MINUTE ITEM

C15

10/21/87
WP 1833
Lane

GENERAL PERMIT - RIGHT-OF-WAY USE

Calendar Item C15, attached, was pulled from the agenda prior to the meeting.

Attachment: Calendar Item C15.

CALENDAR ITEM

A 2
S 2

C 15

10/21/87
WP 1833
Lane

PRC 1833

GENERAL PERMIT - RIGHT-OF-WAY USE

APPLICANT: AT & T Communications
P.O. Box 121
Pleasanton, California 95466

AREA, TYPE LAND AND LOCATION:
A 4.42-acre parcel of tide and submerged land in the Pacific Ocean north of Manchester, Mendocino County.

LAND USE: Right-of-Way, ten feet wide, for a submarine lightguide cable.

TERMS OF PROPOSED PERMIT:
Special: Continuous use plus one year from November 1, 1987.

CONSIDERATION: Exempt by law, Section 7901, Public Utilities Code.

BASIS FOR CONSIDERATION:
Pursuant to 2 Cal. Adm. Code 2003, and Public Utilities Code 7901

APPLICANT STATUS:
Applicant is owner and permittee of upland.

PREREQUISITE CONDITIONS, FEES AND EXPENSES:
Filing fee and processing costs have been received.

STATUTORY AND OTHER REFERENCES:
A. P.R.C.: Div. 6, Parts 1 and 2; Div. 13.

B. Cal. Adm. Code: Title 2, Div. 3; Title 14, Div. 6,

C. Section 7901, Public Utilities Code.

AB 884: 01/23/87.

OTHER PERTINENT INFORMATION:

1. The project calls for trench placement of a fiber optic cable in the Pacific Ocean for approximately 40 miles; from that point to Hawaii, the cable will be on the ocean floor. This cable will replace and update existing cable covered by PRC 1833 which crosses the Pacific Ocean. When the new cable is in place and tested for reliability, AT&T plans to request abandonment of the old cable and termination of the lease for that site.

2. The annual rental value of the site is estimated to be $676.

3. Pursuant to the Commission's delegation of authority and the State CEQA Guidelines (14 Cal. Adm. Code 15025), the staff has prepared a Proposed Negative Declaration identified as EIR ND 424, State Clearinghouse No. 87081105. Such Proposed Negative Declaration was prepared and circulated for public review pursuant to the provisions of CEQA.

   Based upon the Initial Study, the Proposed Negative Declaration, and the comments received in response thereto, there is no substantial evidence that the project will have a significant effect on the environment. (14 Cal. Adm. Code 15074(b))

4. This activity involves lands which have NOT been identified as possessing significant environmental values pursuant to P.R.C. 6370, et seq. However, the Commission has declared that all tide and submerged lands are "significant" by nature of their public ownership (as opposed to "environmental significant"). Since such declaration of significance is not based upon the requirements and criteria of P.R.C. 6370, et seq., use classifications for such lands have not been designated.

Therefore, the finding of the project's consistency with the use classification as required by 2 Cal. Adm. Code 2954 is not applicable.

APPROVALS OBTAINED:
United States Army Corps of Engineers and County of Mendocino.

FURTHER APPROVALS REQUIRED:
California Coastal Commission and Department of Fish and Game.

EXHIBITS:
A. Land Description.
B. Location Map.
C. Negative Declaration.

IT IS RECOMMENDED THAT THE COMMISSION:

1. CERTIFY THAT A NEGATIVE DECLARATION, EIR ND 424, STATE CLEARINGHOUSE NO. 87081105, WAS PREPARED FOR THIS PROJECT PURSUANT TO THE PROVISIONS OF THE CEQA AND THAT THE COMMISSION HAS REVIEWED AND CONSIDERED THE INFORMATION CONTAINED THEREIN.

2. DETERMINE THAT THE PROJECT, AS APPROVED, WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT.

3. FIND THAT THE SIGNIFICANT ENVIRONMENTAL VALUES ORIGINALLY IDENTIFIED PURSUANT TO P.R.C. 6370, ET SEQ., ARE NOT WITHIN THE PROJECT SITE AND WILL NOT BE AFFECTED BY THE PROPOSED PROJECT.

4. AUTHORIZE ISSUANCE TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY OF A GENERAL PERMIT - RIGHT-OF-WAY USE, BEGINNING NOVEMBER 1, 1987; IN CONSIDERATION OF A PERIOD OF CONTINUOUS USE, PLUS ONE YEAR, WHICH IS EXEMPT FROM CONSIDERATION PURSUANT TO SECTION 7901, PUBLIC UTILITIES CODE; FOR THE CONSTRUCTION AND MAINTENANCE OF A SUBMARINE LIGHTGUIDE CABLE ON THE LAND DESCRIBED ON EXHIBIT "A" ATTACHED AND BY REFERENCE MADE A PART HEREOF.

WP 1833

EXHIBIT "A"

LAND DESCRIPTION

A 10 foot strip of tide and submerged land located in the Pacific Ocean, north of Point Arena, Mendocino County, California, lying 5 feet on each side of the described centerline:

COMMENCING at a point at Latitude 38° 58.92' N, Longitude 123° 42.35' W; thence northwesterly on an azimuth of 306.3° to the ordinary high water mark of the Pacific Ocean and the POINT OF BEGINNING; thence continuing northwesterly on the azimuth of 306.3°, 12,410 feet; thence northwesterly on an azimuth of 315.3° to a point on the offshore ownership boundary of the State of California as determined according to the decree entered by the United States Supreme Court in United States v. California, Original No.5 on Jan. 31, 1966, 382US488, and the end of the herein described line.

This description is based upon the California Coordinate System of 1927, Zone 2.

END OF DESCRIPTION

PREPARED AUGUST 5, 1987 BY BIU #1

0535b

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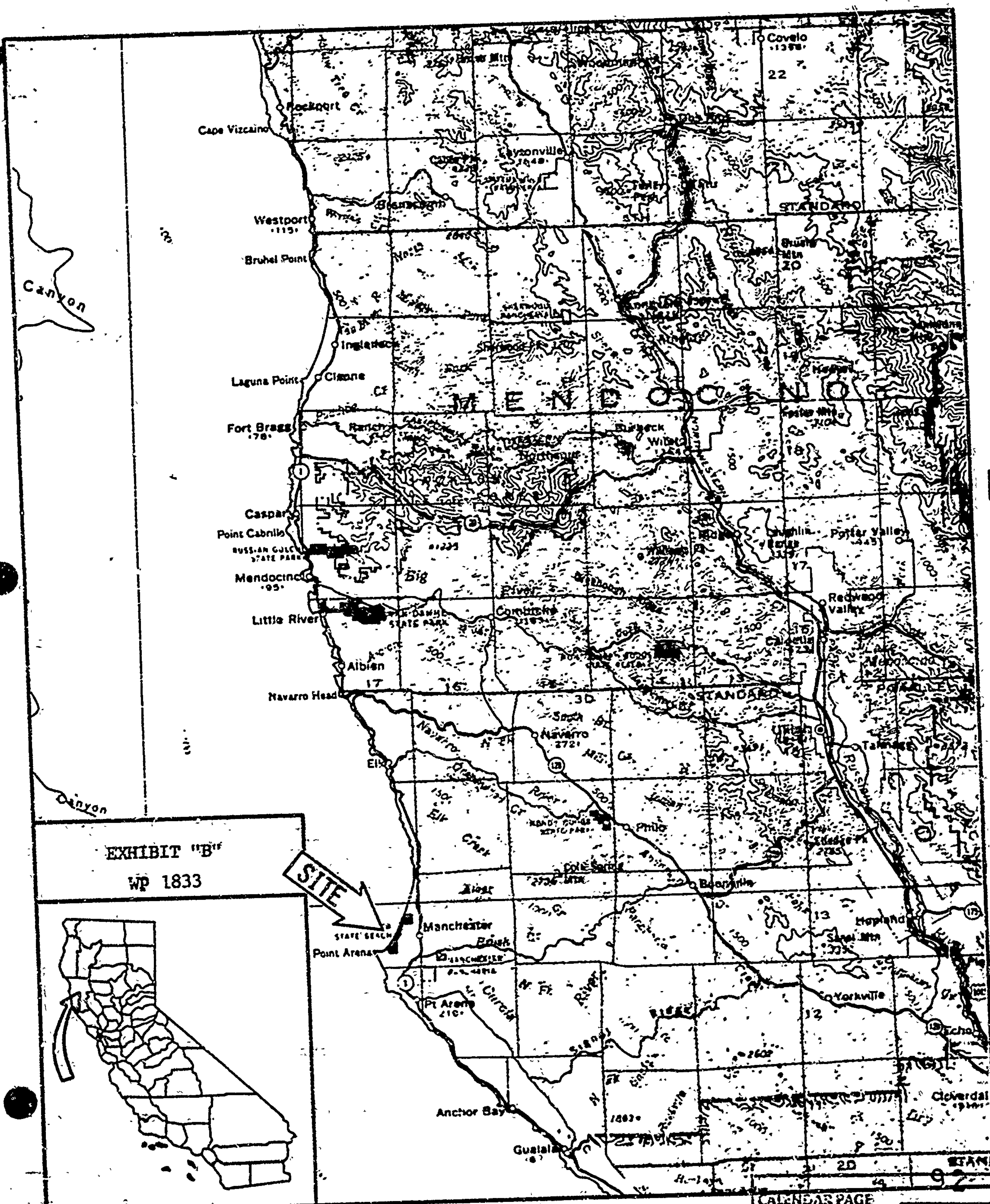

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STATE LANDS COMMISSION
1807 13TH STREET
SACRAMENTO, CALIFORNIA 95814

EXHIBIT "C"

PROPOSED NEGATIVE DECLARATION

EIR ND 424

File Ref.: WP 1833

SCH#: 87081105

Project Title: AT & T Pt. Arena - Hawaii Cable

Project Proponent: AT & T

Project Location: Pt. Arena, Mendocino County, to Hawaii

Project Description: Placement of a 2-inch diameter fiber optic cable in a trench to the edge of the outer continental shelf (approximately 40 miles); from that point to Hawaii, the cable will lie on the ocean floor.

Contact Person: Dan Cohen **Telephone:** (916) 324-8497

This document is prepared pursuant to the requirements of the California Environmental Quality Act (Section 21000 et seq., Public Resources Code), the State CEQA Guidelines (Section 15000 et seq., Title 14, California Administrative Code), and the State Lands Commission regulations (Section 2901 et seq., Title 2, California Administrative Code).

Based upon the attached Initial Study, it has been found that:

[X] the project will not have a significant effect on the environment.

[ ] mitigation measures included in the project will avoid potentially significant effects.

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STATE OF CALIFORNIA—STATE LANDS COMMISSION GEORGE DEUKMEJIAN, Governor

STATE LANDS COMMISSION
1807 13TH STREET
SACRAMENTO, CALIFORNIA 95814

To: All Interested Agencies and Parties

Date: August 11, 1987

File Ref.: WP 1833

SCH No.: 87081105

Subject: CONSULTATION PURSUANT TO PUBLIC RESOURCES CODE SECTION 21080.3

The State Lands Commission is the Lead Agency for the purpose of the California Environmental Quality Act for the proposed project described below and in the attached material:

Project Title: AT&T Pt. Arena - Hawaii Cable

Project Proponent: AT&T

Project Location: Pt. Arena, Mendocino County, to Hawaii

Project Description: Placement of a 2-inch diameter fiber optic cable in a trench to the edge of the Outer Continental Shelf (approximately 40 miles); from that point to Hawaii, the cable will lie on the ocean floor.

Pursuant to Public Resources Code Sections 21080.1, 21080.2, and 21080.3, we request the position of your agency/organization as to whether an Environmental Impact Report(EIR) or a Negative Declaration(ND) should be prepared for this project. Please be specific as to whether you believe the document required is an EIR or ND.

In order to assure timely processing of this application, we further request that you respond by September 10, 1987 Should you have any questions, please telephone the undersigned at (916) 324-8497. Thank you very much for your cooperation in this regard.

ATTACHMENT

Dan Cohen
Environmental Specialist

Form 59, 36a (11/78)

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STATE LANDS COMMISSION

ENVIRONMENTAL IMPACT ASSESSMENT CHECKLIST – PART II

Form 13.20 (7/82)

File Ref.: WP 1833

I. BACKGROUND INFORMATION

A. Applicant: AT&T
Agent: Coates Field Service, Inc.
AT&T Bldg., 1425 Champa, Room 180
Denver, CO 80202

B. Checklist Date: 8 / 4 / 87

C. Contact Person: Dan Cohen
Telephone: (916) 324-8497

D. Purpose: To provide a state-of-the-art fiber optic communication cable to replace an existing coaxial cable.

E. Location: Pacific Ocean, from the Manchester Beach area in Mendocino County to Hawaii.

F. Description: AT&T proposes to lay a 2-inch diameter fiber optic cable in a trench from AT&T's facility at Point Arena to the edge of the Outer Continental Shelf (approximately 40 mi); from that point to Hawaii, the cable will lie on the ocean floor (see more extensive project description, infra)

G. Persons Contacted: State Clearinghouse - Designated State agencies through this consultation

II. ENVIRONMENTAL IMPACTS. *(Explain all "yes" and "maybe" answers)*

	Yes	Maybe	No
A. *Earth.* Will the proposal result in:			
1. Unstable earth conditions or changes in geologic substructures?			X
2. Disruptions, displacements, compaction, or overcovering of the soil?	X		
3. Change in topography or ground surface relief features?			X
4. The destruction, covering, or modification of any unique geologic or physical features?			X
5. Any increase in wind or water erosion of soils, either on or off the site?			X
6. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet, or lake?			X
7. Exposure of all people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?			X

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	Yes	Maybe	No
B. *Air.* Will the proposal result in:			
1. Substantial air emmissions or deterioration of ambient air quality?			X
2. The creation of objectionable odors?			X
3. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?			X
C. *Water.* Will the proposal result in:			
1. Changes in the currents, or the course or direction of water movements, in either marine or fresh waters?			X
2. Changes in absorption rates, drainage patterns, or the rate and amount of surface water runoff?			X
3. Alterations to the course or flow of flood waters?			X
4. Change in the amount of surface water in any water body?			X
5. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity?	X		
6. Alteration of the direction or rate of flow of ground waters?			X
7. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations?			X
8. Substantial reduction in the amount of water otherwise available for public water supplies?			X
9. Exposure of people or property to water-related hazards such as flooding or tidal waves?			X
10. Significant changes in the temperature, flow or chemical content of surface thermal springs?			X
D. *Plant Life.* Will the proposal result in:			
1. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)?			X
2. Reduction of the numbers of any unique, rare or endangered species of plants?			X
3. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?			X
4. Reduction in acreage of any agricultural crop?			X
E. *Animal Life.* Will the proposal result in:			
1. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms, or insects)?			X
2. Reduction of the numbers of any unique, rare or endangered species of animals?			X
3. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?			X
4. Deterioration to existing fish or wildlife habitat?			X
F. *Noise.* Will the proposal result in:	X		
1. Increase in existing noise levels?			X
2. Exposure of people to severe noise levels?			X
G. *Light and Glare.* Will the proposal result in:			
1. The production of new light or glare?			X
H. *Land Use.* Will the proposal result in:			
1. A substantial alteration of the present or planned land use of an area?			X
I. *Natural Resources.* Will the proposal result in:			
1. Increase in the rate of use of any natural resources?			X
2. Substantial depletion of any nonrenewable resources?			X

	Yes	Maybe	No
J. *Risk of Upset.* Does the proposal result in:			
1. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation) in the event of an accident or upset conditions?	☐	☐	☒
2. Possible interference with emergency response plan or an emergency evacuation plan?	☐	☐	☒
K. *Population.* Will the proposal result in:			
1. The alteration, distribution, density, or growth rate of the human population of the area?	☐	☐	☒
L. *Housing.* Will the proposal result in:			
1. Affecting existing housing, or create a demand for additional housing?	☐	☐	☒
M. *Transportation/Circulation.* Will the proposal result in:			
1. Generation of substantial additional vehicular movement?	☐	☐	☒
2. Affecting existing parking facilities, or create a demand for new parking?	☐	☐	☒
3. Substantial impact upon existing transportation systems?	☐	☐	☒
4. Alterations to present patterns of circulation or movement of people and/or goods?	☐	☐	☒
5. Alterations to waterborne, rail, or air traffic?	☐	☐	☒
6. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians?	☐	☐	☒
N. *Public Services.* Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:	☐	☐	☒
1. Fire protection?	☐	☐	☒
2. Police protection?	☐	☐	☒
3. Schools?	☐	☐	☒
4. Parks and other recreational facilities?	☐	☐	☒
5. Maintenance of public facilities, including roads?	☐	☐	☒
6. Other governmental services?	☐	☐	☒
O. *Energy.* Will the proposal result in:			
1. Use of substantial amounts of fuel or energy?	☐	☐	☒
2. Substantial increase in demand upon existing sources of energy, or require the development of new sources?	☐	☐	☒
P. *Utilities.* Will the proposal result in a need for new systems, or substantial alterations to the following utilities:			
1. Power or natural gas?	☐	☐	☒
2. Communication systems?	☒	☐	☐
3. Water?	☐	☐	☒
4. Sewer or septic tanks?	☐	☐	☒
5. Storm water drainage?	☐	☐	☒
6. Solid waste and disposal?	☐	☐	☒
Q. *Human Health.* Will the proposal result in:			
1. Creation of any health hazard or potential health hazard (excluding mental health)?	☐	☐	☒
2. Exposure of people to potential health hazards?	☐	☐	☒
R. *Aesthetics.* Will the proposal result in:			
1. The obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?	☐	☐	☒
S. *Recreation.* Will the proposal result in:			
1. An impact upon the quality or quantity of existing recreational opportunities?	☐	☐	☒

	Yes	Maybe	No
T. *Cultural Resources.*			
1. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archeological site?	☐	☐	☒
2. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?	☐	☐	☒
3. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?	☐	☐	☒
4. Will the proposal restrict existing religious or sacred uses within the potential impact area?	☐	☐	☒
U. *Mandatory Findings of Significance.*			
1. Does the project have the potential to degrade the quality of the environment, reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒
2. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☐	☒
3. Does the project have impacts which are individually limited, but cumulatively considerable?	☐	☐	☒
4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒

III. DISCUSSION OF ENVIRONMENTAL EVALUATION *(See Comments Attached)*

A.2: A trench (minimum 6-foot depth) will be dug from AT&T's property to the mean low water line (approximately 363 feet), the cable will be buried, and the trench back-filled. From the MLWL to a water depth of 60 feet, the cable will be retro-buried with water jetting equipment (trench depth decreasing from 6 feet to 2 feet). At depth greater than 60 feet the cable will be buried in a 2 foot trench by a tethered unmanned remote device ("SCARAB" - see enclosed description). All trenches will be back-filled. All surface contours will be restored, and beachfront plants will be replaced.

C.5: Trenching activities will cause some turbidity on the ocean floor. Such impacts, however, will be very minor and of short duration.

F.1: The onshore trenching activities will cause a minimal, short-term, unavoidable increase in existing noise.

M.1, 5: The cable ship, diver support vessels, and tugboats will add to existing boat traffic, but are not anticipated to cause significant impacts.

P.2: Alteration will occur through installation of an improved telecommunications system.

IV. PRELIMINARY DETERMINATION - To be made at the conclusion of the consultation period.

On the basis of this initial evaluation:

☐ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION will be prepared.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Dan Cohen, Env. Specialist

For the State Lands Commission

Date: 8 / 4 / 87

AT&T ENVIRONMENTAL IMPACT ASSESSMENT
POINT ARENA, CALIFORNIA TO MAKAHA, HAWAII
SUBMARINE LIGHTGUIDE (FIBER-OPTIC) CABLE HAW-4

PROJECT DESCRIPTION

A consortium of U.S. and Canadian firms, with AT&T as principal, proposes to construct, maintain and operate a submarine lightguide (fiber-optic) communication cable (Haw-4) between the existing AT&T facilities at Point Arena, Ca., and Makaha, Hawaii on the island of Oahu.

The project consists of laying a 2 inch diameter fiber-optic communication cable in a trench from AT&T's facility at Point Arena, to the edge of the outer continental shelf, i.e. approximately 40 miles. Between the outer continental shelf and Hawaii, the cable will lie on the ocean floor.

On AT&T's property, a trench will be dug to a minimum depth of 4 feet using either a trencher or a backhoe with a crew of about 10 workers plus an Engineer-Inspector.

From the edge of AT&T's property (see copy of enclosed sketch for details) at the existing SCARF line, a trench will be dug for a distance of 362.5 feet to the mean low water line. The trench will have a minimum depth of six (6) feet. In this area, shoring will be used as required by OSHA safety standards. From this point to a water depth of 60 feet, the cable will be retro-buried by divers using water jetting equipment. The trench depth will gradually decrease six feet (at the mean low water line) to 2 feet. At ocean depths greater than 60 feet, cable burial will be accomplished by use of a tethered unmanned remote controlled piece of equipment called a SCARAB (see enclosed description of the SCARAB). The SCARAB will be operated from the cable ship long lines and will be used to dig a trench 2 feet deep to the edge of the outer continental shelf.

The SCARAB travels over the cable and uses water jets to excavate a 2 foot deep trench in the soil on the ocean floor. The cable then falls into the trench and is covered with soil by the natural movement of the sea water.

The cable construction operation will start with the cable ship long lines (CSLL) sitting approximately one-half mile off-shore. The CSLL will carry all the cable necessary for the project (cable segments have been previously spliced with signal regenerator modules to form one continuous cable).
The CSLL will be assisted by diver support vessels and two tugboats; one large, one small. The large tugboat will stay by the CSLL and steady it during pulling operations. The small tugboat will pick up the cable from the CSLL and tow the cable to transfer buoy temporails anchored off the beach. The communications cable will be supported by floats placed at 30 foot intervals. A 3/4 inch solid wire rope cable will be attached to the communications cable and used to pull it into the trench.

Shore end landing equipment will be set up on AT&T's property. The shore end landing equipment will consist of a deadman anchor, two on-line targets, and a winch. A beach sheave and it's attendant tractor will probably not be used.
Communications during the cable pulling operation will be by VHF radio.
After the cable is pulled from the ship to the on-shore facility, it will be tested and placed in the previously dug trench.

The trench will then be immediately back-filled. Original ground contours will be restored and beach front plants will be replaced.

The cable pulling crew will consist of approximately 10 laborers, 8 divers and associated support and supervisory personnel.

No permanent above ground structures will be left after construction. Temporary above ground structures including excavation sheeting and shoring, cable ship alignment targets (see attached sketch), cable winch supports, and cable sheaves will be reused.

The on-shore trenching activities are scheduled to begin on April 25, 1988. Cable pulling will begin on May 19, 1988. Burial and final clean up and grading will be completed by June 1, 1988. During this period, limited access will be permitted across the beach except for a period of approximately five days during final trench excavation, cable pulling, and initial trench back-filling operations.

Once in operation, the fiber optic communication cable will be in continuous use for a minimum of 30 years.

The fiber optic communication cable replaces an existing coaxial communication cable. The old cable will be abandoned in place.

DESCRIPTION OF THE EXISTING ENVIRONMENT

The proposed routing of the cable across beach property not owned by AT&T will be on a 50 foot wide by 362.5 feet long (to the mean low water line) right-of-way.

See the enclosed geotechnical survey for the offshore portion of the project.

Also, see enclosed map of the ocean floor in fathoms.

ENVIRONMENTAL IMPACT

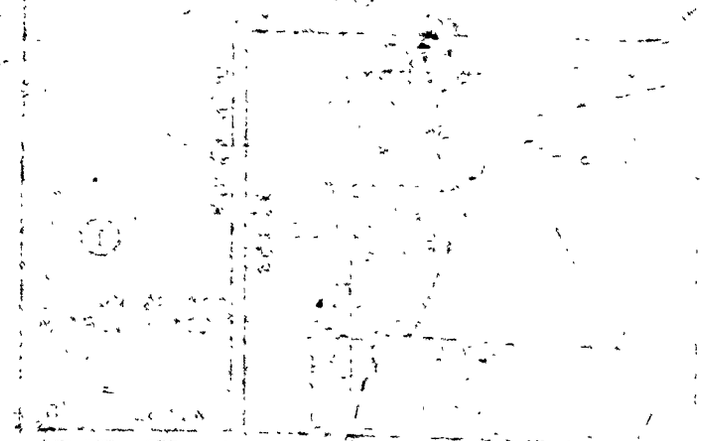
Because of the location and nature of the on-shore construction, there will be little or no impact to air quality, visual resources, surface and ground water quantity or quality, land contours, vegetation, soil or soil stability. Noise levels will not change - except briefly during construction. There will be a minor increase of water turbidity on the ocean floor due to trenching activities during construction. There is no known impact to populations of fish, plant, animal or marine life, including any threatened and/or endangered species, or national interest species. No kelp beds were encountered.

AT&T requested and received a listing of all species from the California Department of Fish and Game's Natural Diversity data base covering the shoreline and adjacent inland areas. This has been reviewed by the Department and no impacts were identified. The listing was prepared for the Point Arena to Dunnigan portion of AT&T's lightguide network, but covered the cable landing area on the shoreline.

No area will be disturbed having cultural resource values. Ann Peak and Associates have completed cultural clearances for the on-shore portion of cable as part of the Point Arena to Dunnigan project previously submitted to the State Lands Commission. There will be a highly beneficial impact to the American public in having reliable communication and data service. Also, the cost of the project construction will have a beneficial impact on the local economy.

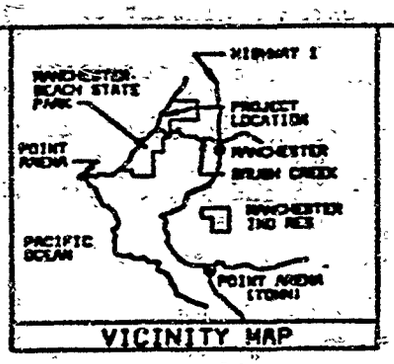
Application for permits have been filed with the U.S. Corps of Engineers (they have verbally stated that upon approval by the California Costal Commission, they will grant their Dredge and Fill Permit), the California Coastal Commission

(which will wait until after a Negative Declaration is filed by State Lands and grant of permits by Mendocino County), and Mendocino County (they will wait until after the Negative Declaration is filed). The California Department of Parks and Recreation has also been contacted.



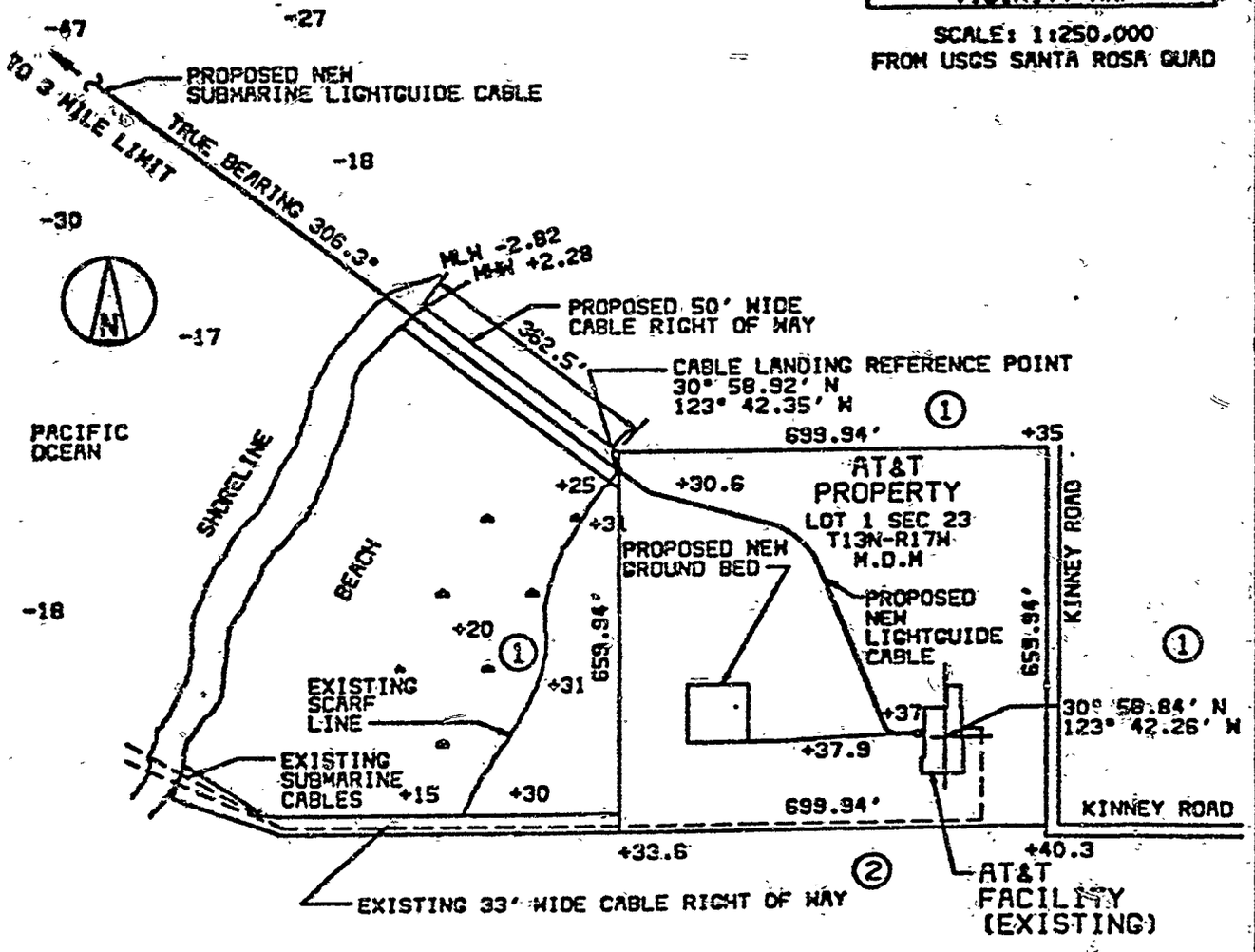
NOTES:

1. ELEVATIONS ARE IN FEET REFERENCE TO MSL..
2. AT&T = AMERICAN TELEPHONE AND TELEGRAPH COMPANY
3. MSL = MEAN SEA LEVEL
   MLW = MEAN LOW WATER
   MHW = MEAN HIGH WATER
4. CABLE BURIED 4' DEEP ON AT&T PROPERTY
5. PROJECT LOCATED APPROXIMATELY 1.25 MILES FROM MANCHESTER, CA.



VICINITY MAP

SCALE: 1:250,000
FROM USGS SANTA ROSA QUAD



PERMIT1

PURPOSE: INSTALLATION OF A SUBMARINE LIGHTGUIDE CABLE BETWEEN CALIFORNIA AND HAWAII

DATUM: MSL

ADJACENT PROPERTY OWNERS:

1. STATE OF CALIFORNIA DEPT OF PARKS & REC.
2. ~~JAMES P. BIAGGI~~

PLAN VIEW

0 300' 600'

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

5925 W. LAS POSITAS BLVD
ROOM G1033
PLEASANTON, CALIFORNIA
94566-0207

PROPOSED SUBMARINE LIGHTGUIDE CABLE INSTALLATION

IN: PACIFIC OCEAN AND BEACH AREA

AT: AT&T FACILITY NEAR MANCHESTER CALIFORNIA

COUNTY OF: MENDOCINO

APPLICATION BY: AT&T

CALENDAR PAGE J05

SHEET 1 OF 3 DATE 11-25-86

MINUTE PAGE

PERMIT2

PURPOSE: INSTALLATION OF A SUBMARINE LIGHTGUIDE CABLE BETWEEN CALIFORNIA AND HAWAII.

DATUM: MSL.

CABLE PLAN & PROFILE

MLW LINE OUT TO THREE MILE LIMIT

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

5925 W. LAS POSITAS BLVD
SUITE C1032
PLEASANTON, CALIFORNIA
94566-0207

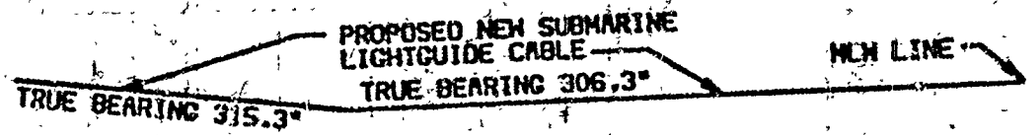
PROPOSED SUBMARINE LIGHTGUIDE CABLE INSTALLATION IN: PACIFIC OCEAN AND BEACH AREA

AT: AT&T FACILITY NEAR MANCHESTER CALIFORNIA

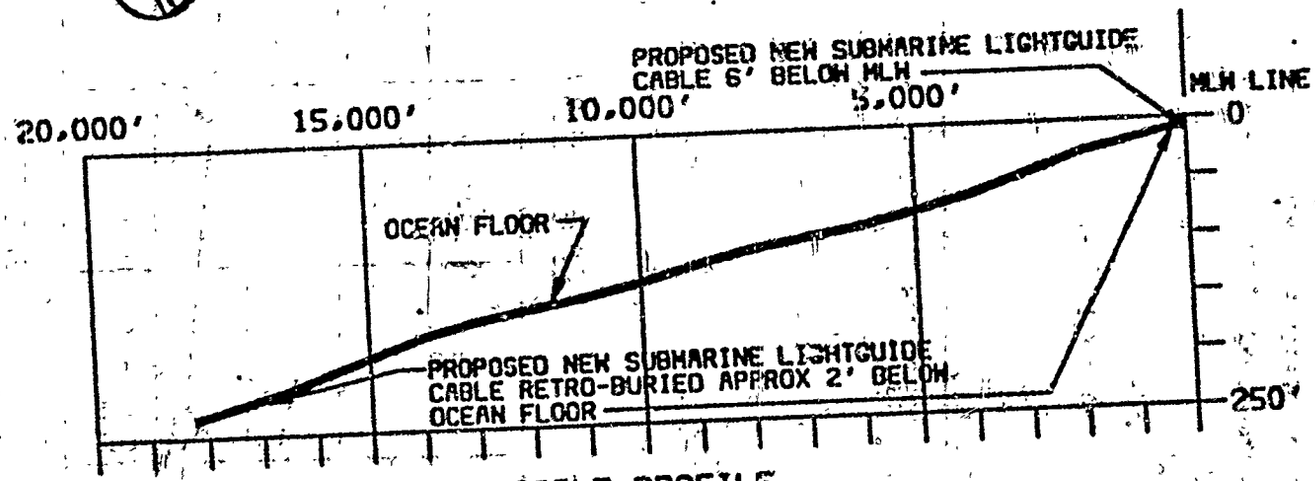
COUNTY OF: MENDOCINO

APPLICATION BY: AT&T

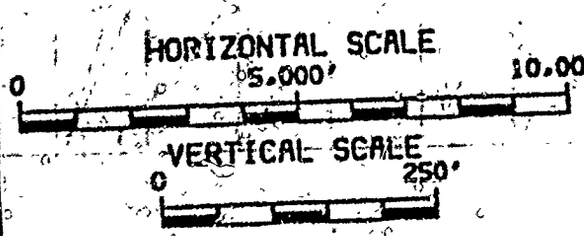
SHEET 2 OF 3 DATE: 11-25-86



CABLE PLAN



CABLE PROFILE



NOTES:

1. ELEVATIONS ARE IN FEET REFERENCE TO MSL.
2. AT&T = AMERICAN TELEPHONE AND TELEGRAPH COMPANY
3. MSL = MEAN SEA LEVEL
   MLW = MEAN LOW WATER
   MHW = MEAN HIGH WATER
4. CABLE BURIED 4' DEEP ON AT&T PROPERTY
5. PROJECT LOCATED APPROXIMATELY 1.25 MILES FROM MANCHESTER, CA.

MINUTE PAGE

3563

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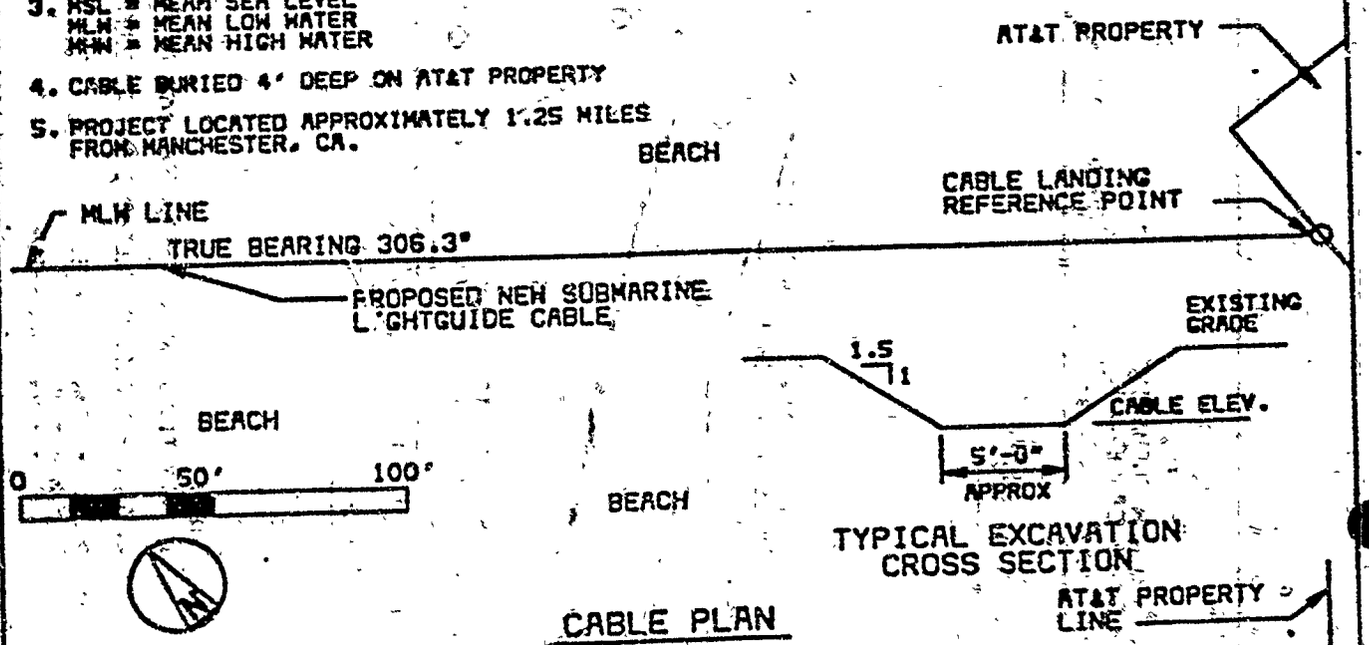
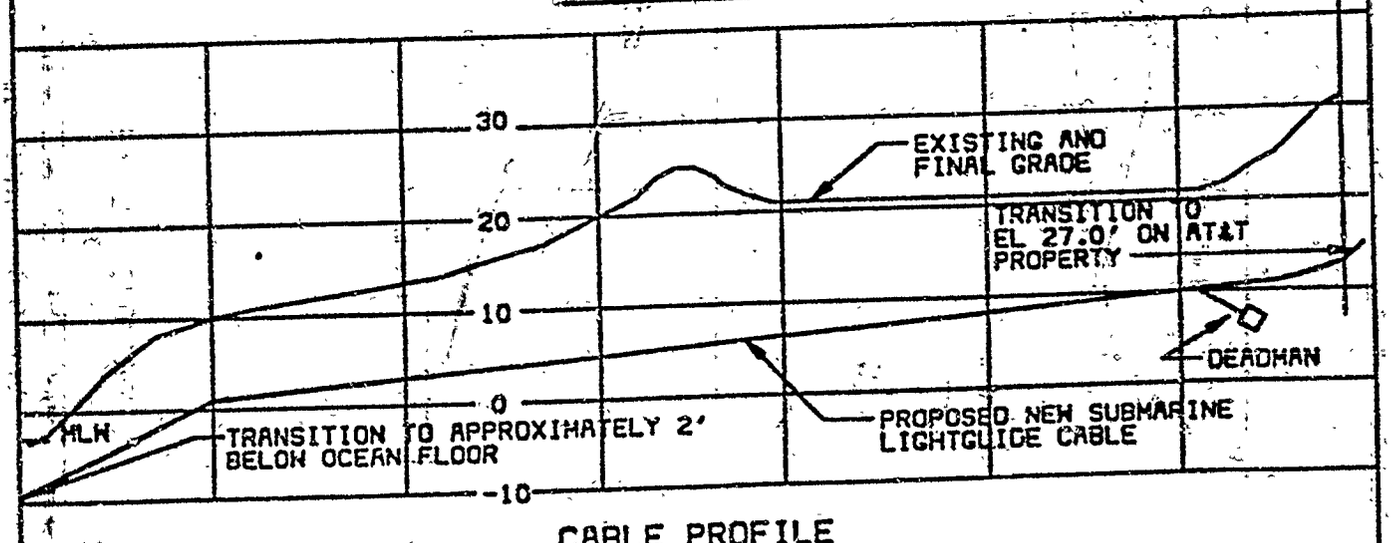




CABLE PROFILE

PURPOSE: INSTALLATION OF A SUBMARINE LIGHTGUIDE CABLE BETWEEN CALIFORNIA AND HAWAII

DATUM: MSL

CABLE PLAN & PROFILE

MLW LINE TO AT&T PROPERTY LINE

AMERICAN TELEPHONE AND TELEGRAPH COMPANY

5925 W. LAS POSITAS BLVD
ROOM G1033
PLEASANTON, CALIFORNIA
94566-0207

PROPOSED SUBMARINE LIGHTGUIDE CABLE INSTALLATION

IN: PACIFIC OCEAN AND BEACH AREA

AT: AT&T FACILITY NEAR MANCHESTER CALIFORNIA

COUNTY OF: MENDOCINO

APPLICATION BY: AT&T

CALENDAR PAGE 107

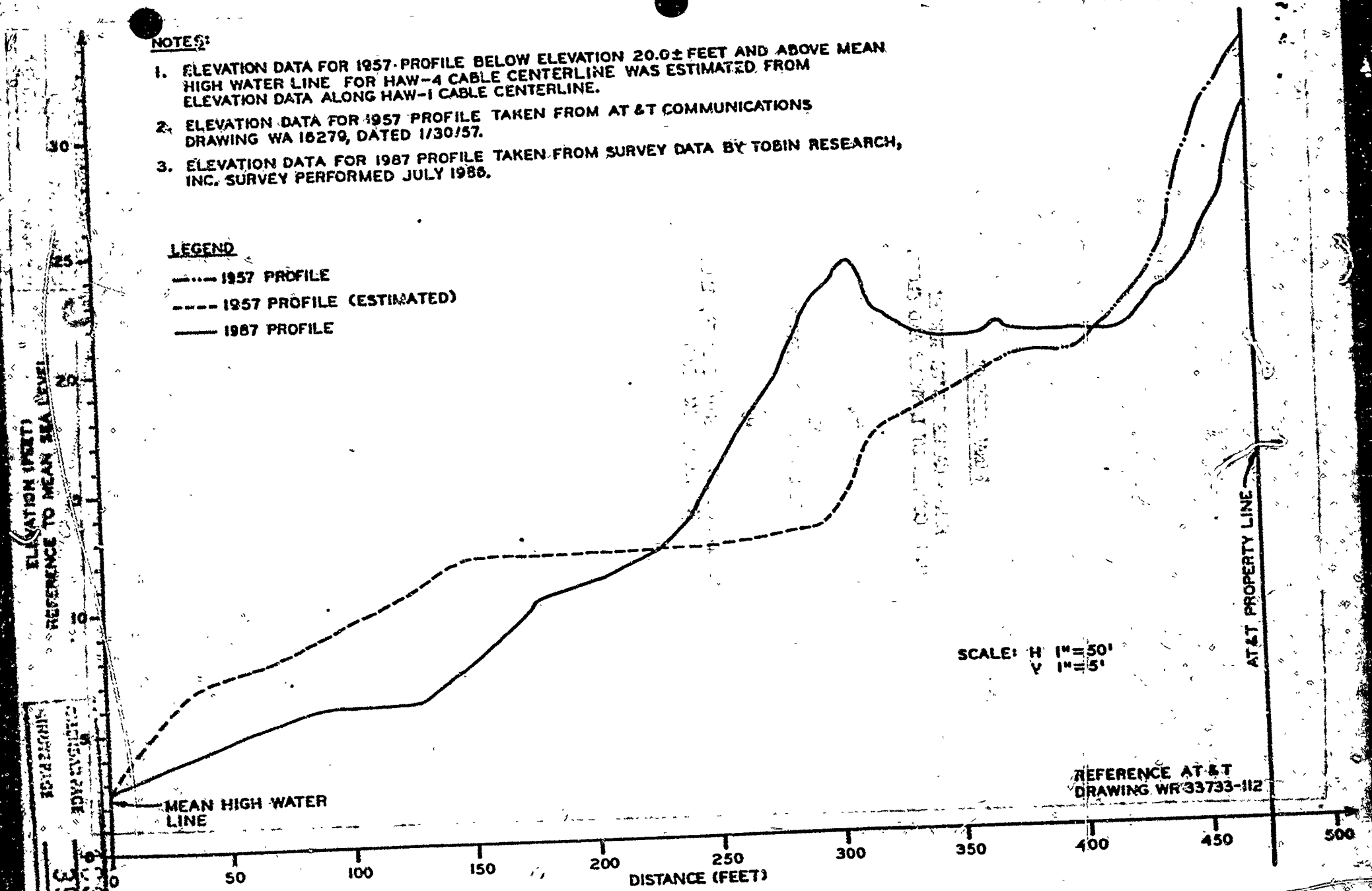
SHEET 3 OF 3 DATE 8-25-86

MINUTE PAGE 3564

PERMIT 3

NOTES:

1. ELEVATION DATA FOR 1957 PROFILE BELOW ELEVATION 20.0± FEET AND ABOVE MEAN HIGH WATER LINE FOR HAW-4 CABLE CENTERLINE WAS ESTIMATED FROM ELEVATION DATA ALONG HAW-1 CABLE CENTERLINE.
2. ELEVATION DATA FOR 1957 PROFILE TAKEN FROM AT & T COMMUNICATIONS DRAWING WA 16279, DATED 1/30/57.
3. ELEVATION DATA FOR 1987 PROFILE TAKEN FROM SURVEY DATA BY TOBIN RESEARCH, INC. SURVEY PERFORMED JULY 1988.



HAW-4 CABLE CENTERLINE PROFILE
AT & T PROPERTY LINE TO MEAN HIGH WATER LINE

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FINAL REPORT

HAW-4 CABLE ROUTE SURVEY
U.S. CONTINENTAL SHELF AND SLOPE

for

AT&T
MORRISTOWN, NEW JERSEY

by

ALPINE OCEAN SEISMIC SURVEY, INC.
NORWOOD, NEW JERSEY

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1.0 INTRODUCTION

Alpine Ocean Seismic Survey, Inc. is pleased to present the final report on the geophysical survey performed over the proposed route for the planned HAW-4 ocean cable system. The survey area is located off the coast of Northern California, starting just north of Pt. Arena, and extending over forty miles offshore to the west. The width of the survey area is one kilometer. Twelve lines at 75 meter line spacing were run parallel to the centerline over most of the route, using a side scan sonar, a 3.5 KHz subbottom profiler, and an echo sounder. The side scan sonar coverage provided one hundred percent overlap up to 250 meters water depth.

On the slope, from 250 meters to 675 meters depth, side scan was run on alternate lines only with data being acquired on the downslope direction.

The M/V GLORITA, a 148 foot research vessel designed for geophysical and sediment sampling, was chartered for the survey. The vessel was mobilized in Pt. Hueneme, California, and then sailed to the start of the survey area near Pt. Arena. The field work at the site commenced on August 25th and was completed on September 11, 1986.

2.0 SCOPE OF WORK

The survey was designed to provide the client with information pertaining to the bathymetry, the seabed morphology and the shallow

sediments along the proposed route. The data will be utilized to determine the suitability of the HAW-4 planned buried cable route or to make adjustments and changes in the proposed routing where required.

The cable is to be buried to a depth of 60 cm. in the seabed up to a water depth of 1000 meters. The survey extended from the shore at the Manchester, California, cable landing station to approximately 40 miles off shore.

The work consisted of two parts.

A. A geophysical survey that included:

1. Bathymetric profiling
2. Subbottom profiling
3. Side Scan Sonar Mapping
4. Subbottom sampling

B. A survey report on the geophysical and sediment sampling operations that includes the following presentations:

1. Navigation plan map of surveyed area
2. Sediment sampling sites plotted
3. Sea floor features and obstructions as revealed through the side scan sonar records, and presented on a plan map with symbols classifying the various identifiable features
4. Seismic profiles of the ocean floor and subbottom seismic reflectors, correlated with descriptive contents of the sediment cores

5. Log and geologic description of sediment cores, including shear strength analysis of soil samples
6. Photographic reproductions of representative side scan sonar records and subbottom data indexed and referenced on the plan maps
7. Text describing the various elements of the survey, the equipment used, field procedures, and discussions on the seismic reflection findings, the sea bed topography and obstructions, and the nature of sediments encountered.

3.0 METHODOLOGY

3.1 PROPOSED SURVEY ROUTE

The survey route from the shoreline to the deep water end was chosen by AT&T, and coordinates in latitude and longitude of alter course points and points on line provided to Alpine Ocean Seismic Survey, Inc.

During the proposal stage, additional information on existing bottom sediment conditions was made available to AT&T by Keyex, Inc. This data showed a large rocky outcrop area existing across the designed route. A new route with a large offset to avoid the rocky area was planned out by AT&T. The new latitude-longitude points were converted to UTM and used as the basis for generating the working field navigation control. The individual alter course points and points on line are presented in Table 1.

3.2 EQUIPMENT

3.2.1 Navigation Control

The cable route survey required an accurate navigation system which could operate in the foggy conditions known to exist offshore of California. The Syledis system was chosen for this survey for its better performance in foggy conditions at the ranges required . Four beacon stations were used. The stations were established at points with known benchmarks. The first point, which is very near the cable landing station at Manchester, is called station "Boyle." The next station is just north of the town of Elk on a promontory, and is called "Cuffy Cove." The Third point was near the light house at Point Cabrillo, with the actual point "Cabrillo 2" as the original point was destroyed by shore erosion. The fourth point is called Abalone Point 2, which is located about three miles north of the town of Westport, California. The coordinates for these points are given in the Appendix.

The stations were used to provide three range navigation control for the vessel. The ranges were converted to meters and fed directly to the on-board computer/plotter system which determined the X-Y position of the vessel in UTM coordinates. The computer updated the vessel location along the track line and stored navigation fixes on magnetic tape at one minute intervals.

The three-range navigation control was available for all but the deeper water area surveyed first, when only two beacons could be picked up and used.

For the three-range navigation, the computation of standard deviation as a measure of the size of the triangle made by the intersecting range arcs was printed for each fix during the survey. This measure of error was rarely more than ten meters, and was generally less than five meters. Approximately, 3000 points were acquired during the survey.

The vessel was able to stay within thirty meters of all pre-plotted lines and, for more than seventy percent of the survey, was within ten meters of the pre-plotted lines.

3.2.2 Bathymetry

The water depths encountered during the survey of the cable route varied from 4 meters to 3275 meters. This extensive range of water depths required the use of an echo sounder with frequency and power to reach the 3275 meter depth. An EDO 12 KHz system, monitored and keyed by an EPC 4200 recorder, and an Innerspace 404 Depth Digitizer were used for the water depth surveying. The sound velocity was pre-set to 1500 meters per second for the entire survey. Water depths at navigation fix points were fed from the depth digitizer to the computer for storage.

3.2.3 Subbottom Profiling

The O.R.E. model 1036 Subbottom Profiler with a four transducer array and a model 140 transceiver was used for the survey. The data were recorded on an EPC model 4800 19 inch graphic recorder. The recorder was set at 62.5 millisecond (1/16 second) per sweep display. This sweep, assuming a speed of sound in the water of 4800

feet/second, makes the timing lines on the recorder equal to fifteen feet. Time delay was used to eliminate part of the water column. The 62.5 millisecond sweep was maintained to a water depth of about one hundred meters along the route, where the sweep was changed to 125 milliseconds display. From 1000 meters to 3275 meters, the system was operated at either 500 or 1000 seconds per sweep. To eliminate or reduce the wave action, an O.R.E. model 1064 heave compensator was used. The sensor for this unit consists of an accelerometer which is placed on deck next to the 3.5 KHz transducer mount. The accelerometer provides a voltage which is used to cancel the effect of the waves on the record.

The O.R.E. 3.5 KHz system was operated at less than half power, i.e. 4000 watts out of the 10,000 watts capability, with pulse length at 0.2 or 0.5 m/sec. Time variable gain was used to help improve data quality. The received frequency was tuned to 4.0 KHz. This was found to be a good compromise between resolution and penetration.

Penetration of the signal into the subbottom varied from less than one meter in very hard sediments to well over thirty meters in areas of soft sediments. Resolution of 0.5 meters between closely spaced layers was obtained over much of the slope where numerous interbedded silt and clay layers were seen.

3.2.4 Side Scan Sonar

For the side scan sonar survey, a Klein Model 400 series system with a tow fish operated at a frequency of 100 KHz and a narrow (1°) horizontal beam width was used. A Klein depressor wing weighing

about seventy pounds kept the fish stable. Up to 7500 feet of cable was deployed from an electric hydraulic remotely controlled winch. The amount of cable laid out was measured through a remote readout mater wheel to determine the set back of the fish from the navigation antenna on the vessel. The scale setting used on the recorder was 75 meters per channel at all times. Since lina spacing was 75 meters, one hundred percent overlap of data was obtained. The tow fish was kept between five and fifteen meters above the sea floor.

3.2.5 Sediment Sampling

Fifteen potential sites for sediment sampling were chosen along the route. The procedure used to obtain the samples at these sites was to use the 2000 lb. coring weight with a 10 foot pipe. The corer was lowered to the ocean bottom by allowing the winch to free-spool. When the sampler hit bottom, the winch was put in gear and the sampler retrieved. If there was no recovery on the first attempt, the same procedure was tried once more. Only core site one, nearest to shore, required two attempts and there was still no recovery.

All other sample sites encountered soft sediments underlain by stiffer clays, and cores 0.50 to 2.10 meters long were obtained.

3.2.6 Vessel

The offshore survey was carried out using the M/V GLORITA. This vessel, a 148 foot research vessel based in southern California, had the size and duration required to perform this survey in a timely manner with minimum loss of ship time due to weather and reprovisioning.

The vessel has a spacious laboratory located on the lower deck in the center of the vessel. A winch for the sediment sampling operation, holding 7000 feet of one-half inch wire is part of the ship's normal equipment. A separate electric hydraulic winch for the side scan sonar was mounted on the back deck and the cable fair-led to the vessel's stern "A" frame.

The vessel has the following specifications:

Length	148 feet
Beam	27 feet
Draft	13.5 feet
Speed	10 Knts.
Range	8000 miles
Engines	Two 350 Hp. diesels, twin screws
Generators	Three 150 Kw. each

Air conditioned and heated

Navigation and Communication Systems

2 Radars - 24 mile and 32 mile range

Autopilot and Gyrocompass

Loran C

Radios - 5 (VHF, SSB and AM)

Facilities:

Laboratory - 25 x 15 feet

Deck space - 40 by 26 feet

Deck crane - 5 ton and 30 foot reach

Sediment Sampling Winch

Diesel powered, twin drum

7000 feet of 1/2" wire per drum

Sleeping quarters

10 - 2-man staterooms

4 - 1 man staterooms

Lounge

3.3 MOBILIZATION

The period of August 18 to august 20, 1986, was spent mobilizing the gear on the Glorita in Pt. Hueneme. After some adjustments to the autopilot system, the vessel spent two days steaming north to the anchorage at Pt. Arena Landing, located a few miles south of the inshore end of the survey route. During these days the shore beacon points were being set up and the beacons calibrated. This procedure was completed about 36 hours after the vessel arrived, and survey operations were commenced on August 25, 1986.

3.4 SURVEY OPERATIONS

The survey was started at a point near A/C 5, and lines run toward A/C 6. The side scan was not used on this part of the survey due to the excessive depths. Lines were run in this area for four days. The maximum distance achieved from a shore beacon point was over 70 Km. At a point a few miles west of A/C 6, only one beacon could be picked up, due partially to the height of the antenna on

land being only about fifteen meters above sea level. The water depth at this point was about 3300 meters. At this time the offshore survey was considered to be as complete as possible under the conditions prevailing, and the vessel steamed back toward Pt. Arena to start the nearshore part of the survey.

The first inshore section surveyed was from A/C 1 to the beach, followed by the sections from A/C 1 to the short bend between A/C 2 and A/C 3. During this part of the survey a long swell running at times almost ten feet in height from the Northwest was present. The swell did not bother the data significantly, as the lines were oriented either directly into or away from the swell. The above section of the survey was completed between August 28 and August 30. The remaining part of the survey lines were oriented parallel to the swell. This made operations difficult, and caused the bathymetry and subbottom transducers to roll almost out of the water, causing a great loss in data quality. At this point, the acquisition of seimic data was halted, and the coring equipment prepared to take the gravity cores at the fifteen proposed sites.

The sampling was completed by midnight of August 31. Since the swells were still running high, the vessel anchored at Pt. Arena to wait for improvements in the weather.

Surveying offshore was restarted on September 1, and completed on September 4, at which time the GLORITA offloaded some of the gear and people, and headed for Port Hueneme to complete the demobilization.

Small boat nearshore operations were conducted during the period of September 5 to 11. The operations included some onshore surveying of control points around the cable landing station at Manchester, and profiling of the portion of the route from the Northwest corner of the property to beyond the low water line in the surf. An initial attempt to launch a Zodiac showed that this type of operation could not be accomplished through the prevailing surf, and a boat of 21 feet in length was chartered in Albion, located over twenty miles north of the survey area. The vessel was on standby for weather from September 8 through the 10. The survey was completed using two range Del Norte navigation and Raytheon echo sounding equipment on September 11, and the remaining equipment demobilized.

4.0 DATA REDUCTION

4.1 NAVIGATION

During the two day steam back to P . Huename all fix data originally plotted at 1:10,000 scale were replotted at the appropriate scale for each section. This scale varied from 1:5,000 near shore to 1:25000 offshore. These data were then used as the basis for the presentation of the bathymetry, side scan and subbottom data.

4.2 BATHYMETRY

Using the new navigation post plots, bathymetry maps were drawn

using the data stored on the computer tapes integrated with the analogue data. These data were contoured to a one meter interval on the flat area of the survey and at five or twenty five meter intervals on the steeper parts of the slope. (Figs 1A-4A)

4.3 SIDE SCAN SONAR

All of the side scan sonar data were reexamined in the office to make sure that no significant man-made or natural features were missed during the on-board interpretation of the data. Various features, such as trawler tracks, rock outcrops and ripple marks were noted and reported. (Figs 1B-4B)

4.4 SUBBOTTOM PROFILING

All the rolls of subbottom data were examined in each area to determine the presence of prominent stratification, rock outcrops, the presence of channels and other sedimentological or morphological features.

The subbottom profiles were interpreted up to the 1000 meter depth, and reduced using a vertical exaggeration of 1:50. Nearshore, where the horizontal scale was 1:5000, the vertical scale was 1:100 (1cm= 1m) and in the offshore area where the scale was 1:25000, the vertical scale was 1:500 (1 cm= 5 m). In the deeper part of the survey, some of the detail in the bedding was lost, due to this scale, but the major reflectors that indicate changes in the geology are presented. A centerline rpofile was presented on the morphology charts. (Figures 1B-4B)

4.5 SEDIMENT SAMPLES

Sediment sampling was carried out at fifteen sites, with recovery at all but one site. The recovery varied from 0.5 to 2.0 meters in length. The cores were split longitudinally, described, and photographed in color on board. The clay units present in the cores were tested by a hand held torvane instrument to determine shear strength at as many layers as possible. The core logs, torvane results, photographs and sample descriptions are given in the Appendix.

A representative geologic column was developed for each of the sediment sample locations. The vertical scale used is 1:25 (1 cm= 0.25 m). Where possible, the geophysical data were used to determine the sediment types in between cores in the upper five feet of the ocean bottom. The geological description of the cores and the locations of the cores are noted on the surface morphology maps.

4.6 BASE MAPS

AT&T provided four sets of mylar maps to be used for the survey data presentation. These maps are computer-generated, with the scale ranging from 1:5000 nearshore to 1:25000 offshore. The maps are scaled to the local UTM system with Latitude and Longitude grids superimposed.

The maps were used for the presentation of the bathymetry and ocean bottom morphology. The bathymetry map depicts the water depth contours at intervals varying from one to twenty-five meters, according to the steepness of the bottom, with single depths in addition to contours where the bottom was very flat.

The morphology maps depict the ocean bottom morphology and sediments as derived from the side scan sonar and subbottom seismic data and from the sediment samples. This chart also shows a reconstructed geological profile along the center line of the proposed cable route and a short sediment column from each of the sample sites. The morphology and bathymtry maps can be superimposed to allow simultaneous examination of all the data along the route.

5.0 DATA ANALYSIS

At the start of the survey we knew that the San Andreas fault intersects the coast less than two miles north of the cable landing, and that original surveyroute had to be modified to take into account the presence of a large rock outcrop area south of the route from A/C1 to A/C 4. With this background information in hand, the morphology of the ocean bottom along the surveyed route was quite surprising.

The data showed a remarkably smooth bottom, virtually free of faults, rock outcrops, steep troughs or valleys. The steeper parts of the continental slope were quite uniform with a large thickness of soft sediment accumulating on them, indicating a distinct lack of recent slumping or other activity.

The geology and morphology of each section of the route, as divided by the alter-course points are discussed below.

The nearshore section of the survey (A/C 1 to the shore landing point, Figures 1A and 1B) contained the hardest bottom in general. Two attempts to obtain samples with a 2000 lb gravity corer which was

allowed to freefall almost fifty meters met with little recovery. Small amounts of hard silt on the core pipe showed that the corer had only penetrated about ten centimeters. This sediment seemed to be similar to that which outcrops in the bluffs along the beach at the shore landing point, especially the light brown material present to the south along the bluff.

Nearshore, within the ten meter depth contour ripple marks, oriented parallel to the shore, were recorded on the side scan sonar. These ripples are indicative of the only sandy bottom found on the whole survey. The sand seems to increase in thickness to several meters toward shore, but this might be seasonal, representing the outer edge of an offshore sand bar, which could be removed or at least altered by strong winter wave activity.

There is one rock outcrop along the south edge of the survey route inside A/C 1. This rock seems to be an isolated outcrop, as there is little evidence of uneven hard reflectors in the subbottom data. See Figure 1.

The second section of the route between A/C 1 and A/C 2, and continuing part way to A/C 4, is characterized by a smooth evenly sloping bottom. There are no rock outcrops within the surveyed area, with the exception of a relatively flat hard bottom only one hundred meters wide located along the northern part of the route just west of A/C 3. This rocky area showed up prominently on the side scan. See Figure 2.

The subbottom reflectors are smooth and generally parallel to the bottom, except for the western part of the area which is near the

known regional rock outcrop. Here the subbottom layering begins to show a gentle upturning from east to west as the route approaches the short turn on the north. Once past the turn at A/C 3, the prominent subbottom layers begin to turn down to the west, forming a truncated anticline with its axis oriented north south across the ocean bottom.

There are a few areas in this section where the side scan showed pairs of drag marks across the bottom. These are generally oriented north-south, and are quite low in prominence. They might be remnants of bottom trawling activity, but no fishing vessels were seen in the area during the survey period.

In the A/C 1 to A/C 2 section, the cores are mostly fine sandy silt. From A/C2 to A/C 3, there is generally about 25 to 50 centimeters of very soft sediment over a stiffer clay layer. The underlying clay layer is much drier and harder than the overlying sediments. At core nine, the shear strength of the underlying older clay exceeds 1 Kg./cm^2.

The bottom remains remarkably smooth from A/C 3 to the edge of the shelf at the 135 meter contour, where a sharp increase in slope occurs. A few drag-like scars, similar to those found between A/C 1 and A/C 2, are present across this part of the survey.

From the 135 meter edge of the slope on, there is a marked increase in the depth of penetration of the seismic signals, an indication of an increase in the amount of soft sediment present. The amount of layers present on the original data was much more than could be presented on the sections due to the high vertical

exaggeration. This thickness of layers is indicative of a very stable region with only a slow sediment input. There are no rivers nearby which could have supplied much sediment to the outer shelf and slope.

Two similar features present on the slope appear to be very old slumps, indicating that a large block of sediment has moved down the slope leaving a large canyon-like scar across the route.

The more prominent of these features occurs around the five hundred meter mark. The canyon is much more pronounced on the north side of the surveyed swath, where its axis is much deeper, and quickly becomes smoother and shallower toward the south side. The change in depth of the bottom of the canyon is over one hundred meters across the one kilometer width of the surveyed area. The route should be deflected toward the south edge of the surveyed swath in this area to keep the topography smoother. Due to the scale used and the contour interval of twenty-five meters, the canyon-like scar does not show on the bathymetry contour map (Figure 3A), but the axis is mapped on the morphology chart, (Figure 3B). A section of the 3.5 Khz data is presented as Figure 3, showing the nature of the slump on the north side of the surveyed route.

The second feature is a noticeable change in the slope that takes place at about the nine hundred meter depth. There is not here the sharp slump appearance of the shallower feature, but just a change in the general nature of the slope, as the bottom generally flattens out for a short distance (Figure 4).

The ocean bottom morphology beyond the one thousand meter depth point is portrayed on Figure 4B, where the very steep nature of parts of the slope can be seen. This is especially true for the section between 1600 and 1800 meters.

6.0 SUMMARY

Few features were found on this survey which would cause an alteration in the proposed route. The bottom is remarkably smooth along the survey route, with only two rocky areas as noted on the figures. The sediments within the first fifty centimeters are very high inshore of a point between A/C 1 and A/C 2, as shown by Core One. Beyond that point, a layer of soft silt, generally more than fifty centimeters thick, is present on the ocean bottom over the rest of the route.

NAVIGATION CONTROL POINTS

BOYLE	X - 1,151,377.46 ft.	Y - 483,344.98 ft.
CUFFEY COVE	X - 1,508,076.17 ft.	Y - 541,836.80 ft.
CABRILLO 2	X - 1,584,708.04 ft.	Y - 617,852.34 ft.
ABALONE POINT	X - 1,493,896.24 ft.	Y - 733,570.11 ft.

APPENDIX

SOUTHWEST

ROCK OUTCROP INSHORE

OF A/C 1

SOUTHEAST

OCEAN BOTTOM

SIDE SCAN SONAR RECORD

FIG ONE

NAVIGATION ETX MARK

15 METERS

200 METERS

FOLD TO PAGE

FOLD TO PAGE

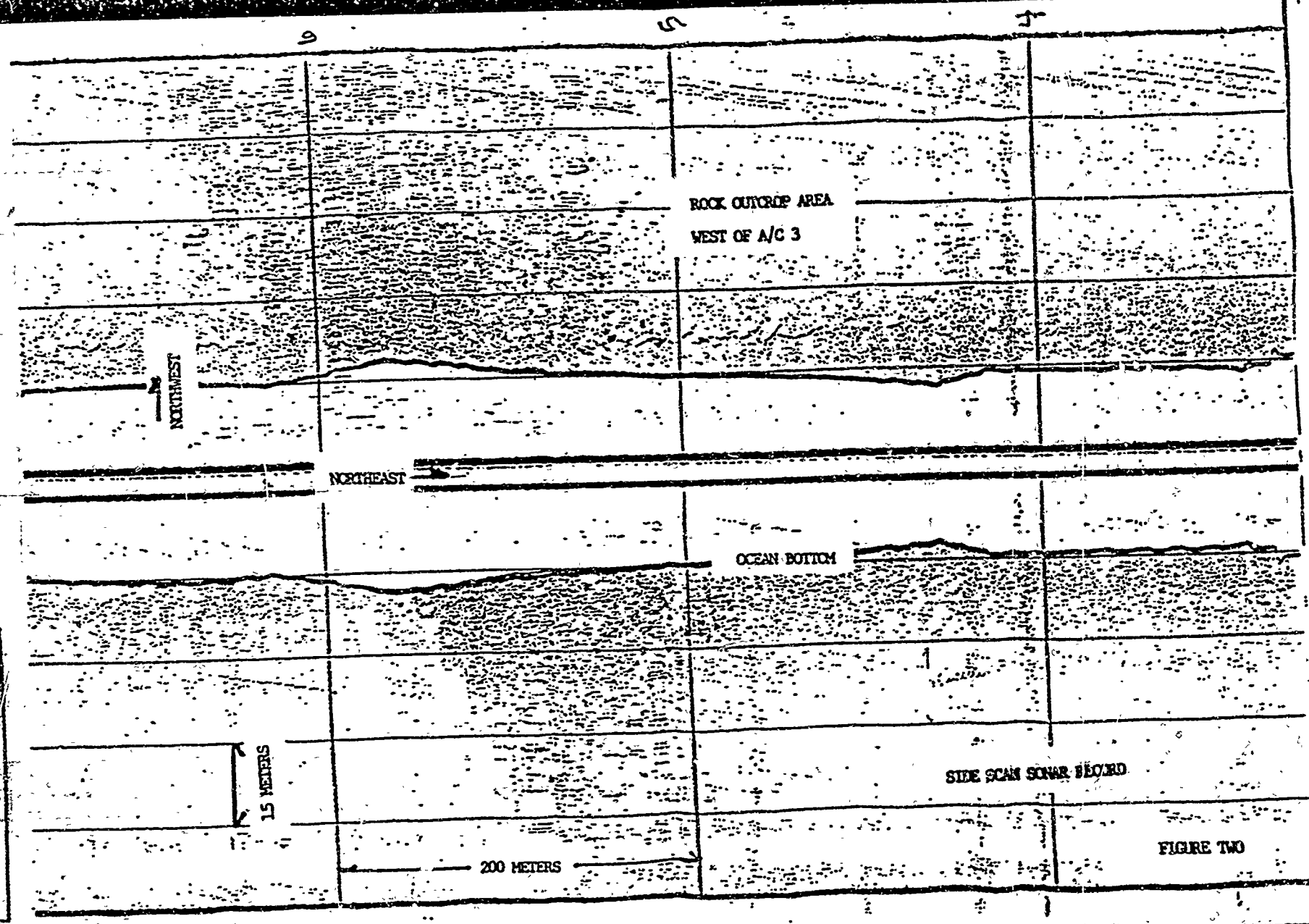


FIGURE TWO

3.5 KHZ SUBBOTTOM SEISMIC RECORD
FIGURE THREE
STEEP CANYON AND POSSIBLE OLD SLUMP BLOCK
NEAR 500 METER WATER-DEPTH CONTOUR
10 METERS
200 METERS

3.5 KHZ. SUBBOTTOM SEISMIC RECORD
SLOPE CHANGE NEAR
900 METER WATER DEPTH CONTOUR
10 METERS

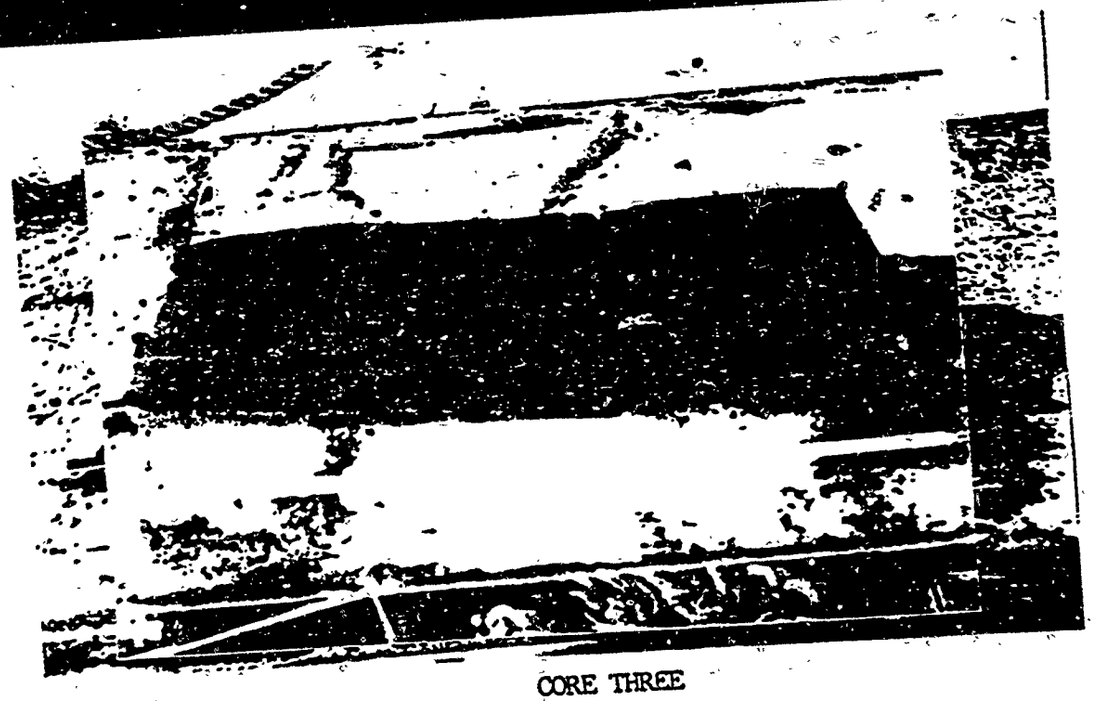
FIGURE FOUR

CORE ONE

Two attempts, No Recovery
Probably dense hard Silt

CORE TWO

0-50 Cm. Sand, very fine to Sandy Silt
dark green
Trace Shell Fragments
Torvane .08 Kg/cm^2 to .19 Kg/cm^2

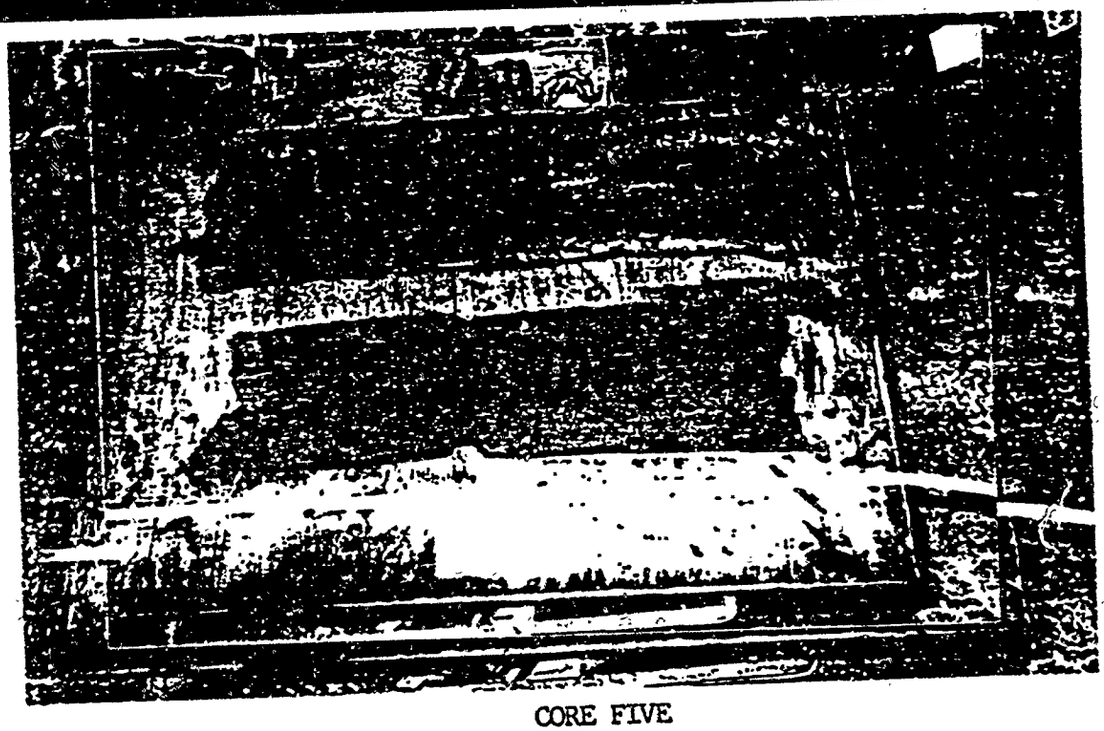


CORE THREE

0.48 Cm. Sandy Silt with finer
softer clayey lenses, trace
molluscs
Torvane .14 Kg/cm^2 to .19 Kg/cm^2

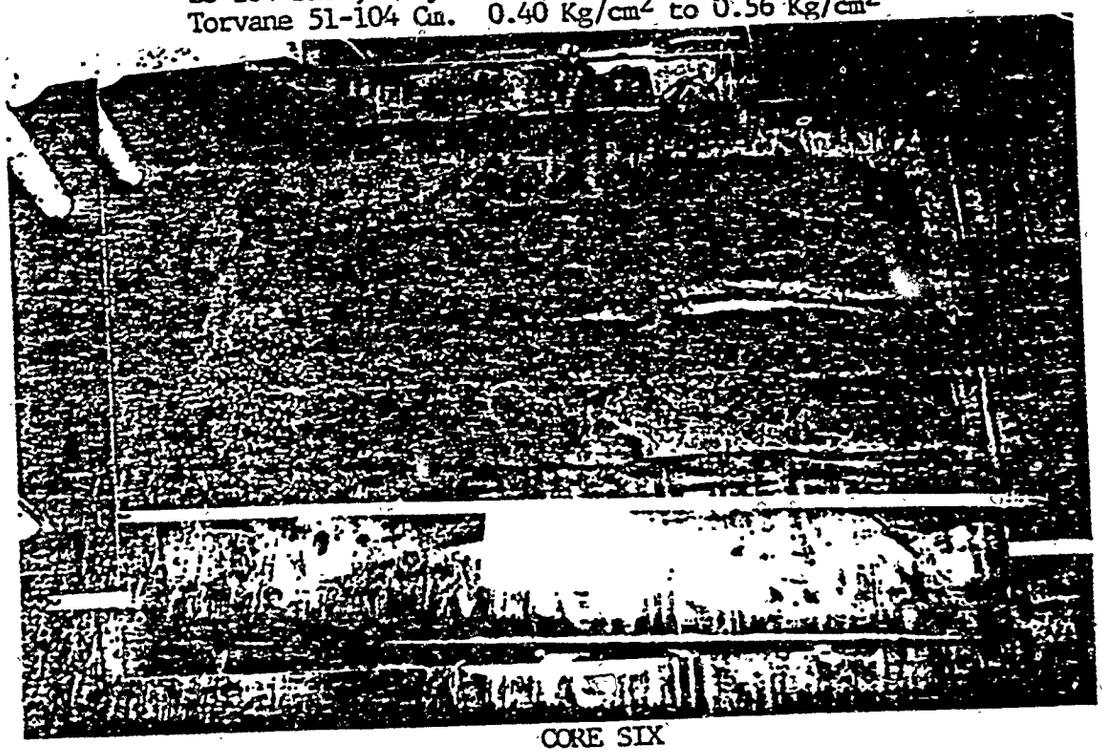
CORE FOUR

0.10 Cm. Silt, fine, dark green, very soft –
10-48 Cm. Silt, fine, soft, with
Shell Fragments, dark Green
48-86 Cm. Silt, fine dark green, dense
Torvane 48-86 Cm. -0.30-0.35 Kg/cm$_2$



CORE FIVE

0-28 Silt, very fine, dark green, very soft
28-104 Silt, very fine, dark green Shell Fragments
Torvane 51-104 Cm. 0.40 Kg/cm^2 to 0.56 Kg/cm^2



CORE SIX

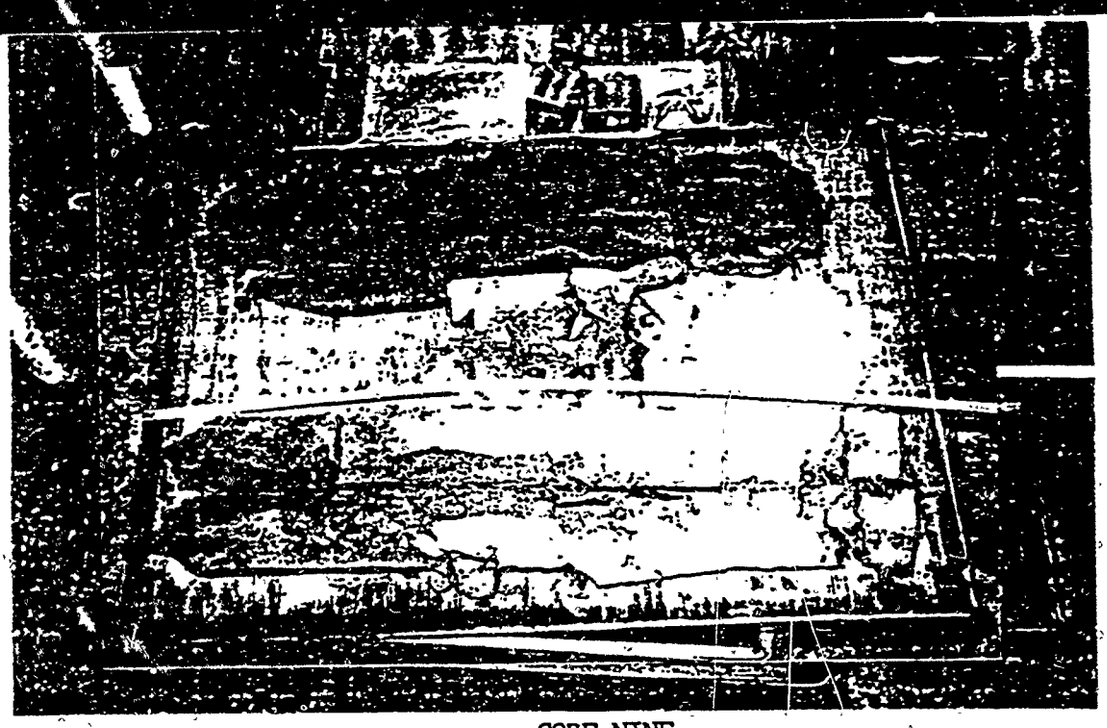
0-23 Cm. Silt, very soft
23-48 Silt, black to dark green, dense
48-76 Silt, dark green, very dense
76-86 Shell Hash
Torvane 48-76 Cm.
0.25 Kg/Cm^2 to 0.28 Kg/Cm^2

CORE SEVEN

0.47 Cm. Silt, dark green, soft
47-61 Coarse to fine Shell hash
Torvane 0-47
0.10 Kg/Cm^2 to 0.20 Kg/Cm^2

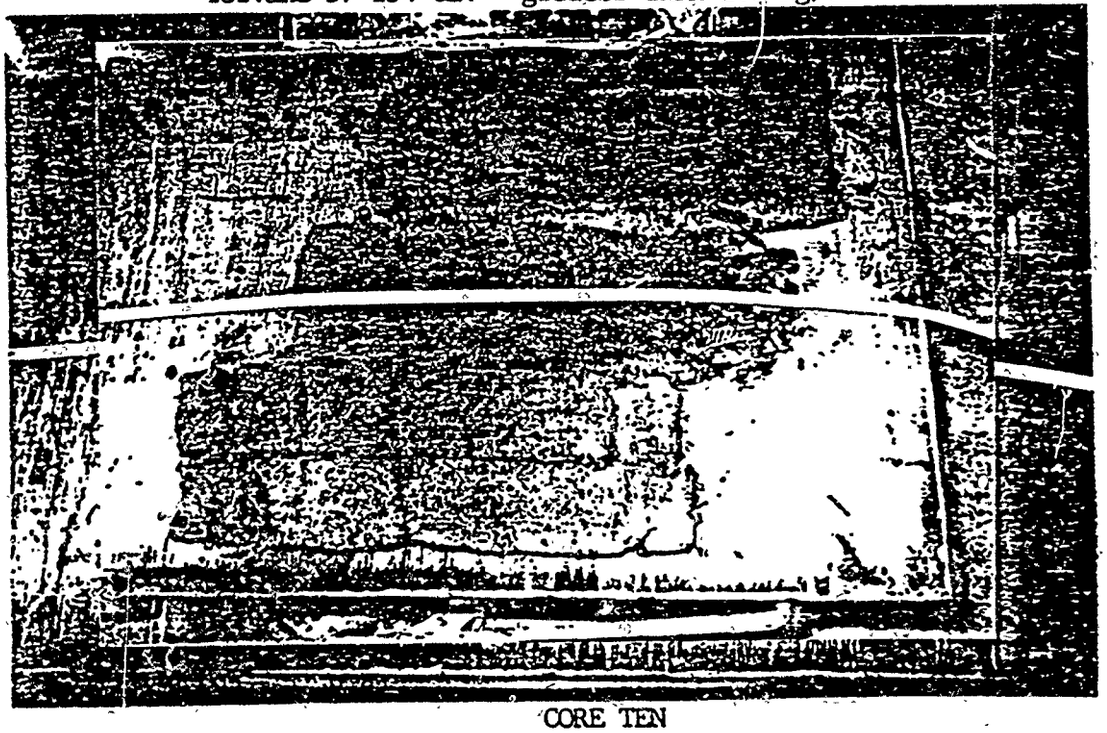
CORE EIGHT

0-46 Cm. Silt, dark green, soft
46-61 Silt, dark green, with Shell fragments, shell hash lens at 46 Cm.
Torvane- less than 0.05 Kg/Cm^2



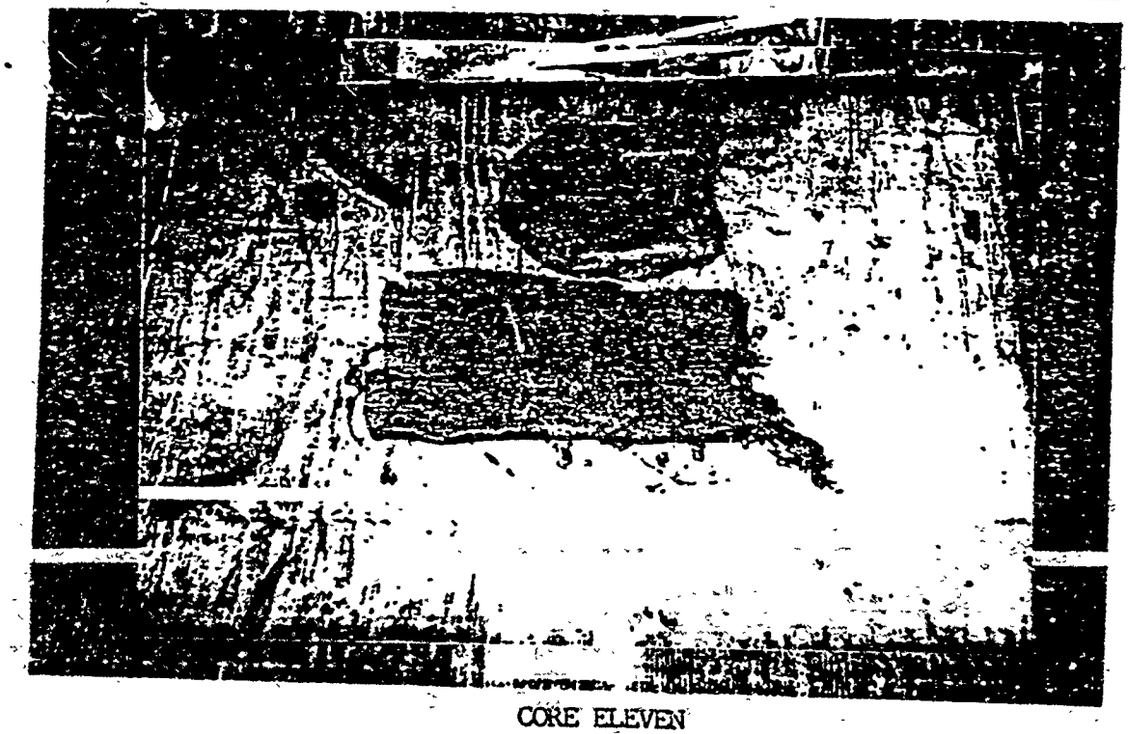
CORE NINE

0-13 Cm. Silt, very soft, liquid
13-57 Silt, soft with shell layer at 57 Cm.
57-134 Clay, Dark green, very dense
Torvane 57-134 Cm. greater than 1.0 Kg/Cm^2



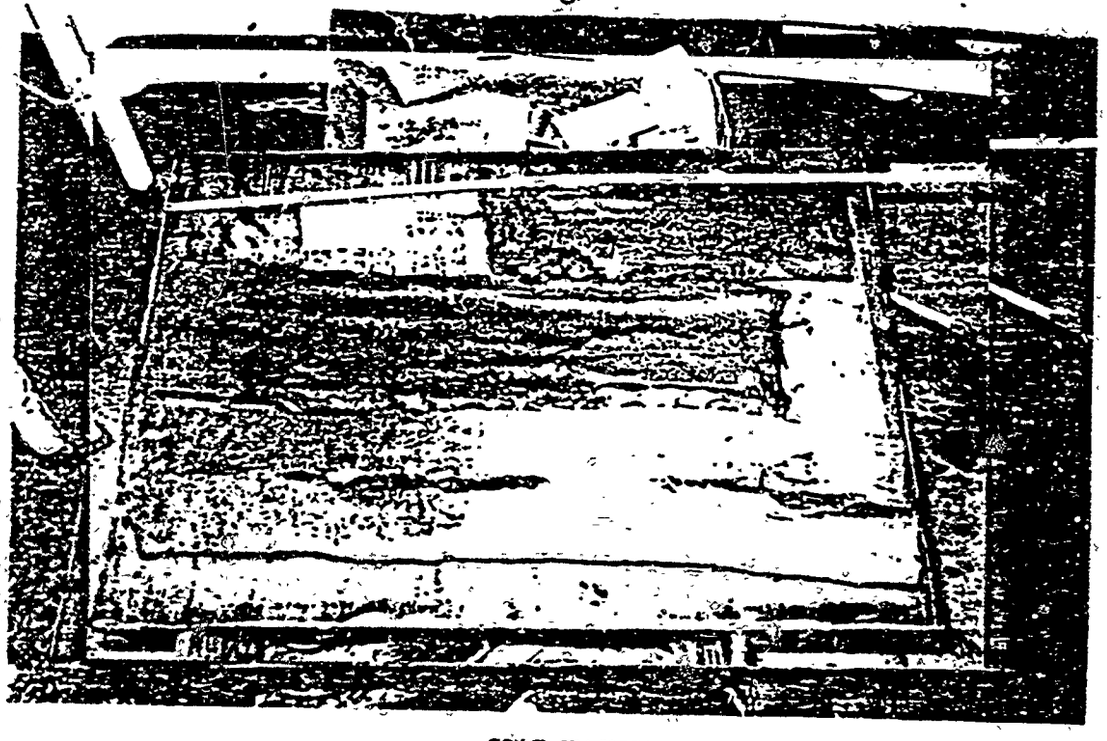
CORE TEN

0-36 Cm. Silt dark green, soft and loose
36-40 Shell hash, coarse
40-112 Silt, hard and dry, very small shell fragments
Torvane 40-112 Cm.
0.40 Kg/Cm^2 to 0.65 Kg/Cm^2



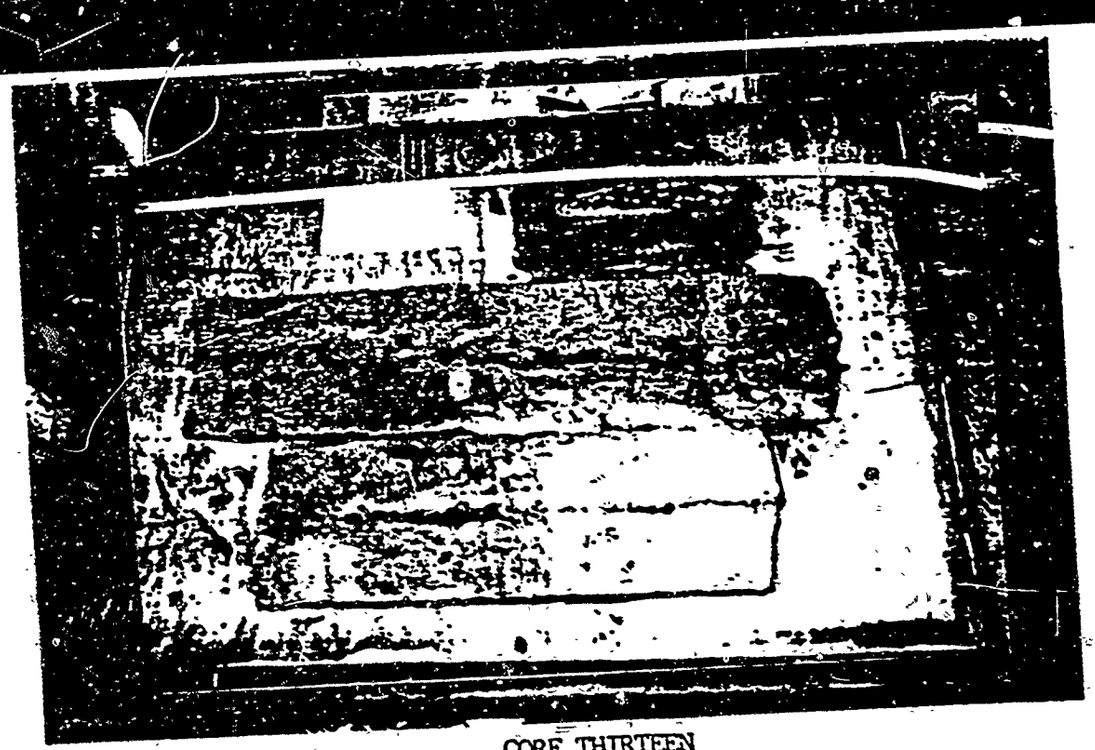
CORE ELEVEN

0-15 Cm. Silt, very soft, liquid; trace Sand, very fine
15-43 Sand, fine and Silt, dark green,
Trace Shell Fragments
Torvane less than 0.05 Kg/Cm^2



CORE TWELVE

0-80 Cm. Silt, dark green, soft
80-132 Silt, moderate plasticity, sticky
132-154 Silt, with fine sand lenses
Torvane 100 Cm. - 0.14 Kg/Cm^2
142 Cm. - 0.20 Kg/Cm^2

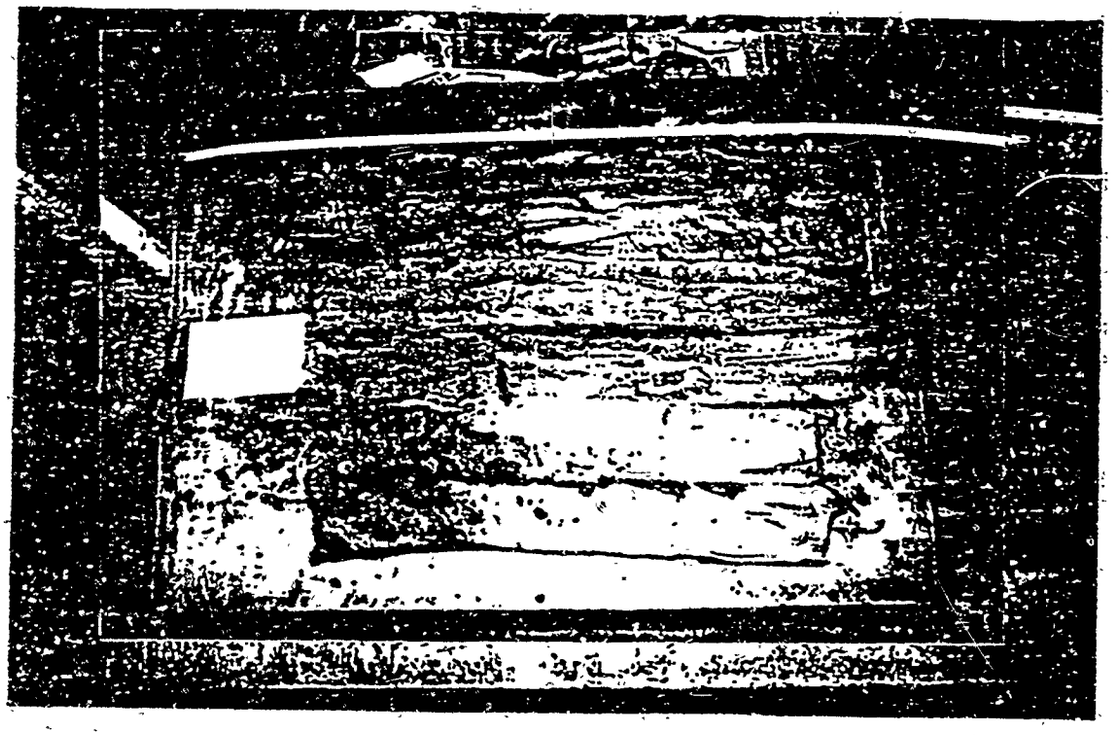


CORE THIRTEEN

0-20 Cm. Silt, soft, liquid
20-112 Silt, fine, dark green, plastic sticky
Torvane - 0-76 Cm. Less than 0.10 to 0.35 Kg/Cm^2

CORE FOURTEEN

0-60 Clay, dark green, very soft, plastic and sticky
60-76 Silt, dark green, with sand lenses
76-122 Clay, dark green, plastic sticky
Torvane 0-76 Cm.
Less than 0.05 Kg/Cm^2
76-122 Cm. 0.10 to 0.20 Kg/Cm^2



CORE FIFTEEN

0-116 Cm. Silt, very soft, sticky
116-210 Cm. Clay, very soft, plastic, sticky
Torvane 0.10 Kg/Cm^2 to 0.20 Kg/Cm^2

SEDIMENT SAMPLE SUMMARY CHART

Core #	Lat.	Long.	Sample Description
1	39° 00' 20"	123° 44' 25"	Two attempts, No recovery Probably dense hard Silt
2	39° 01' 10"	123° 45' 35"	0-50 Cm. Sand, very fine to Sandy Silt, dark green Trace Shell Fragments Torvane .08 Kg/cm^2 to .19 Kg/cm^2
3	39° 02' 40"	123° 47' 30"	0,48 Cm. Sandy Silt with finer softer, clayey lenses, trace molluscs Torvane .14 Kg/cm^2 to .19 Kg/cm^2
4	39° 03' 45"	123° 49' 02"	0.10 Cm. Silt, fine, dark green, very soft 10-48 Cm. Silt, fine, soft with Shell Fragments, dark dark green 48-86 Cm. Silt, fine dark green, Torvane 48-86 Cm. -0.30-0.35 Kg/cm^2
5	39° 04' 40"	123° 50' 20"	0-28 Silt, very fine, dark green very soft 28-104 Silt, very fine, dark green, Shell Fragments Torvane 51-104 Cm. 0.40 Kg/cm^2 to 0.56 Kg/cm^2
6	39° 05' 20"	123° 51' 43"	0-23 Cm. Silt, very soft 23-48 Silt, black to dark green, dense 48-76 Silt, dark green, very dense 76-86 Shell Hash Torvane 48-76 Cm. 0.25 Kg/cm^2 to 0.28 Kg/cm^2
7	39° 05' 38"	123° 52' 20"	0.47 Cm. Silt, dark green, soft 47-61 Coarse to fine Shell hash Torvane 0-47 0.10 Kg/cm^2 to 0.20 Kg/cm^2
8	39° 05' 50"	123° 52' 55"	0-46 Cm. Silt, dark green, soft 46-61 Silt, dark green, with Shell fragments, Shell hash lens at 46 Cm. Torvane - less than 0.05 Kg/cm^2

SEDIMENT SAMPLE SUMMARY CHART

Core #	Lat.	Long.	Sample Description
9	39° 05' 43"	123° 53' 25"	0-13 Cm. Silt, very soft, liquid 13-57 Silt, soft with shell layer at 57 cm. 57-134 Clay, dark green, very dense Torvane 57-134 Cm. greater than 1.0 Kg/cm^2 One full revolution of Torvane, and sediment still holding
10	39° 05' 23"	123° 54' 30"	0-36 Cm. Silt, dark green, soft and loose 36-40 Shell hash, coarse 40-112 Silt, hard and dry, very small Shell fragments Torvane 40-112 cm. 0.40 Kg/cm^2 to 0,65 Kg/cm^2
11	39° 04' 40"	123° 56' 20"	0-15 Cm. Silt, very soft, liquid trace Sand, very fine 15-43 Sand, fine and Silt, dark green, trace Shell fragments Torvane less than 0.05 Kg/cm^2
12	39° 03' 45"	123° 58' 20"	0-80 Cm. Silt, dark green, soft 80-132 Silt, moderate plasticity sticky 132-154 Silt, with fine sand lenses Torvane 100 cm. - 0.14 Kg/cm^2 142 cm. - 0.20 Kg/cm^2
13	39° 02' 55"	124° 00' 05"	0-20 Cm. Silt, soft, liquid 20-112 Silt, fine, dark green plastic sticky Torvane - 0-76 Cm. Less than 0.10 to 0.35 Kg/cm^2

SEDIMENT SAMPLE SUMMARY CHART

Core #	Lat.	Long.	Sample Description
14	39° 02' 50"	124° 02' 25"	0-60 Cm. Clay, dark green, very soft, plastic and sticky 60-76 Silt, dark green, with sand lenses 76-122 Clay, dark green, plastic sticky Torvane 0-76 cm/ Less than 0.05 Kg/cm^2 76-122 Cm. 0.10 to 0.20 Kg/cm^2
15	39° 02' 45"	124° 05' 15"	0-116 Cm. Silt, very soft, sticky 116-210 Clay, very soft, plastic, sticky Torvane 0.10 Kg/cm^2 to 0.20 Kg/cm^2

9/17/87 Addendum

Section 2C - GROUND BED SPECIFICATIONS

2C.1 GENERAL. This section covers installation of Owner-furnished grounding materials complete as specified herein and indicated on the following drawings.

WR 33733-1/3

WR 33733-2/3

WR 33733-3/3

2C.2 MATERIALS. All Owner-furnished grounding materials will be furnished new and undamaged in accordance with the following.

Cable	Okogard MV-90, 8 kV shielded power cable with one 6 AWG, 7 strand copper conductor, 0.115 inch EPR, 0.030 inch semiconducting EPR, 0.005 inch copper tape shield, 0.060 inch okolene high density polyethylene jacket, as manufactured by the Okonite Company, Ramsey, New Jersey
Anodes	Durichlor 51 Type E anode, equipped with 25 feet of 6 AWG, 7 strand HMPE, prepackaged in carbon backfill, as manufactured by the Duriron Company, Inc., Dayton, Ohio
Splices	Durco SK-40 splice kit, as manufactured by the Duriron Company, Inc., Dayton, Ohio

2C.3 INSTALLATION. Grounding materials shall be installed according to the drawings and requirements which follow.

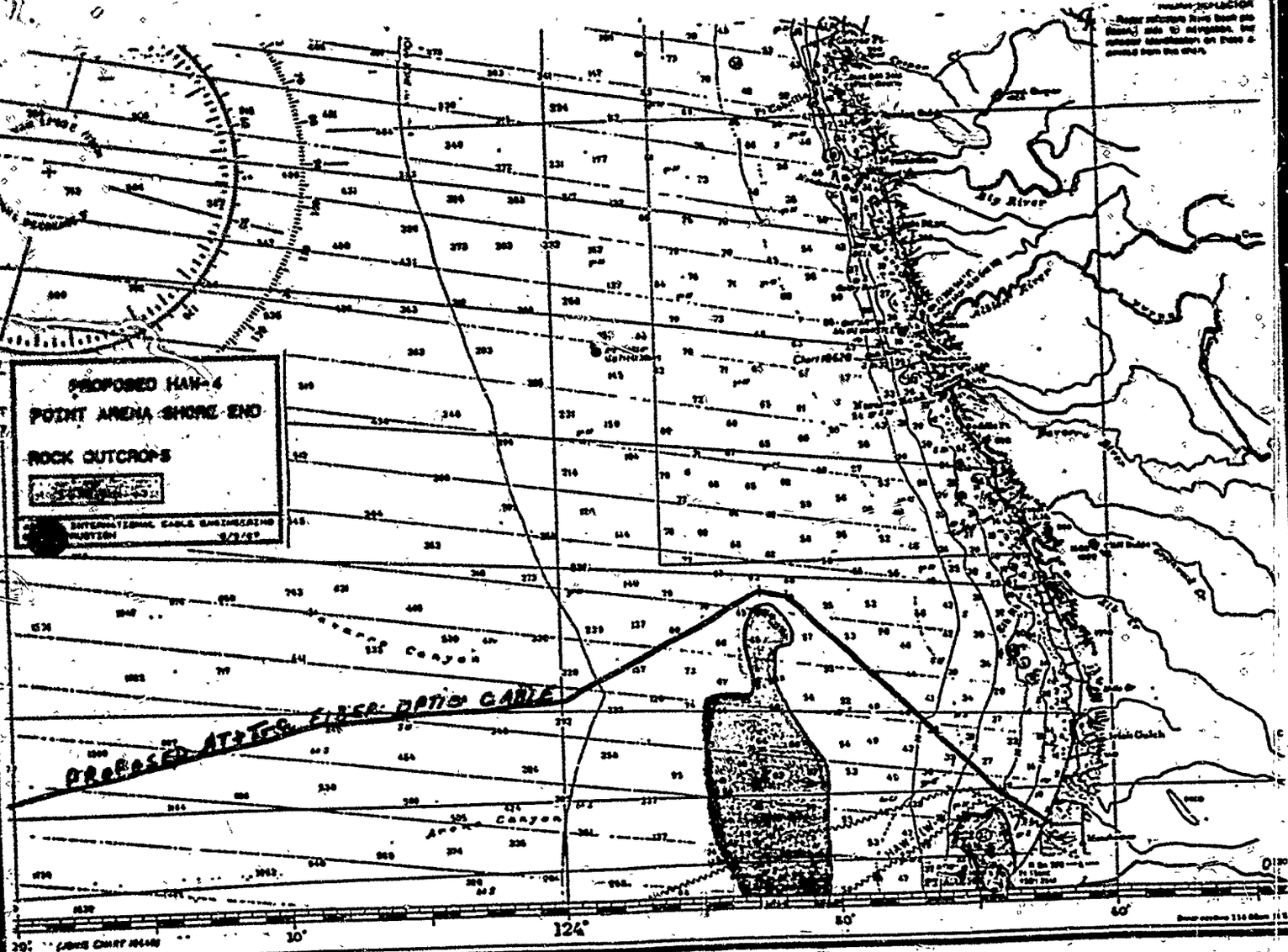
The ground bed anodes, with carbon backfill, shall be installed in drilled holes such that the bottom of the anodes extend a minimum of 1 foot below the mean low water level. Anodes shall be installed in groups of six, on 10 foot spacing as indicated on the drawings. Holes shall be backfilled with excavated material and compacted to a density not less than the surrounding natural material.

All splices will be made using the Durco SK-40 splice kit, following the manufacturer's instructions.

Resistance measurements shall be made between the ground bed and the ocean prior to and after each individual anode is connected to the ground cable. The ground bed resistance shall not exceed 1 ohm. Once a resistance of 1 ohm is achieved, the remaining anodes in that group of six anodes shall be installed, but additional groups of anodes need not be installed.

The ground cable shall be installed between the ground bed and the manhole at the communication facility and shall be brought into the manhole with 40 feet of spare cable in the manhole.

9/17/87 Addendum



(Pt. Arena to Trinidad Head)

LORAN-C

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