3.92 | S-1 | -2.43 |
| 8:30 | -3.72 | S-1 | -2.23 |
| 8:20 AM DST | -3.44 | S-1 | -1.95 |

DIETZGEN NO 384-5

| Time | ± | Location | Elevation |
|---|---|---|---|
| 1:00 | -5.48 | S-1 | -3.99 |
| 12:50 | -5.59 | S-1 | -4.10 |
| 12:40 | -5.60 | S-1 | -4.11 |
| 12:30 | -5.57 | S-1 | -4.07 |
| 12:20 | -5.55 | S-1 | -4.06 |
| 12:10 | -5.55 | S-1 | -4.06 |
| 12:00 | -5.53 | S-1 | -4.04 |
| 11:50 | -5.51 | S-1 | -4.02 |
| 11:40 | -5.37 | S-1 | -3.88 |
| 11:30 | -5.29 | S-1 | -3.80 |
| 11:20 | -5.21 | S-1 | -3.72 |
| 11:10 | -5.05 | S-1 | -3.56 |
| 11:00 | -4.92 | S-1 | -3.43 |
| 10:50 | -4.81 | S-1 | -3.32 |
| 10:40 | -4.72 | S-1 | -3.23 |
| 10:30 | -4.51 | S-1 | -3.02 |
| 10:20 | -4.42 | S-1 | -2.93 |
| 10:10 | -4.27 | S-1 | -2.78 |
| 10:00 | -4.14 | S-1 | -2.65 |
| 9:50 | -3.92 | S-1 | -2.43 |
| 9:40 | -3.72 | S-1 | -2.23 |
| 9:30 | -3.53 | S-1 | -2.04 |
| 9:20 | -3.34 | S-1 | -1.85 |
| 9:10 | -3.22 | S-1 | -1.73 |
| 9:00 AM DST | -3.05 | S-1 | -1.56 |

Aug. 17 1987
Clear, Breezy

J. Thew
O. Stack
D. Carlson

New Haven Harbor
Tidal Recordings

DIETZGEN NO. 3846

| Time | | t | Location | Elevation | |
|---|---|---|---|---|---|
| 5:00 | | | | | |
| 4:50 | | | | | |
| 4:40 | | | | | |
| 4:30 | | -2.01 | S-1 | -.52 | |
| 4:20 | | -2.13 | S-1 | -.64 | |
| 4:10 | | -2.22 | S-1 | -.73 | |
| 4:00 | | -2.44 | S-1 | -.95 | |
| 3:50 | | -2.66 | S-1 | -1.17 | |
| 3:40 | | -2.79 | S-1 | -1.30 | |
| 3:30 | | -2.92 | S-1 | -1.43 | |
| 3:20 | | -3.14 | S-1 | -1.65 | |
| 3:10 | | -3.33 | S-1 | 1.84 | |
| 3:00 | | -3.52 | S-1 | -2.03 | |
| 2:50 | | -3.75 | S-1 | -2.26 | |
| 2:40 | | -3.96 | S-1 | -2.47 | |
| 2:30 | | -4.12 | S-1 | -2.63 | |
| 2:20 | | -4.30 | S-1 | -2.81 | |
| 2:10 | | -4.56 | S-1 | -3.07 | |
| 2:00 | | -4.68 | S-1 | -3.19 | |
| 1:50 | | -4.86 | S-1 | -3.37 | |
| 1:40 | | -4.95 | S-1 | -3.46 ~~-2.05~~ | |
| 1:30 | | -5.08 | S-1 | -3.59 | |
| 1:20 | | -5.25 | S-1 | -3.76 | |
| 1:10 | | -5.38 | S-1 | -3.89 | |

Aug. 18 1987 — J. Thew
Clear, Breezy — D. Stack
D. Carlson

New Haven Harbor
Tidal Recordings

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:40 | -5.19 | S-1 | -2.31 |
| 12:30 | -5.10 | S-1 | -3.61 |
| 12:20 | -5.00 | S-1 | -3.51 |
| 12:10 | -4.88 | S-1 | -3.39 |
| 12:00 | -4.76 | S-1 | -3.27 |
| 11:50 | -4.64 | S-1 | -3.15 |
| 11:40 | -4.46 | S-1 | -2.97 |
| 11:30 | -4.32 | S-1 | -2.83 |
| 11:20 | -4.20 | S-1 | -2.71 |
| 11:10 | -4.06 | S-1 | -2.57 |
| 11:00 | -3.91 | S-1 | -2.42 |
| 10:50 | -3.70 | S-1 | -2.21 |
| 10:40 | -3.52 | S-1 | -2.03 |
| 10:30 | -3.36 | S-1 | -1.87 |
| 10:20 | -3.21 | S-1 | -1.72 |
| 10:10 | -3.07 | S-1 | -1.58 |
| 10:00 | 2.90 | S-1 | -1.41 |
| 9:50 | -2.73 | S-1 | -1.24 |
| 9:40 | -2.56 | S-1 | -1.07 |
| 9:30 | -2.38 | S-1 | -.89 |
| 9:20 | -2.24 | S-1 | -.75 |
| 9:10 | -2.08 | S-1 | -.59 |
| 9:00 | -1.98 | S-1 | -.49 |
| 8:50 | -1.80 | S-1 | -.31 |
| 8:40 | -1.65 | S-1 | -.16 |

DIETZGEN NO. 384-6

| Time | | ± | Location | Elevation | |
|---|---|---|---|---|---|
| 2:00 | | | | | |
| 1:50 | | | | | |
| 1:40 | | | | | |
| 1:30 | | -5.46 | S-1 | -3.97 | |
| 1:20 | | -5.41 | S-1 | -3.92 | |
| 1:10 | | -5.35 | S-1 | -3.86 | |
| 1:00 | | -5.28 | S-1 | -3.79 | |
| 12:50 | | -5.24 | S-1 | -3.75 | |

Aug. 19, 1987

J. Thew
D. Carlson

New Haven Harbor
Tidal Recordings

DIETZGEN NO. 3846

| Time | ± | Location | Elevation |
|---|---|---|---|
| 1:00 | -4.68 | S-1 | -3.19 |
| 12:50 | -4.60 | S-1 | -3.11 |
| 12:40 | -4.44 | S-1 | -2.95 |
| 12:30 | -4.36 | S-1 | -2.87 |
| 12:20 | -4.16 | S-1 | -4.53 |
| 12:10 | -4.04 | S-1 | -4.41 |
| 12:00 | -3.87 | S-1 | -4.24 |
| 11:50 | -3.64 | S-1 | -4.01 |
| 11:40 | -3.50 | S-1 | -3.87 |
| 11:30 | -3.35 | S-1 | -1.86 |
| 11:20 | -3.23 | S-1 | -1.74 |
| 11:10 | -3.08 | S-1 | -1.59 |
| 11:00 | -2.86 | S-1 | -1.37 |
| 10:50 | -2.68 | S-1 | -1.19 |
| 10:40 | -2.52 | S-1 | -.03 |
| 10:30 | -2.30 | S-1 | -.81 |
| 10:20 | -2.16 | S-1 | -.67 |
| 10:10 | -2.04 | S-1 | -.55 |
| 10:00 | -1.94 | S-1 | -.45 |
| 9:50 | -1.77 | S-1 | -.30 |
| 9:40 | -1.63 | S-1 | -.14 |
| 9:30 | -1.51 | S-1 | -.02 |
| 9:20 | -1.40 | S-1 | .09 |
| 9:10 | -1.32 | S-1 | .36 |
| 9:00 AM DST | -1.30 | S-1 | .19 |

| Time | | ± | Location | Elevation | |
|---|---|---|---|---|---|
| 4:00 | | - | S-1 | | |
| 3:50 | | -4.69 | S-1 | -3.2 | |
| 3:40 | | -4.90 | S-1 | -3.41 | |
| 3:30 | | -5.05 | S-1 | -3.56 | |
| 3:20 | | -5.17 | S-1 | -3.68 | |
| 3:10 | | -5.22 | S-1 | -3.73 | |
| 3:00 | | -5.24 | S-1 | -3.75 | |
| 2:50 | | -5.25 | S-1 | -3.76 | |
| 2:40 | | -5.27 | S-1 | -3.78 | |
| 2:30 | | -5.37 | S-1 | -3.88 | |
| 2:20 | | -5.41 | S-1 | -3.92 | |
| 2:10 | | -5.36 | S-1 | -3.87 | |
| 2:00 | | -5.30 | S-1 | -3.81 | |
| 1:50 | | -5.24 | S-1 | -3.75 | |
| 1:40 | | -5.19 | S-1 | -3.70 | |
| 1:30 | | -5.04 | S-1 | -3.55 | |
| 1:20 | | -5.00 | S-1 | -3.51 | |
| 1:10 | | -4.92 | S-1 | -3.43 | |

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:50 | -3.87 | S-1 | -2.38 |
| 12:40 | -3.66 | S-1 | -2.17 |
| 12:30 | -3.48 | S-1 | -1.99 |
| 12:20 | -3.26 | S-1 | -1.77 |
| 12:10 | -3.13 | S-1 | -1.64 |
| 12:00 | -2.98 | S-1 | -1.49 |
| 11:50 | -2.78 | S-1 | -1.29 |
| 11:40 | -2.65 | S-1 | -1.16 |
| 11:30 | -2.42 | S-1 | -.93 |
| 11:20 | -2.22 | S-1 | -.73 |
| 11:10 | -2.06 | S-1 | -.57 |
| 11:00 | -1.92 | S-1 | -.43 |
| 10:50 | -1.76 | S-1 | -.27 |
| 10:40 | -1.56 | S-1 | -.07 |
| 10:30 | -1.42 | S-1 | .07 |
| 10:20 | -1.38 | S-1 | .11 |
| 10:10 | -1.30 | S-1 | .19 |
| 10:00 | -1.16 | S-1 | .33 |
| 9:50 | -1.10 | S-1 | .39 |
| 9:40 | -1.03 | S-1 | .46 |
| 9:30 | -.99 | S-1 | .50 |
| 9:20 | -.99 | S-1 | .50 |
| 9:10 | -.96 | S-1 | .53 |
| 9:00 | -1.02 | S-1 | .47 |
| 8:50 | -1.16 | S-1 | .33 |

Aug. 20, 1987 J. Thom
Clear, calm D. Carlson

New Haven Harbor
Tidal Recording

DIETZGEN NO 384-6

| Time | ± | Location | Elevation |
|---|---|---|---|
| 5:00 | | | |
| 4:50 | | | |
| 4:40 | | | |
| 4:30 | | | |
| 4:20 | -5.40 | S-1 | -3.91 |
| 4:10 | -5.49 | S-1 | -4.00 |
| 4:00 | -5.53 | S-1 | -4.04 |
| 3:50 | -5.52 | S-1 | -4.03 |
| 3:40 | -5.52 | S-1 | -4.03 |
| 3:30 | -5.54 | S-1 | -4.05 |
| 3:20 | -5.55 | S-1 | -4.06 |
| 3:10 | -5.50 | S-1 | -4.01 |
| 3:00 | -5.48 | S-1 | -3.99 |
| 2:50 | -5.46 | S-1 | -3.97 |
| 2:40 | -5.42 | S-1 | -3.73 |
| 2:30 | -5.31 | S-1 | -3.82 |
| 2:20 | -5.17 | S-1 | -3.68 |
| 2:10 | -5.05 | S-1 | -3.56 |
| 2:00 | -4.89 | S-1 | -3.40 |
| 1:50 | -4.74 | S-1 | -3.25 |
| 1:40 | -4.64 | S-1 | -3.15 |
| 1:30 | -4.59 | S-1 | -3.10 |
| 1:20 | -4.39 | S-1 | -2.90 |
| 1:10 | -4.23 | S-1 | -2.74 |
| 1:00 | -4.09 | S-1 | -2.60 |

| Time | ± | Location | Elevation |
|---|---|---|---|
| 12:30 | -2.60 | S-1 | -1.11 |
| 12:20 | -2.48 | S-1 | -.99 |
| 12:10 | -2.30 | S-1 | -.81 |
| 12:00 | -2.06 | S-1 | -.57 |
| 11:50 | -1.87 | S-1 | -.38 |
| 11:40 | -1.72 | S-1 | -.23 |
| 11:30 | -1.60 | S-1 | -.11 |
| 11:20 | -1.48 | S-1 | .01 |
| 11:10 | -1.38 | S-1 | .11 |
| 11:00 | -1.27 | S-1 | .22 |
| 10:50 | -1.20 | S-1 | .29 |
| 10:40 | -1.14 | S-1 | .35 |
| 10:30 | -1.03 | S-1 | .46 |
| 10:20 | -.98 | S-1 | .51 |
| 10:10 | -1.00 | S-1 | .49 |
| 10:00 | -1.04 | S-1 | .45 |
| 9:50 | -1.12 | S-1 | .37 |
| 9:40 | -1.17 | S-1 | .32 |
| 9:30 | -1.26 | S-1 | .23 |
| 9:20 | -1.37 | S-1 | .12 |
| 9:10 | -1.52 | S-1 | -.03 |
| 9:00 | -1.69 | S-1 | -.20 |
| 8:50 | -1.90 | S-1 | -.41 |
| 8:40 | -1.98 | S-1 | -.49 |
| 8:30 | -2.16 | S-1 | -.67 |

Aug 21, 1987
Clear, calm

J. Shaw
D. Carlson

DIETZGEN NO. 384-6

| Time | | ± | Location | Elevation | |
|---|---|---|---|---|---|
| 2:00 | | | | | |
| 1:50 | | | | | |
| 1:40 | | -3.96 | S-1 | -2.47 | |
| 1:30 | | -3.80 | S-1 | -2.31 | |
| 1:20 | | -3.62 | S-1 | -2.13 | |
| 1:10 | | -3.42 | S-1 | -1.93 | |
| 1:00 | | -3.20 | S-1 | -1.71 | |
| 12:50 | | -2.98 | S-1 | -1.49 | |
| 12:40 | | -2.74 | S-1 | -1.25 | |

11-1-87
Elevations for Tides
Correction 2.4 to
Mean low water from
Sea Level Datum 1929

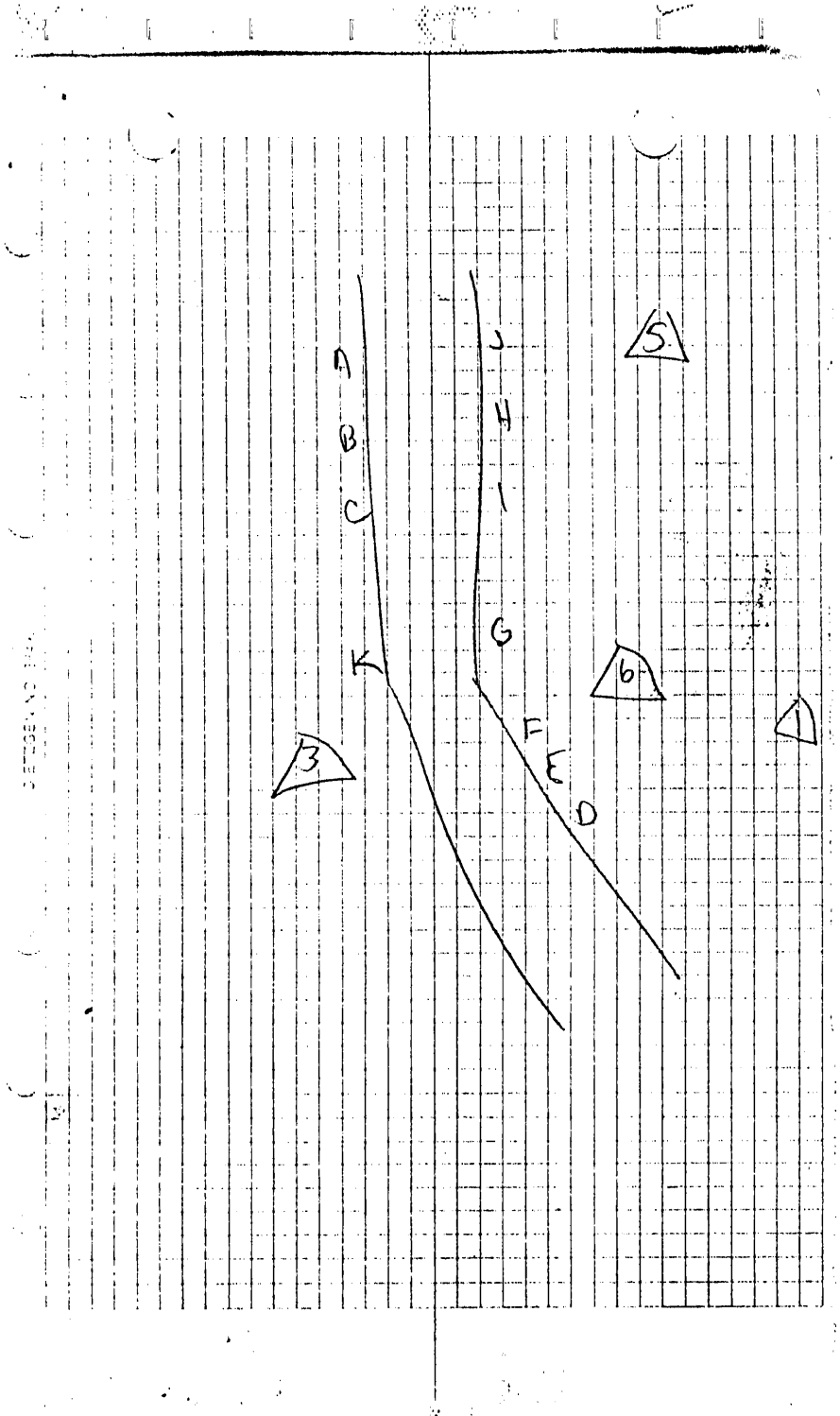
Sta. @ Jetty Headwall
@ Light House 7.85 MLW

Sta @ Marina Headwall
6.57 MLW

| Sta | Date | Time | Reading | MLW | MLW Elev |
|---|---|---|---|---|---|
| Lt House | | | | 7.85 | |
| A | 11-1-87 | 12:48PM | -7.85 | | 0.00 |
| A | | 1:22PM | -8.25 | | -0.40 |
| A | | 1:38PM | -8.25 | | -0.40 |
| A | | 2:02PM | -8.15 | | -0.30 |
| A | | 2:23PM | -7.85 | | 0.00 |
| A | | 2:48PM | -7.40 | | + 0.45 |
| A | | 4:19PM | -5.35 | | + ~~3.50~~ 2.50 |
| A | | 4:35PM | -4.95 | | + 2.90 |
| A | | 4:47PM | -4.65 | | + 3.20 |
| Marina Jetty | | | | 6.57 | |
| A | 11-1-87 | | -2.80 | | + 3.77 |
| Lt. House | | | | 7.85 | |
| G | 11-2-87 | 12:41PM | -6.95 | | +0.90 |
| G | | 1:35PM | -7.85 | | 0.00 |
| G | | 2:00PM | -8.15 | -0.30 | ~~7.0~~ 7.0 |
| G | | 2:31PM | -8.25 | | -0.40 |
| Marina | | | | 6.57 | |
| | ? | 4:00PM | -5.95 | | + 0.62 |
| @ Lt House | | | | 7.85 | |
| | | 4:36PM | -6.40 | | + 1.45 |
| | | 5:05PM | -5.60 | | + 2.25 |

| | | | | | |
|---|---|---|---|---|---|
| | Dbl ∡R | 351°13'21" | 355 36 40 | | |
| FS@G | ∡R | 355°36'33" | | | |
| T@5 | | ~~351°13'21"~~ | | | |
| BS@3 | | | | | |
| Steve | | | 347°07'00" | | |
| | Dbl ∡R | 21°28'48" | 10°44'24" | | |
| FS A | ∡R | 10°43'12" | | | |
| T@5 | | | | | |
| BS@3 | | | | | |

| Sta | Date | time | Reading | Elev Above MLW | MLW Elev. |
|---|---|---|---|---|---|
| Marina | | | | 6.57 | |


A
B
C
K
J
H
I
G
F
E
D
1
3
5
6

| | | | | | |
|---|---|---|---|---|---|
| Sta 2 | | | | | |
| | 172 05 20 | | | | |
| | 172 04 20 | 28 40 43 | | | |
| Sta 2 | 28 40 20 | | | | |
| | 143 23 40 | | | | |
| Set 1 Reps | 28 40 40 | | | | |
| Stat 2 | | | | | |
| Ñat 3 | 09 10 10 | 18 20 25 | 9 10 12 ~~9 10 22~~ | | |
| BS 5 | | | | | |
| Reset G | | | | | |
| 11/8/87 | | | | | |
| Reset #2 | | | | | |
| ~~FD-G~~ | 28 40 10 | | | | |
| FD-G | 19 15 30 | | | | |
| Ñat 3 | 9 ~~36 40~~ 37 40 | | 9 | 37 45 | |
| BS 5 | | | 2 \| 14 | 15 30 75 90 | |

# FD-A

N

144 957.374 3
151 433.810 5
6476.44

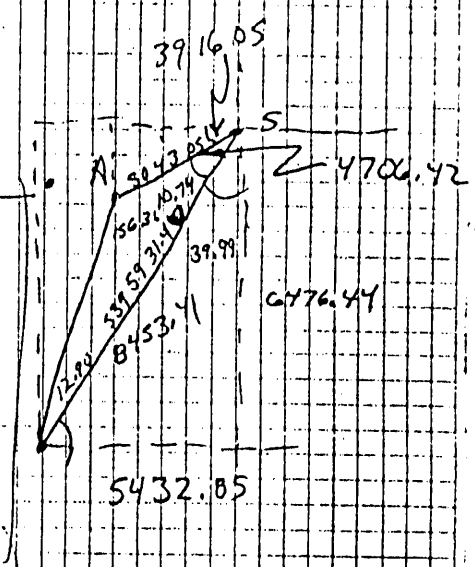
Actual

− 2978.92

148 454.88 N
24.80

553 916.83 E
(6.83)

25.80 off




tan $\frac{A-5}{\cancel{\sin 12.9}} = \frac{8453.41 (\sin 12.9)}{\sin 156.36}$

A − 5 = 4706.42

$\Delta N = \sin 39\,16\,05\,(4706.42) = 2978.92$

$\Delta E = \cos 39\,16\,05\,(4706.42) = 3643.68$

DIETZGEN NO. 384-5

| Fence | Date | Time | (−)Rod | Point EL. | YLW |
|---|---|---|---|---|---|
| G−FD | 11/8/87 | 9:55AM | 3.65 | 7.85 | 4.20 |
| | | 10:00 | 3.50 | | 4.35 |
| | | 10:15 | 3.20 | | 4.65 |

| | | | | |
|---|---|---|---|---|
| | 2592120 | | | |
| | 2231400 | 2231403 | | |
| | | | 136°45'58" interior | |
| | 2592410 | | | |
| | 2231410 | 2231402 | 22°27'00" | |
| | 2592440 | 2231407 | | |
| | 2231350 | | | |
| R3 | 3094220 | | | |
| R2 | 8628010 | | | |
| R1 | 2231410 | | | |
| 3 | 3094210 | | | |
| 2 | 8627050 | | | |
| 1 | 2231350 | | | |
| R3 | 3094210 | | | |
| R2 | 8628020 | | | |
| R1 | 2231400 | | | |
| 3 | 3094150 | | | |
| 2 | 8628000 | | | |
| Sta 3 1 | 2231410 | | | |
| Lighthouse at S | | | | |
| BS 16 Fort Hale | | | | |

| | BS | HI | FS | EL | |
|---|---|---|---|---|---|
| Sta 199 BM 4 | 5.88 | 10.27 | | 4.39 | |
| TP 1 | 8.22 | 17.53 | 0.96 | 9.31 | |
| TP 2 | 10.50 ~~10.51~~ | 27.35 | 0.68 | 16.85 | |
| TP 3 | 0.75 | 20.77 | 7.33 | 20.02 | |
| TP 4 | 14.34 | 33.82 | 1.29 | 19.48 | Corner ocean view |
| TP 5 | 8.20 ~~8.19~~ | 41.37 | 0.65 | 33.17 | |
| TP 6 | 6.63 | 32.64 | 15.46 ~~15.45~~ | 26.01 | |
| TP 7 Lighthouse Rd | 0.52 | 27.75 | 5.41 | 27.23 | |

| | | | | 1929 MSL | MLW |
|---|---|---|---|---|---|
| TP 2 PK Lot N side channel seawall | 4.19 | 12.98 | 7.53 | 8.79<br>5.45<br>2.4 | 7.85 |
| TP 3 Bait Shop top Block | 4.44 | 11.86 | 7.69 | 7.37<br>4.17<br>2.4<br>6.57 | 6.57 |
| | | | 90 05 40 | 269 59 45 | |
| | | | 90 05 40 | 269 59 50 | |
| | | | 90 05 45 | 269 59 45 | L |
| Tat end BS | IH = | 5.22 | | | |

| | S | HI | FS | EL |
|---|---|---|---|---|
| TP 8 | 7.61 | 26.71 | | 19.10 |
| TP 1 | | | 6.59 | 20.12 |
| TP 1 | 1.68 | 21.80 | | |
| TP 2 | | | 13.01 | 8.79 |
| TP 2 | 4.23 | 13.02 | | |
| TP 3 Boat Rental | | | 5.65 | 7.37 |
| TP 3 | 5.58 | 12.95 | | |
| TP 2 | | | 4.18 | 8. |
| TP 2 | 12.76 | | | |
| TP 1 | | | 1.43 | |
| TP 1 | 7.13 | | | |
| TP 8 | | | 8.15 | |
| Σ = | (38.99) | | (39.01) | |

| | S | HI | FS | EL | |
|---|---|---|---|---|---|
| | | 27.75 | | | |
| TP 8 | | | 8.65 | 19.10 | |
| curb in PK lot | 8.55 | | | | |
| TP 7 | | | 0.43 | | |
| | 4.86 | | | | |
| TP 6 | | | 6.08 | | |
| | 15.36 | | | | |
| TP 5 | | | 8.11 | | |
| | 0.76 | | | | |
| TP 4 | | | 14.45 | | |
| | 2.16 | | | | |
| TP 3 | | | 1.58 | | 1.85 |
| | 7.26 | | | | |
| TP 2 | | | 10.43 | | |
| | 0.84 | | | | |
| TP 1 | | | 8.38 | | |
| | 1.90 | | | | |
| BM | | | 6.85 | | |
| | 96.73 | | ~~96.85~~ | 96.74 | |

| | BS | HI | FS | EL | |
|---|---|---|---|---|---|
| Brass cap | 6.575 | | | | |
| top wall | ~~3.5~~ | | 3.555 | | |
| top sign | | | 0.665 | | |
| Const Guard Station | | | | | |
| BM | 3.32 | 18.38 | | 15.06 | MLW |
| Gauge | | | 2.49 | 16.09 | |

| | BS | HI | FS | EL |
|---|---|---|---|---|
| TP3 Boat Rental | 8.06 | 15.43 | | 7.37 |
| TP1 condos | | | 4.75 | 10.68 |
| TP1 | 4.84 | 15.52 | | |
| TP2 and condos | | | 9.96 | 5.56 |
| TP2 | 5.15 | 10.71 | | |
| TP3 | | | 1.60 | 9.11 |
| TP ~~4~~3 | 8.09 | 18.00 | | |
| TP4 | | | 6.49 | 11.51 |
| TP4 | 8.54 | 20.05 | | |
| Brass Plate tp | | | 10.29 | 9.76 |
| Wall | | | 7.26 | 12.79 |
| top sign | | | 4.39 | 15.66 |
| Brass Plate | 10.43 ~~10.30~~ | 20.19 | | ~~11.50~~ |
| ~~Ref. Plate~~ TP 4 | | | 8.69 | 11.50 |
| TP4 | 6.12 | 17.62 | | |
| TP3 | | | 8.50 | 9.12 |

| | | | | | |
|---|---|---|---|---|---|
| TP3 | 7.99 | 11.11 | | 9.12 | |
| TP2 | | | 5.53 | 5.58 | |
| TP2 | 9.89 | 15.47 | | | |
| TP1 | | | 4.78 | 10.69 | |
| TP1 | 4.72 | 15.41 | | | |
| TP3 Base Rock | | | 8.01 | 7.40 | |
| | 68.63 (204.35) | | 68.60 (204.35) | | |

| Sta | BS | HI | FS | Elev | |
|---|---|---|---|---|---|
| Morgan | 3.905 | 13.665 | | 9.76 | Morgan Brass Cap. mean Sea level 1929 Datum |
| E. Bk wtr | | | 3.84 | 9.825 | Paint mark |

Morgan

9.76
+HI 4.61
HI 14.37'
− HI 5.22
+ 1.78
Elev. @ Bk wtr. 10.93

Not Used

Steve vert∡ 90°05'40"
Ave. 90°02'58" 269°59'45"
HI 5.22

Ave 89°57'13" (89°57'39")
R 270°02'21"
S.D. 2195.38 D 89°56'48"
Ave. 89°57'11"
S.D. 2195.38 R 270°02'30"
D 89°56'52"

FS @ E. Bk wtr.
Π @ morgan HI = 4.61

10-30-87
CK CD 0024
Reciprical Trig. level
Stack @ Morgan Point
chatell @ East Bk. wtr.
10-29-87
Stack - 10-30-87
ck. Tell

DIETZGEN NO. 384-3

Vert ∡ 89°57'13" H = 2195.38
Dist 2195.38 V = +1.78'

~~Vert ∡ 89°57'30"~~
~~Dist~~
Vert ∡ 90°02'58" H = 2195.38
Dist. 2195.38 V = −1.89

DIETZGEN NO. 384-3

1

10-31

| | | | |
|---|---|---|---|
| ∡ 1-7-3 | 6x | 246°48'09" | 341°08'02" |
| | 1x | 341°08'00" | |
| | | used 341°08'3.5" | |
| ∡ 1-7-3 + | 6x | 246°48'30" | 341°08'05" |
| | 1x | 341°08'06" | |
| ∡ 1-7-3 | | 246°47'39" | 341°07'56" |
| | | 341°07'45" not used | |
| | | ~~341°08'06"~~ | |
| # 6 Rev | | 200°05'42" | 153°20'57" |
| # 1 Dir | | 153°20'54" | |
| ∡ 7-~~8~~1-3 | | | |
| | | 200°05'48" | 153°20'58" |
| # 6 Rev | | 153°20'54" | |
| # 1 Dir | | ~~153°21'06"~~ | |
| FS. Lud Bk wtr. | | | |
| ∡ 7-~~8~~+1-3 | | | |
| π @ morgan | | | |
| BS @ | | | |

10-31-87
Triangulation To
Establish Point on
Lud. Bk wtr.
Strack π Morgan
Chattell π

DIETZGEN NO. 384-3

2

10-31

| | | | |
|---|---|---|---|
| | R x 6 | 134° 42' 00" | 22° 27' 00" |
| 5-16-3 | D x 1 | 22° 27' 00" | |
| | R x 6 | 134° 41' 42" | |
| 5-16-3 | D x 1 | 22° 27' 00" | |
| | R x 6 | 134° 42' 06" | 22° 27' 01" |
| 5-16-3 | D x 1 | 22° 27' 06" | |

23° 11' 25"
23° 11' 20" = ∡ from tripod on Ludington BK wtr

| Steve | Dave |
|---|---|
| 3.77 | 3.905 |
| 3.90 | |

DIETZGEN NO. 384-3

## c. Tidal Elevations

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 12, 1987

AUGUST 12, 1987

| TIME | ELEVATION |
|---|---|
| 9:00AM | -5.21 |
| 9:10 | -4.97 |
| 9:20 | -4.69 |
| 9:30 | -4.43 |
| 9:40 | -4.10 |
| 9:50 | -3.79 |
| 10:00 | -3.48 |
| 10:10 | -3.23 |
| 10:20 | -2.96 |
| 10:30 | -2.66 |
| 10:40 | -2.29 |
| 10:50 | -2.00 |
| 11:00 | -1.68 |
| 11:10 | -1.43 |
| 11:20 | -1.13 |
| 11:30 | - .91 |
| 11:40 | - .66 |
| 11:50 | - .42 |
| 12:00PM | - .21 |
| 12:10 | .05 |
| 12:20 | .27 |
| 12:30 | .41 |
| 12:40 | .74 |
| 12:50 | 1.00 |
| 1:00 | 1.21 |
| 1:10 | 1.39 |
| 1:20 | 1.67 |
| 1:30 | 1.84 |
| 1:40 | 2.04 |
| 1:50 | 2.19 |
| 2:00 | 2.34 |
| 2:10 | 2.39 |
| 2:20 | 2.39 |
| 2:30 | 2.43 |
| 2:40 | 2.29 |
| 2:50 | 2.24 |
| 3:00 | 2.09 |
| 3:10 | 1.97 |
| 3:20 | 1.75 |
| 3:30 | 1.54 |
| 3:40 | 1.24 |
| 3:50 | 1.01 |
| 4:00 | .74 |
| 4:10 | - .11 |
| 4:20 | |
| 4:30 | |
| 4:40 | |
| 4:50 | |
| 5:00 | |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 13, 1987

| TIME | ELEVATION |
|---|---|
| 8:40AM | -5.30 |
| 8:50 | -5.33 |
| 9:00 | -5.36 |
| 9:10 | -5.27 |
| 9:20 | -5.22 |
| 9:30 | -5.09 |
| 9:40 | -4.97 |
| 9:50 | -4.75 |
| 10:00 | -4.55 |
| 10:10 | -4.37 |
| 10:20 | -4.14 |
| 10:30 | -3.83 |
| 10:40 | -3.58 |
| 10:50 | -3.29 |
| 11:00 | -3.04 |
| 11:10 | -2.75 |
| 11:20 | -2.47 |
| 11:30 | -2.25 |
| 11:40 | -1.95 |
| 11:50 | -1.69 |
| 12:00PM | -1.37 |
| 12:10 | -1.15 |
| 12:20 | - .93 |
| 12:30 | - .65 |
| 12:40 | - .42 |
| 12:50 | - .27 |
| 1:00 | .03 |
| 1:10 | .27 |
| 1:20 | .49 |
| 1:30 | .58 |
| 1:40 | .70 |
| 1:50 | .99 |
| 2:00 | 1.24 |
| 2:10 | 1.40 |
| 2:20 | 1.59 |
| 2:30 | 1.79 |
| 2:40 | 1.94 |
| 2:50 | 2.09 |
| 3:00 | 2.19 |
| 3:10 | 2.29 |
| 3:20 | 2.14 |
| 3:30 | 2.03 |
| 3:40 | 3.96 |
| 3:50 | 1.77 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 14, 1987

| TIME | ELEVATIONS |
|---|---|
| 9:00AM | -4.76 |
| 9:10 | -4.93 |
| 9:20 | -5.08 |
| 9:30 | -5.08 |
| 9:40 | -5.11 |
| 9:50 | -5.07 |
| 10:00 | -4.96 |
| 10:10 | -4.90 |
| 10:20 | -4.79 |
| 10:30 | -4.71 |
| 10:40 | -4.55 |
| 10:50 | -4.39 |
| 11:00 | -4.15 |
| 11:10 | -3.91 |
| 11:20 | -3.61 |
| 11:30 | -3.42 |
| 11:40 | -3.19 |
| 11:50 | -3.01 |
| 12:00PM | -2.77 |
| 12:10 | -2.55 |
| 12:20 | -2.23 |
| 12:30 | -1.93 |
| 12:40 | -1.69 |
| 12:50 | -1.42 |
| 1:00 | -1.21 |
| 1:10 | -1.01 |
| 1:20 | - .85 |
| 1:30 | - .62 |
| 1:40 | - .33 |
| 1:50 | - .10 |
| 2:00 | .23 |
| 2:10 | .38 |
| 2:20 | .52 |
| 2:30 | .68 |
| 2:40 | .86 |
| 2:50 | 1.07 |
| 3:00 | 1.23 |
| 3:10 | 1.44 |
| 3:20 | 1.57 |
| 3:30 | 1.67 |
| 3:40 | 1.75 |
| 3:50 | 1.79 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 15, 1987

| TIME | ELEVATION |
|---|---|
| 8:20AM | -3.15 |
| 8:30 | -3.36 |
| 8:40 | -3.51 |
| 8:50 | -3.74 |
| 9:00 | -3.88 |
| 9:10 | -4.02 |
| 9:20 | -4.21 |
| 9:30 | -4.31 |
| 9:40 | -4.39 |
| 9:50 | -4.49 |
| 10:00 | -4.61 |
| 10:10 | -4.66 |
| 10:20 | -4.73 |
| 10:30 | -4.81 |
| 10:40 | -4.67 |
| 10:50 | -4.61 |
| 11:00 | -4.56 |
| 11:10 | -4.49 |
| 11:20 | -4.41 |
| 11:30 | -4.27 |
| 11:40 | -4.03 |
| 11:50 | -3.90 |
| 12:00PM | -3.75 |
| 12:10 | -3.57 |
| 12:20 | -3.36 |
| 12:30 | -3.15 |
| 12:40 | -2.86 |
| 12:50 | -2.68 |
| 1:00 | -2.50 |
| 1:10 | -2.16 |
| 1:20 | -1.93 |
| 1:30 | -1.74 |
| 1:40 | -1.47 |
| 1:50 | -1.32 |
| 2:00 | -1.05 |
| 2:10 | - .83 |
| 2:20 | - .61 |
| 2:30 | - .39 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 16, 1987

| TIME | ELEVATION |
|---|---|
| 8:20AM | -1.95 |
| 8:30 | -2.23 |
| 8:40 | -2.43 |
| 8:50 | -2.59 |
| 9:00 | -2.77 |
| 9:10 | -2.93 |
| 9:20 | -3.08 |
| 9:30 | -3.21 |
| 9:40 | -3.38 |
| 9:50 | -3.55 |
| 10:00 | -3.66 |
| 10:10 | -3.81 |
| 10:20 | -3.88 |
| 10:30 | -4.01 |
| 10:40 | -4.20 |
| 10:50 | -4.21 |
| 11:00 | -4.25 |
| 11:10 | -4.31 |
| 11:20 | -4.38 |
| 11:30 | -4.33 |
| 11:40 | -4.31 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 17, 1987

| TIME | ELEVATION |
|---|---|
| 9:00AM | -1.56 |
| 9:10 | -1.73 |
| 9:20 | -1.85 |
| 9:30 | -2.04 |
| 9:40 | -2.23 |
| 9:50 | -2.43 |
| 10:00 | -2.65 |
| 10:10 | -2.78 |
| 10:20 | -2.93 |
| 10:30 | -3.02 |
| 10:40 | -3.23 |
| 10:50 | -3.32 |
| 11:00 | -3.43 |
| 11:10 | -3.56 |
| 11:20 | -3.72 |
| 11:30 | -3.80 |
| 11:40 | -3.88 |
| 11:50 | -4.02 |
| 12:00PM | -4.04 |
| 12:10 | -4.06 |
| 12:20 | -4.06 |
| 12:30 | -4.07 |
| 12:40 | -4.11 |
| 12:50 | -4.10 |
| 1:00 | -3.99 |
| 1:10 | -3.89 |
| 1:20 | -3.76 |
| 1:30 | -3.59 |
| 1:40 | -3.46 |
| 1:50 | -3.37 |
| 2:00 | -3.19 |
| 2:10 | -3.07 |
| 2:20 | -2.81 |
| 2:30 | -2.63 |
| 2:40 | -2.47 |
| 2:50 | -2.26 |
| 3:00 | -2.03 |
| 3:10 | 1.84 |
| 3:20 | -1.65 |
| 3:30 | -1.43 |
| 3:40 | -1.30 |
| 3:50 | -1.17 |
| 4:00 | - .95 |
| 4:10 | - .73 |
| 4:20 | - .64 |
| 4:30 | - .52 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 18, 1987

| TIME | ELEVATION |
|---|---|
| 8:40AM | - .16 |
| 8:50 | - .31 |
| 9:00 | - .49 |
| 9:10 | - .59 |
| 9:20 | - .75 |
| 9:30 | - .89 |
| 9:40 | -1.07 |
| 9:50 | -1.24 |
| 10:00 | -1.41 |
| 10:10 | -1.58 |
| 10:20 | -1.72 |
| 10:30 | -1.87 |
| 10:40 | -2.03 |
| 10:50 | -2.21 |
| 11:00 | -2.42 |
| 11:10 | -2.57 |
| 11:20 | -2.71 |
| 11:30 | -2.83 |
| 11:40 | -2.97 |
| 11:50 | -3.15 |
| 12:00PM | -3.27 |
| 12:10 | -3.39 |
| 12:20 | -3.51 |
| 12:30 | -3.61 |
| 12:40 | -7.31 |
| 12:50 | -3.75 |
| 1:00 | -3.79 |
| 1:10 | -3.86 |
| 1:20 | -3.92 |
| 1:30 | -3.97 |

# NEW HAVEN HARBOR

# TIDAL ELEVATIONS

# AUGUST 19, 1987

| TIME | ELEVATION |
|---|---|
| 9:00AM | .19 |
| 9:10 | .36 |
| 9:20 | .09 |
| 9:30 | - .02 |
| 9:40 | - .14 |
| 9:50 | - .30 |
| 10:00 | - .45 |
| 10:10 | - .55 |
| 10:20 | - .67 |
| 10:30 | - .81 |
| 10:40 | -1.03 |
| 10:50 | -1.19 |
| 11:00 | -1.37 |
| 11:10 | -1.59 |
| 11:20 | -1.74 |
| 11:30 | -1.86 |
| 11:40 | -3.87 |
| 11:50 | -4.01 |
| 12:00PM | -4.24 |
| 12:10 | -4.41 |
| 12:20 | -4.53 |
| 12:30 | -2.87 |
| 12:40 | -2.95 |
| 12:50 | -3.11 |
| 1:00 | -3.19 |
| 1:10 | -3.43 |
| 1:20 | -3.51 |
| 1:30 | -3.55 |
| 1:40 | -3.70 |
| 1:50 | -3.75 |
| 2:00 | -3.81 |
| 2:10 | -3.87 |
| 2:20 | -3.92 |
| 2:30 | -3.88 |
| 2:40 | -3.78 |
| 2:50 | -3.76 |
| 3:00 | -3.75 |
| 3:10 | -3.73 |
| 3:20 | -3.68 |
| 3:30 | -3.56 |
| 3:40 | -3.41 |
| 3:50 | -3.20 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 20, 1987

| TIME | ELEVATION |
|---|---|
| 8:50AM | .33 |
| 9:00 | .47 |
| 9:10 | .53 |
| 9:20 | .50 |
| 9:30 | .50 |
| 9:40 | .46 |
| 9:50 | .39 |
| 10:00 | .33 |
| 10:10 | .19 |
| 10:20 | .11 |
| 10:30 | .07 |
| 10:40 | - .07 |
| 10:50 | - .27 |
| 11:00 | - .43 |
| 11:10 | - .57 |
| 11:20 | - .73 |
| 11:30 | - .93 |
| 11:40 | -1.16 |
| 11:50 | -1.29 |
| 12:00PM | -1.49 |
| 12:10 | -1.64 |
| 12:20 | -1.77 |
| 12:30 | -1.99 |
| 12:40 | -2.17 |
| 12:50 | -2.38 |
| 1:00 | -2.60 |
| 1:10 | -2.74 |
| 1:20 | -2.90 |
| 1:30 | -3.10 |
| 1:40 | -3.15 |
| 1:50 | -3.25 |
| 2:00 | -3.40 |
| 2:10 | -3.56 |
| 2:20 | -3.68 |
| 2:30 | -3.82 |
| 2:40 | -3.93 |
| 2:50 | -3.97 |
| 3:00 | -3.99 |
| 3:10 | -4.01 |
| 3:20 | -4.06 |
| 3:30 | -4.05 |
| 3:40 | -4.03 |
| 3:50 | -4.03 |
| 4:00 | -4.04 |
| 4:10 | -4.00 |
| 4:20 | -3.91 |

NEW HAVEN HARBOR

TIDAL ELEVATIONS

AUGUST 21, 1987

| TIME | ELEVATION |
|---|---|
| 8:30AM | - .67 |
| 8:40 | - .49 |
| 8:50 | - .41 |
| 9:00 | - .20 |
| 9:10 | - .03 |
| 9:20 | .12 |
| 9:30 | .23 |
| 9:40 | .32 |
| 9:50 | .37 |
| 10:00 | .45 |
| 10:10 | .49 |
| 10:20 | .51 |
| 10:30 | .46 |
| 10:40 | .35 |
| 10:50 | .29 |
| 11:00 | .22 |
| 11:10 | .11 |
| 11:20 | .01 |
| 11:30 | - .11 |
| 11:40 | - .23 |
| 11:50 | - .38 |
| 12:00PM | - .57 |
| 12:10 | - .81 |
| 12:20 | - .99 |
| 12:30 | -1.11 |
| 12:40 | -1.25 |
| 12:50 | -1.49 |
| 1:00 | -1.71 |
| 1:10 | -1.93 |
| 1:20 | -2.13 |
| 1:30 | -2.31 |
| 1:40 | -2.47 |