

LINDA CROCKETT LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

RECEIVED
LOYD P.C.W. LEE, P.E.
Engineering Division

DAVID WISSMAR, P.E.
Waste Division

BRIAN HASHIRO, P.E.
Highways Division

NOV 21 1995
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

November 16, 1995

Mr. Gary Gill
Director
STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 S. King Street, 4th Floor
Honolulu, HI 96813

SUBJECT: SOUTH KIHEI ROAD IMPROVEMENTS, PHASE II
WAIMAHAIHAI STREET TO WELAKAHAO ROAD
FEDERAL AID PROJECT NO. STP-3100(7)
FINAL ENVIRONMENTAL ASSESSMENT

Dear Mr. Gill:

Enclosed are four (4) copies of the Final EA and the completed OEQC Bulletin Publication form for the above subject project. The Department of Public Works and Waste Management, County of Maui, has reviewed the Final Environmental Assessment (EA). We have determined that the project will not have significant environmental effects and has issued a negative declaration. The comments received are included in the Final EA. Please publish the notice in the December 8, 1995 OEQC bulletin.

Please contact Mr. Joe Krueger of our Engineering Division at (808) 243-7745 if you have any questions.

Sincerely,

Charles Jencks
Director of Public Works & Waste Management

JK:mlk(ED95-1498)
G:\ENGL\ALL\SK2\EA-O.EQC

Enclosure

164

- 1995-12-08-MA-*FEA-South Kihei Road Improvement Phase II*
Waimahaihai Street to Welakahao Road DEC 8 1995

FILE COPY

Chapter 343, Hawaii Revised Statutes (HRS)

Final Environmental Assessment

SOUTH KIHAI ROAD IMPROVEMENTS - PHASE II

WAIMAHAIHAI STREET TO WELAKAHAO ROAD

KIHEI, MAUI, HAWAII

November 1995

For
Engineering Division
Department of Public Works and Waste Management
County of Maui

Prepared by:
Norman Saito Engineering Consultants, Inc.

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I. SUMMARY

**Chapter 343, Hawaii Revised Statutes (HRS)
Final Environmental Assessment
for
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road
Department of Public Works and Waste Management
County of Maui
November 1995**

APPLICANT: Department of Public Works and Waste Management
County of Maui
Wailuku, Maui, Hawaii

APPROVING AGENCY: Office of the Mayor
County of Maui

PROJECT NAME: South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

PROJECT LOCATION: Kihei, Maui, Hawaii
TMK: por. of 3-9

STATE LAND USE: Urban

**COUNTY COMMUNITY
PLAN DESIGNATION:** Single Family Residential/Business

COUNTY ZONING: R-3, B-2 - Makai of S. Kihei Rd.
R-2, B-2 - Mauka of S. Kihei Rd.

LANDOWNER: County of Maui

II. GENERAL DESCRIPTION OF THE ACTION'S CHARACTERISTICS

A. INTRODUCTION

Kihei is located on the south slopes of Haleakala on the island of Maui, Hawaii shown in Figure 1. The area has developed into a major residential/resort community. South Kihei Road is the major north-south collector street in the Kihei area. The road is a two lane heavily used road which has gradually become congested. The County of Maui is proposing road widening improvements to South Kihei Road between Waimahaihai Street and Welakahao Road to relieve traffic congestion in the area. The Project limits are shown in Figure 2. This Project is the second phase of South Kihei Road Improvements with the first phase of the South Kihei Road Improvements consisting of road widening from Auhana Road to Waimahaihai Street. This Project consists of widening South Kihei Road from the vicinity of Waimahaihai Street to Welakahao Road. The proposed improvements consist of pavement widening, adding curbs, gutters, bicycle lanes, sidewalks and a road side drainage system.

The proposed pavement widening improvements will initially allow for one lane of traffic in each direction, curb side parking, and a bike way. Left turn lanes are planned for minor intersecting street to alleviate traffic congestion.

This environmental assessment will provide the reviewer the opportunity to evaluate the potential impacts of implementing the proposed South Kihei Road Improvements.

B. TECHNICAL CHARACTERISTICS

This Project is a road widening project in the northerly direction from Waimahaihai Street to Welakahao Road by the Maui County Department of Public Works and Waste Management. Presently, South Kihei Road has two (2) travel lanes ten to eleven feet wide with a left turn lane in the southern direction at the intersection of Welakahao Road at the north end of the Project.

Road widening improvements are proposed on both sides of the existing South Kihei Road to obtain to a 70 foot right-of-way to allow for left turn lanes at all connector street intersections. Road widening land will have to be obtained from adjacent lands to obtain the desired right-of-way.

The roadway will be striped to include two (2) travel lanes, curb side parking, on the mauka side, left turn lanes at all street intersections and 5 foot wide bike lanes on each side. This striping is considered interim only, and will eventually be restriped to four (4) lane travel way in accordance with the Kihei Traffic Master Plan¹. Sidewalks will be installed on both sides of the roadway. A typical road section is shown in Figure 3. The curbs and gutters will be used to convey surface runoff from the roadway into new curb inlet catch basins.

Other incidental improvements involve the relocation of utility poles, signs, fire hydrants and water meters; removal of landscaping, barriers and walls; and the adjustment of manholes and valves.

C. SOCIO-ECONOMIC CHARACTERISTICS

1. Recreational Resources

There are two major recreational resources near the Project. Kalama Park, located less than 500 feet south of the South Kihei Road - Waimahaihai Street Intersection, provides ball-playing activities, picnicking and swimming. The Kihei coastline, accessible from Waimahaihai Street and Welakahao Road via public beach access, provides fishing, swimming and other beach activities.

2. Health Care

The nearest hospital, Maui Memorial Hospital, is located in Wailuku, approximately 10.5 miles north of the project. Medical offices and clinics are located throughout Kihei.

3. Police and Fire Protection

The County of Maui's Police Department is located in Kahului. Fire protection is by the Maui County Fire Department. The fire station is located at the south end of the project at the intersection of Waimahaihai Street and South Kihei Road.

¹Kihei Traffic Master Plan, Austin, Tsutsumi & Associates, Inc., October 1989.

4. Education

Kihei School and adjacent Lokelani Intermediate School, located on Lipoa Street approximately 3,500 feet from the project, educates students from kindergarten to 8th grade. Baldwin High School, located in Wailuku on Kaahumanu Avenue, provides education for students from grades 9 to 12. Maui Community College, located in Kahului, provides post-secondary education.

D. FUNDING AND PHASING

The project will be funded by the County of Maui and the Federal Highway Administration. Construction of the Project will be based upon a base bid and several additive bids which will allow the best use of the funding available. The estimated construction cost of all of the proposed improvements is: \$2,539,225.00.

III. THE AFFECTED ENVIRONMENT

A. GEOGRAPHICAL CHARACTERISTICS

The project site is located on the southern slopes of Haleakala Mountain within the town of Kihei on the island of Maui. The Project area has an average elevation between 5 feet and 9.5 feet mean sea level (MSL). Mean annual rainfall amounts to 10 inches.

The soil found in the area is classified as Jaucas sand (JaC), according to the "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii" produced in 1972 by the U.S. Department of Agriculture, Soil Conservation Service. Jaucas sand is derived from coral and shells which have been wind or water deposited and are found along the coast on slopes from 0 to 15 percent. The surface layer of the soil can be dark brown as a result of accumulation of organic matter and alluvium. Permeability is rapid and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion is a severe hazard where vegetation has been removed. The soil is used typically for pasture, sugarcane, truck crops, and urban development.

B. BIOLOGICAL CHARACTERISTICS

There are no endangered species of flora or fauna within the proposed project boundaries. The project consists of widening an existing roadway which road shoulders consisting of mainly bare soil. Adjacent properties have mostly residential and commercial lands with exotic or introduced species of flora including (but not limited to) Oleander (*Nerium indicum*), African Tulip (*Spathodea companulata*), Plumeria, Golden Shower (*Cassia fistula*), Kiawe (*Prosopis pallida*), Ironwood (*Casuarina* spp.), Italian Cyprus (*Cupressus sempervirens*), Bougainvillea and various grasses. The only native species observed was the coconut tree which is not an endangered species. See Appendix A for the flora and fauna assessment.

C. HYDROLOGICAL CHARACTERISTICS

From the Flood Insurance Rate Map, September, 1989, the Flood Hazard Zone designation is "AO", (Depth 1') and "AH" (Elev. 7). A preliminary drainage report for the Project is attached in Appendix B. The proposed project consists of road widening. No habitable structures are proposed.

D. SERVICE FACILITIES

By the nature of the Project, there will be no demand for the typical urban services, i.e. water, sewer, police, fire protection, schools, parks, or utilities. The Project will improve the present road system by striping traffic lanes and creating left turn lanes into minor streets to provide increased vehicular capacity. The improvements will provide better access for emergency vehicles. Paved bikeways will also be constructed for safer vehicular, bicycle and pedestrian movement.

E. ARCHEOLOGICAL SITES

There are no significant historic sites in the area recorded by the State Historic Preservation Office. In the event that the trenching for the placement of the storm drain lines reveal any site or artifacts, the Historic Preservation Division District archaeologist will be notified and all construction work will be halted until a determination has been made of the site's value.

F. AESTHETICS AND VISUAL CHARACTERISTICS

Presently, the shoulders of South Kihei Road are relatively bare of grass and landscaping. Providing curbs should allow grass to be established and afford street landscaping thereby improving aesthetics along the road way. The project is to widen the existing roadway and will not change the visual and aesthetic character of the area.

G. RELATIONSHIP TO EXISTING LAND USE, POLICIES, PLANS AND CONTROLS

The project is located in state urban designated lands. The Kihei-Makena Community Plan designates the land use as residential with the south end of the project designated as business. The Project is a road widening project and is in conformance with the existing land use policies of the County of Maui.

IV. SUMMARY OF MAJOR IMPACTS AND MITIGATION MEASURES

A. SHORT TERM IMPACTS

There will be an increase in airborne and noise emission levels during construction. The effect of noise will be mitigated by ensuring compliance with the provisions of all applicable State Department of Health noise standards. Other mitigating measures shall include restricting the hours of operation, minimizing the use of heavy vehicles beyond the project limits (side streets) and requiring that all construction equipment and vehicles be equipped with mufflers. A noise survey was performed for this project and attached in Appendix C.

Soil loss for this area has been estimated by the Universal Soil Loss Equation (HESL) in accordance with the County of Maui Grading Ordinance concerning soil erosion and sedimentation control. Normal erosion and dust control measures include dust control by sprinkling with sprinklers/water wagons as necessary. Grassing shall take place immediately after shoulders are prepared for planting. A drainage report is attached in Appendix B.

In the event that archeological remains are uncovered, all construction work will cease and the State Historic Preservation Office will be notified. There are no known endangered species of animal or plants within the project limits.

B. LONG TERM IMPACTS

It will be necessary to acquire some of the adjacent lands to increase the right-of-way and widen the pavement. Mitigative measures include minimizing the amount of land to be obtained for the project and compensating the landowners for the land lost.

The proposed project shall be beneficial to all vehicular and pedestrian traffic. Emergency ambulance, police and fire protection services shall also be provided improved access through the area.

V. ALTERNATIVES CONSIDERED

No other alternative was considered. The usage of the existing South Kihei Road has made it necessary for the road improvements to proceed.

VI. DETERMINATION, FINDINGS AND REASONS SUPPORTING DETERMINATION

The South Kihei area is continually growing and as a result automobile traffic is becoming more congested. In addition, the increase in pedestrian and bicycle traffic require measures for the efficient flow of traffic and for the improvement of the safety of these people that share the same travel route but are not driving autos. South Kihei Road shall continue to be a main collector road. The improvements are necessary to provide the level of service so dictated by the usage of this county road.

VII. LIST OF PREPARERS

Norman Saito Engineering Consultants, Inc.

Eric K. Nishibayashi (Flora and Fuana Assessment)

Y. Ebisu and Associates (Noise Survey)

VIII. AGENCIES CONSULTED AND RESPONSES

1. County of Maui
 - A. Department of Water Supply
 - B. Planning Department
 - C. Engineering Division
 - D. Wastewater Reclamation Division
2. Department of Transportation
Highways Division
State of Hawaii
3. Department of the Army
U.S. Army Engineering District
Regulatory Branch
4. Clean Water Branch
Department of Health
State of Hawaii
5. Department of Business, Economic Development, and Tourism
Land Use Commission
State of Hawaii
6. Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
7. Natural Resources Conservation Services
U.S. Department of the Interior
8. Department of Land and Natural Resources
State of Hawaii
9. Fish and Wildlife Service
U.S. Department of the Interior
10. University of Hawaii
Environmental Center
11. Office of Environmental Quality Control
State of Hawaii

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Mr. Charles Jencks, Director
Department of Public Works and Waste Management
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

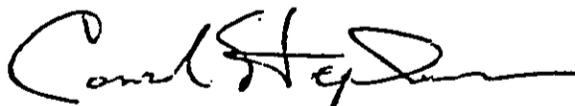
Dear Mr. Jencks:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

LINDA CROCKETT LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
LAND USE AND CODES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

September 15, 1995

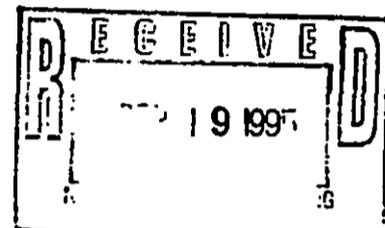
RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

DAVID WISSMAR, P.E.
Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Divisions



Mr. Conrad Stephenson
NORMAN SAITO ENGINEERING CONSULTANTS, INC.
2158 Main Street
Wailuku, Hawaii 96793

SUBJECT: Draft Environmental Assessment
SOUTH KIHEI ROAD IMPROVEMENTS - PHASE II
TMK: (2)3-9 por.

Dear Mr. Stephenson:

We reviewed the subject draft environmental assessment and have the following comments:

1. Comments from the Engineering Division:

This division has reviewed this submittal and has no comments at this time.

2. Comments from the Solid Waste Division:

- a. Contact the Central Maui Sanitary Landfill Operations Supervisor at 877-7596 or 877-5319 for instructions on the disposal of clearing and grubbing material and any excavated material that is scheduled for disposal.

The applicant is requested to contact the Solid Waste Division at 243-7875 for additional information.

3. Comments from the Wastewater Reclamation Division:

- a. Gravity sewer lines, forcemain and pump station site all exist in project location. Design of drainage improvements and road widening should take these into account.

The applicant is requested to contact the Wastewater Reclamation Division at 243-7417 for additional information.

Mr. Conrad Stephenson
Page 2 of 2
September 15, 1995

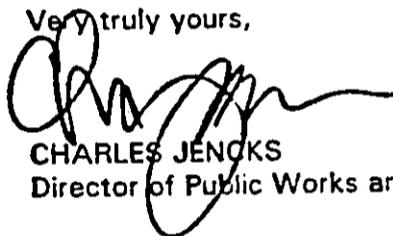
4. Comments from the Land Use and Codes Administration:

- a. The invert for the drainage system's outfall is proposed at .01 feet msl. Based on the existing drainage outfall in the area, the proposed outfall may be perennially blocked. Special outfall designs should be looked at in order to maintain the performance of the proposed system. Kaanapali Resort's ocean outfall may be a design to be considered.

The applicant is requested to contact the Land Use and Codes Administration at 243-7373 for additional information.

If you have any questions regarding this letter, please call me at 243-7845.

Very truly yours,



CHARLES JENCKS
Director of Public Works and Waste Management

ey
xc: Engineering Division
Solid Waste Division
Wastewater Reclamation Division
g:\ucal\hczm\skihrd.daa

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Mr. David Blane, Director
Planning Department
County of Maui
250 South High Street
Wailuku, Maui, Hawaii 96793

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Mr. Blane:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

LINDA CROCKETT LINGLE
Mayor

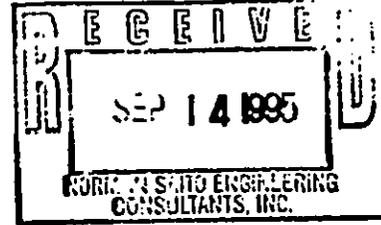


DAVID W. BLANE
Director

GWEN OHASHI MURAGA
Deputy Director

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

September 7, 1995



Mr. Conrad Stephenson
Project Engineer
Norman Saito Engineering Consultants Inc.
Wailuku Townhouse
Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Stephenson:

RE: Draft Environmental Assessment (EA) South Kihei Road
Improvements - Phase II Waimahaihai Street to Welakahao
Road

We have reviewed the Draft Environmental Assessment for the subject project and offer the following comments:

1. The proposed project will require an SMA permit. A timely application will aid in preventing possible delays.
2. Section IV, Summary of Major Impacts and Mitigation Measures, should consider that the physical construction occur during a period of normally low visitor counts.
3. The proposed drainage outlet, at the makai end of Welakahao Street, should be constructed in such a manner as to not restrict the existing beach access.

Should you need additional information on this subject, please contact Don Schneider of this office at 243-7735.

Very truly yours,

Handwritten signature of David W. Blane in cursive.
DAVID W. BLANE
Director of Planning

DWB:ds
cc:Colleen Suyama
Don Schneider
Project File
(J:kbc:EA.p1)



August 14, 1995

Lt. Colonel Elliott
Pacific Ocean Division
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858

**RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road**

Dear Lt. Colonel Elliott:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

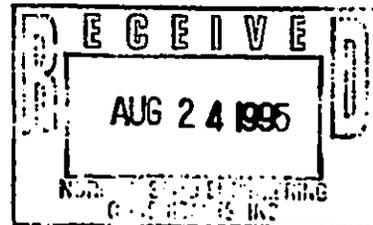


DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

August 22, 1995

Planning Division



Mr. Conrad Stephenson
Project Engineer
Norman Saito Engineering Consultants, Inc.
2158 Main Street, Suite 203
Wailuku, Hawaii 96793

Dear Mr. Stephenson:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (EA) for the South Kihei Road Improvements Project Phase II, Kihei, Maui. The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. The DA permit information provided to you by letter dated May 31, 1995 remains unchanged (NP95-078).

b. The flood hazard information presented on page 5 of the EA is correct.

Sincerely,

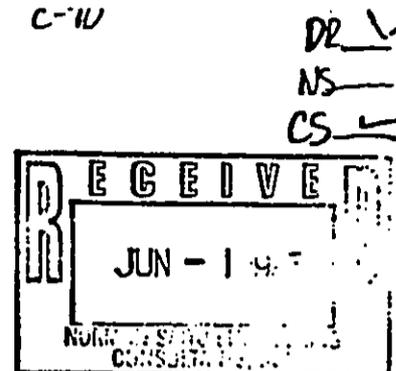
Ray H. Jyo, P.E.
Director of Engineering



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

May 31, 1995



Regulatory Branch

SUBJECT: Storm Drainage, Kihei, Maui, TMK: 3-9-02, File Number
NP 95-078

Mr. Conrad Stephenson
Project Engineer
Norman Saito Engineering
Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

Dear Mr. Stephenson:

This letter is regarding your proposed drainage project along South Kihei Road and Welakahao Road, as shown on the attached map. Based on photos provided by you, a Department of the Army (DA) permit will not be required as long as the outlet structure stays above the Ordinary High Tide Line (OHTL), as determined in the attached photo xerox, where the physical markings of the OHTL include the line of fine shell or debris on the high side of the berm.

This project has been assigned file number NP 95-078. Please refer to this number in any future correspondence. If you have any questions or need further information, please call me at 438-9258, extension 13, or Ms. Tomoyasu at extension 20.

Sincerely,

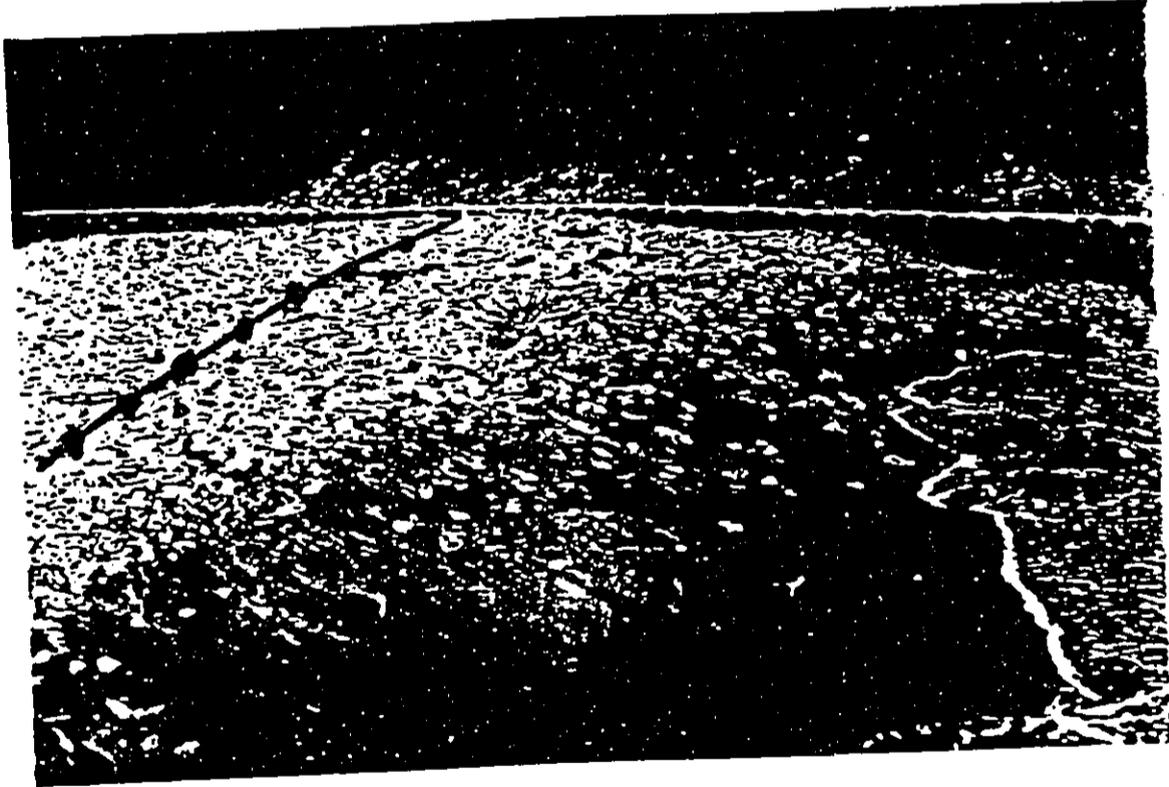
Terrell E. Kelley
Team Leader, Maui, Molokai
Lanai, and Kauai

Attachments

Copies Furnished:

State Department of Health, Clean Water Branch, Honolulu, HI
Maul County Department of Public Works, HI
Maul County Department of Planning, HI

DOCUMENT CAPTURED AS RECEIVED



State of Hawaii
Regulation
Reservoir

Proposed
Outlet

O C E A N



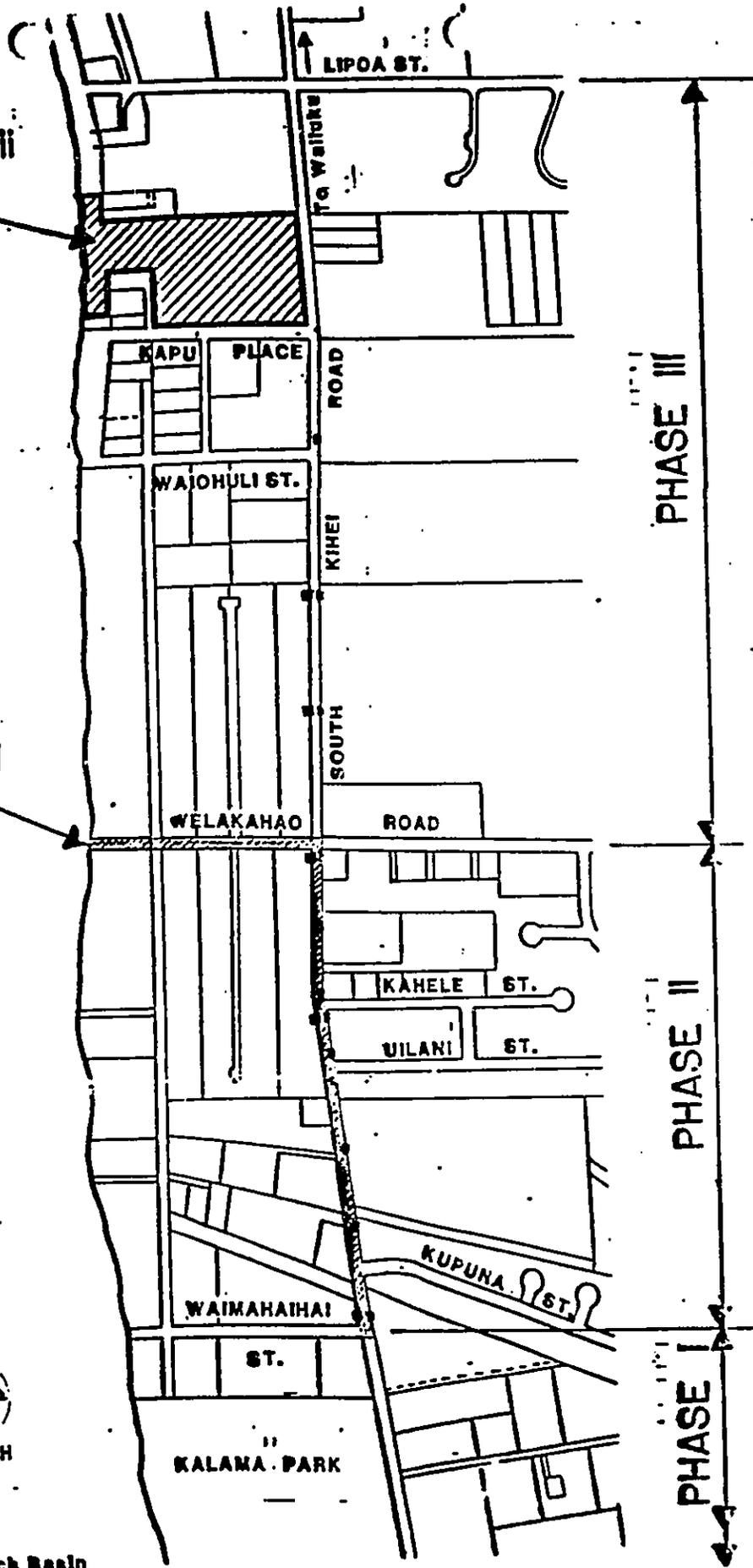
NORTH

LEGEND :

■ Catch Basin

800 800 0 800

3-9-02:



NP 95-07

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Mr. Dennis Lau, Chief
State Department of Health
Environmental Management Division
Clean Water Branch
919 Ala Moana Blvd.
Honolulu, Hawaii 96814

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

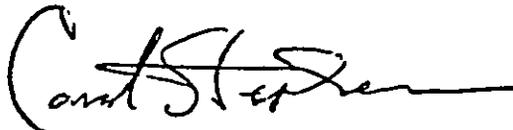
Dear Mr. Lau:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

BENJAMIN J. CAYetano
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

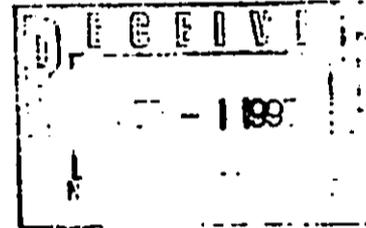
LAWRENCE BRICE
DIRECTOR OF HEALTH

In reply, please refer to:
EMD/CWB

August 28, 1995

P0835HC

Mr. Conrad Stephenson, Project Engineer
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Maui, Hawaii 96793



Dear Mr. Stephenson:

Subject: South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road Project
Kihei, Maui, Hawaii

The Department of Health acknowledges the receipt of your letter and Draft Environmental Assessment (EA) for the South Kihei Road Improvements - Phase II, Waimahaihai Street to Welakahao Road Project, Kihei, Maui, Hawaii (TMKs: 3-9-02), and has the following comments:

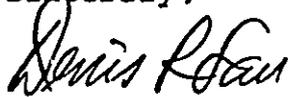
1. The applicant should contact the Army Corps of Engineers (COE) to identify whether a Federal permit (including a Department of Army (DA) permit) is required for this project. A Section 401 Water Quality Certification (WQC) is required for "Any applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..." pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act (CWA)").
2. If the project involves the following activities with discharges into State waters, an NPDES general permit is required for each activity:
 - a. Discharge of storm water runoff associated with construction activities, including clearing, grading, and excavation that result in the disturbance of equal to or greater than five (5) acres of total land area;

Mr. Conrad Stephenson
August 28, 1995
Page 2

- b. Construction dewatering effluent;
 - c. Non-contact cooling water;
 - d. Hydrotesting water; and
 - e. Treated contaminated groundwater from underground storage tank remedial activity.
3. If there is any type of process wastewater discharge from the facility into State waters, the applicant may be required to apply for an Individual NPDES permit.

Should you have any further questions regarding this matter, please contact Ms. Hong Chen, Engineering Section of the Clean Water Branch, at (808)586-4309 or toll free at 1-800-468-4644, ext. 64309.

Sincerely,



DENIS R. LAU, P.E., CHIEF
Clean Water Branch

HC/sl

c: DHSA, Maui

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Executive Officer
State Land Use Commission
Department of Business, Economic Development, and Tourism
335 Merchant Street, Rm 104
Honolulu, Hawaii 96813

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

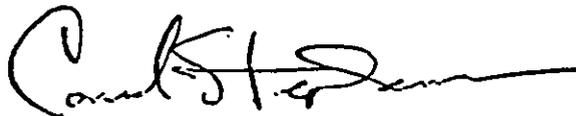
Dear Sir:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

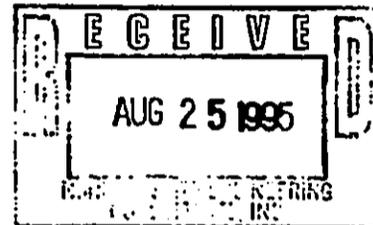
WAILUKU TOWNHOUSE • SUITE 203 • 2158 MAIN STREET • WAILUKU, MAUI, HAWAII 96793 • TELEPHONE 242-7400

BENJAMIN J. CAYZANO
GOVERNOR



ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
Room 104, Old Federal Building
335 Merchant Street
Honolulu, Hawaii 96813
Telephone: 587-3822
August 24, 1995



Mr. Conrad Stephenson
Project Engineer
Norman Saito Engineering
Consultants, Inc.
Wailuku Townhouse
2158 Main Street, Suite 203
Wailuku, Hawaii 96793

Dear Mr. Stephenson:

**Subject: Draft Environmental Assessment (EA) for the South
Kihei Road Improvements - Phase II, Waimahaihai
Street to Welakahao Road**

We have reviewed the subject draft EA received with your letter dated August 14, 1995, and confirm that the project site as shown on figure 2 appears to be located within the State Land Use Urban District.

We have no other comments to offer.

Should you have any questions, please feel free to call me or Kathy Yonamine of our office at 587-3822.

Sincerely,

A handwritten signature in cursive script, appearing to read "Esther Ueda".

ESTHER UEDA
Executive Officer

EU:KY:th



August 14, 1995

Administrator
Historic Preservation Office
Department of Land and Natural Resources
33 South King Street, 6th floor
Honolulu, Hawaii 96813

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Sir:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.

Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER II

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND

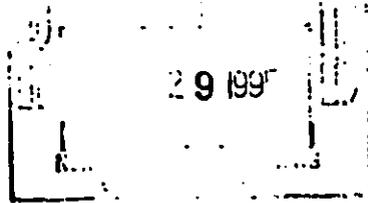
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION

DIVISION
LAND MANAGEMENT

STATE PARKS
WATER AND LAND DEVELOPMENT

September 26, 1995



Mr. Conrad Stephenson, Project Engineer
Norm Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

LOG NO: 15317 ✓
DOC NO: 9509SC22

Dear Mr. Stephenson:

SUBJECT: Historic Preservation Review of the Proposed South Kihei
Road Improvements, Phase II - Waimahaihai Street to
Welakahao Road
Keokea, Wailuku District, Maui TMK: Por. of 3-9

Thank you for the opportunity to comment on the proposed improvements to a section of South Kihei Road between Waimahaihai Street and Welakahau Road in Kihei, Maui. Proposed work includes: pavement widening; the addition of curbs, gutters, bicycle lanes, and sidewalks; and the installation of a roadside drainage system. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the subject parcel.

A number of archaeological inventory surveys, including both surface and sub-surface investigations, have been conducted in the immediate vicinity of the proposed project area (Archaeological Inventory Report for TMK 3-9-02:14, Located at Kihei, Island of Maui. 1991. Maigret & Kennedy; An Archaeological Inventory Survey of Parcel TMK 3-9-10:77, Town of Kihei, Keokea Ahupua'a, Wailuku District, Island of Maui. 1992. Spear; Archaeological Inventory Survey on Smith Trust Property (Kihei) in Waiohuli Ahupua'a, Wailuku District, Maui Island. 1994. W. Fredericksen, et al.). In addition, a number of inventory surveys and archaeological monitoring projects have been conducted along both sides of Kihei Road, to the north and south of the current project area.

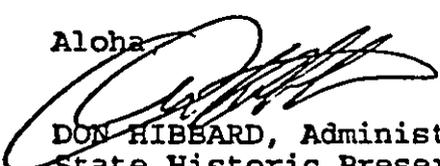
Mr. Conrad Stephenson
Page 2

The surface and subsurface surveys conducted in the vicinity of the proposed project area did not locate any evidence of surface features or subsurface deposits that are of historic or cultural significance. Given these findings, it seems unlikely that significant historic sites are within the proposed project area. Therefore, we believe that this project will have "no effect" on historic sites.

Should historic sites such as walls, platforms, pavements, or mounds, or remains such as artifacts, burials, concentrations of shell or charcoal be encountered during construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division (587-0013), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha



DON HIBBARD, Administrator
State Historic Preservation Division

SC:jen

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Director
Soil Conservation Service
Department of Agriculture
P.O. Box 50004
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

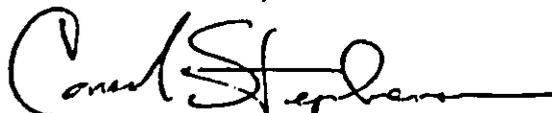
Dear Sir:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure



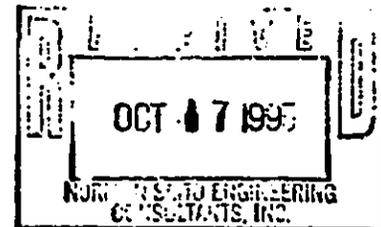
United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

October 13, 1995

Conrad Stephenson
Norman Saito Engineering Consultants, Inc.
2158 Main St., Suite 203
Wailuku, HI 96793



Dear Mr. Stephenson:

Subject: Draft Environment Assessment - South Kehei Road
Improvements - Phase II

We have reviewed the Draft Environmental Assessment for the South Kehei Road
Improvements - Phase II and have no comments to make at this time.

Thank you for the opportunity to review the DEA for the Kehei Road Improvements
- Phase II.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc: Mike Bajinting, DC, Honolulu F.O.

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Director
Commission on Water Resources Management
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Sir:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

BENJAMIN J. CAYETANO
Governor of Hawaii



Chairperson
MICHAEL D. WILSON
Board of Land and Natural Resources

Deputy Director
GILBERT COLOMA-AGARAN

REF:OCEA:TES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. Box 621
Honolulu, Hawaii 96809

Aquaculture Development
Aquatic Resources
Boating and Ocean Recreation
Bureau of Conveyances
Conservation and Environmental Affairs
Conservation and Resources Enforcement
Forestry and Wildlife
Historic Preservation
Land Management
State Parks
Water and Land Development

OCT 5 1995

File No.: 96-085

Mr. Conrad Stephensen
Norman Saito Engineering Consultants, Inc.
2158 Main Street, Wailuku Townhouse, Suite 203
Wailuku, Maui, Hawaii 96793

OCT - 6 1995

Dear Mr. Stephensen:

Subject: Draft Environmental Assessment (EA) for the South Kihei
Road Improvements - Phase II, Waimahaihai Street to
Welakahao Road

Thank you for giving our Department the opportunity to comment on
this matter. We have reviewed the materials you submitted and
have the following comments.

Division of Aquatic Resources:

According to DAR, significant impacts adverse to aquatic
resources are not expected from the activities proposed.
However, DAR suggest that construction activities be restricted
to periods of minimal rainfall and areas denuded of vegetation
which could be susceptible to wind or water erosion are
appropriately stabilized. Further, precautionary measures should
be taken to prevent construction materials, petroleum products,
debris and especially eroded soils from entering coastal waters.

Commission on Water Resource Management:

CWRM strongly promotes the efficient use of our water resources
through water conservation measures and use of alternative non-
potable water resources whenever available, feasible, and if
there are no harmful effects to ecosystems. Also, CWRM
encourages the protection of water recharge areas which are
important for the maintenance of streams and the replenishment of
aquifers.

We are concerned about the potential for ground or surface water
contamination/degradation and recommend that approvals for this
project be conditioned upon a review by the State Department of
Health and the developer's acceptance of any resulting
requirements related to water quality.

Mr. C. Stephensen

-2-

File No.: 96-085

Also, based on the information provided, it does not appear that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can proceed.

In addition, our Department's Historic Preservation Division has responded in a separate letter.

We have no other comments at this time. Should you have any questions, please call Sam Lemmo at the Office of Conservation and Environmental Affairs at 587-0377.

Aloha,

Michael D. Wilson
f MICHAEL D. WILSON

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Director
Fish and Wildlife Service
Department of the Interior
P.O. Box 50156
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Sir:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

Response from Karen Evans, Fish and Wildlife Service, Department of the Interior

Verbal on 10/13/95

No comments on Project. Will not be sending a written response.

NS / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Dr. John Harrison, Environmental Coordinator
University of Hawaii
Environmental Center
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Dr. Harrison:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

WAILUKU TOWNHOUSE • SUITE 203 • 2158 MAIN STREET • WAILUKU, MAUI, HAWAII 96793 • TELEPHONE 242-7400

Response from Dr. John Harrison, University of Hawaii

Verbal on 10/11/95

No comments on Project. Will not be sending a written response.

LINDA CROCKETT LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

DAVID WISSMAR, P.E.
Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Division

August 14, 1995

OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

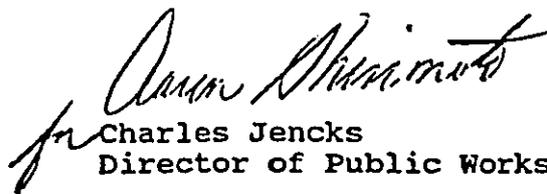
Subject: Draft Environmental Assessment for
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Sir,

The County of Maui Department of Public Works and Waste Management has reviewed the draft Environmental Assessment for the project and anticipates a negative declaration determination. Please publish the notice and availability for comments for this project in the September 8, 1995 OEQC Bulletin.

Enclosed are four (4) copies of the draft EA and the completed OEQC Bulletin Publication form. Please contact Mr. Joe Krueger, Engineering Division, County of Maui, at 243-7434, if you should have any questions.

Sincerely,


Charles Jencks
Director of Public Works and Waste Management

CJ;cs

Enclosures

W / NORMAN SAITO ENGINEERING CONSULTANTS, INC.
civil · structural · surveying

August 14, 1995

Mr. Gary Gill, Director
Office of Environmental Quality Control
220 South King Street, 8th Floor
Honolulu, Hawaii 96813

RE: Draft Environmental Assessment (EA)
South Kihei Road Improvements - Phase II
Waimahaihai Street to Welakahao Road

Dear Mr. Gill:

Enclosed is a copy of the Draft Environmental Assessment Report for the South Kihei Road Improvements - Phase II, Kihei, Maui, Hawaii. Please review and forward your response. This draft EA has been submitted to the Office of Environmental Quality Control for publication in the September 8, 1995 bulletin.

We look forward to receiving your comments. The thirty day review period shall end on October 9, 1995. Thank you for your attention to this project.

Sincerely,

Norman Saito Engineering
Consultants, Inc.



Conrad Stephenson
Project Engineer

xc: OEQC
Mr. Joe Krueger, Engineering Division
Department of Public Works
County of Maui

Enclosure

1338

BENJAMIN J. CAYETANO
GOVERNOR



122

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COUNTY OF MAUI
PUBLIC WORKS

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-2442

October 2, 1995

DEPT. OF	
PUBLIC WORKS	
MANAGEMENT	
DIRECTOR	
ASST. DIR.	
PLANNING	
ENGR'G	
ENV. MGMT.	
INSPECTION	
LEGAL	
PLANNING	
TRAINING	
ADMIN.	
RECORDS	
COMM. REL.	
SALES	
SECURITY	

Re: ...
By: Asst. Dir. 10/2/95

Mr. Charles Jencks, Director
Department of Public Works and Waste Management
200 South High Street
Wailuku, Hawaii 96793

Subject: Draft Environmental Assessment for South Kihei Road
Improvements - Phase II, Waimahaihai to Welakahao

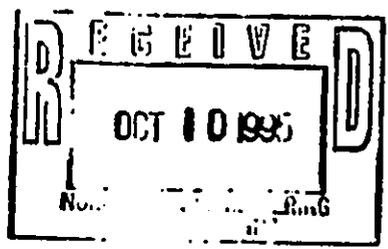
Thank you for the opportunity to review the subject document. We
have the following comments.

1. The Department of Public Works and Waste Management proposes to acquire land from abutting landowners to complete this project. Please consult with the affected landowners and address their concerns in the final environmental assessment.
2. Please provide a listing of the land uses abutting the roadway that is being improved.
3. Will there be reduced parking for recreational users of the nearby beaches as a result of this project? If so, what are the impacts associated with the reduced parking?
4. This project should consider mitigation measures to control run-off which may contribute to non-point source pollution to the nearby ocean.
5. Improvements to this roadway will cause an increase in traffic. What is the expected increase in traffic volume after the improvements are complete? What are the impacts associated with the increase in traffic?

If you have any questions, please call Jeyan Thisayan at
586-4185. Mahalo.

Sincerely,

Gary Gill
Director



RECEIVED
OCT 10 1995
COUNTY OF MAUI
ENGINEERING DIVISION
DEPT. OF PUBLIC WORKS

LINDA CROCKETT LINGLE
Mayor

CHARLES JENCKS
Director

DAVID C. GOODE
Deputy Director

AARON SHINMOTO, P.E.
Chief Staff Engineer



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
AND WASTE MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Land Use and Codes Administration

EASSIE MILLER, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

DAVID WISSMAR, P.E.
Solid Waste Division

BRIAN HASHIRO, P.E.
Highways Division

October 26, 1995

Mr. Gary Gill
Director
STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 S. King Street, 4th Floor
Honolulu, HI 96813

SUBJECT: SOUTH KIHAI ROAD IMPROVEMENTS, PHASE II
WAIMAHAIHAI STREET TO WELAKAHAO ROAD
FEDERAL AID PROJECT NO. STP-3100(7)
DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Gill:

This letter is in response to your comments dated October 2, 1995 to the above mentioned project. The following addresses your concerns:

1. LAND ACQUISITION FROM OWNERS OF THE ABUTTING PROPERTY ALONG SOUTH KIHAI ROAD AND THEIR CONCERNS

In order to achieve the objectives of the project, land must be acquired on both sides of the present right-of-way. The existing ROW will increase from 56' to 70'. The firm of ACM, Real Estate Appraisers, Inc. of Wailuku, Maui, Hawaii, has been hired to appraise the value of the land needed from each parcel. Approximately 7' will be obtained from each side. The land owners shall be consulted during the on-site visit by the representatives of the appraisal company and Norman Saito Engineering Consultants, the County's consultant for the above project. Improvements by the owners which are located on the road widening strip to be obtained by the County will be relocated at the County's expense and to the approval of the landowner. The concerns expressed by the owners will be included in the final environmental assessment.

2. LIST OF LAND USES ABUTTING THE ROADWAY

The State land use is urban. The Community Plan Designation is Single Family Residential and Business. The zoning is R-3, R-2 and B-2. At the south end of the project is Kukui Mall and a garden center. At the north end is a County wastewater pump station and the Baptist Church. In between are single family residences.

Mr. Gary Gill

**SUBJECT: SOUTH KIHAI ROAD IMPROVEMENTS, PHASE II
WAIMAHAIHAI STREET TO WELAKAHAO ROAD
FEDERAL AID PROJECT NO. STP-3100(7)
DRAFT ENVIRONMENTAL ASSESSMENT**

October 26, 1995

Page 2

3. WILL THERE BE REDUCED PARKING AS A RESULT OF THE PROJECT?

At present, there is no parking along the shoulders of the road within the project limits. After completion of the project there will be thirty-four (34) striped stalls for parallel parking on the makai side of the road.

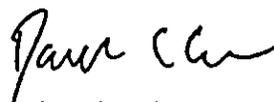
4. CONSIDERATION OF MITIGATION MEASURES TO CONTROL RUN-OFF WHICH MAY CONTRIBUTE TO NON-POINT SOURCE POLLUTION TO THE NEARBY OCEAN

During construction, mitigation measures include erosion control measures such as watering to keep dust down and grassing the areas to be planted immediately after final grading. After completion of the project, a drainage system comprised of catch basins and underground pipes shall collect the run-off from the road and discharge it through a beach access route at Welakahao Road.

5. IMPROVEMENTS TO THE ROAD WILL CAUSE AN INCREASE IN TRAFFIC. WHAT ARE THE IMPACTS OF THE INCREASE?

There are only two (2) continuous north-south routes for the Kihei region; Kihei Road and Pi'ilani Highway. For short distances within Kihei, Kihei Road is used. Pi'ilani Highway is used more for travel leaving and entering the region altogether. The improvements will not have any effect on the amount of traffic on the road. The improvements are meant to relieve the existing congestion, provide better access to emergency vehicles and to provide smoother and safer transportation routes for automobiles, bicycles and pedestrians.

Sincerely,



For Charles Jencks
Director of Public Works & Waste Management

JK:mlk(ED95-1497)
G:\ENGL\ALL\SK2DEA-O.EQC

Enclosure: Letter from OEQC

cc: Norman Saito Engineering Consultants, Inc.

IX. PERMITS REQUIRED

- A. Special Management Area Use Permit (SMA)
(County of Maui, Planning Department)**
- B. NPDES - Construction Dewatering Permit
(DOH, Clean Water Branch)**
- C. Permit to perform work in Right-of-Way
(Department of Public Works)**

APPENDIX "A"

FLORA AND FAUNA ASSESSMENT

Flora and Fauna Assessment

Project Location:
South Kihei Road, between Welakahau and Waimahaihai Streets

Prepared for:
Norman Saito Engineering Consultants, Inc.
Wailuku Townhouse, Suite 203
2158 Main Street
Wailuku, Hawaii 96793

November 23, 1994

Prepared by:
Eric K Nishibayashi
1627 Ainakea Road
Lahaina, Hawaii 96761

Table of Contents

	Page no.
A. Flora and Fauna	1
B. Recommendations	1
References	2
Fees	Appendix

A. Flora and fauna

A flora and fauna survey of the project site was conducted on 12 November 1994. The project site is generally in a developed state with only two open lots that may contain native flora or fauna.

Common exotic plants observed included, but were not limited to, Prosopis pallida (kiawe), Leucaena leucocephala (koa haole), Atriplex suberecta (salt bush), Arundo donax (Spanish reed), Pluchea gymphytifolia (sour bush), and Alternanthera caracasana. Also noted were various exotic grasses. Except for the cultivated, Scaevola taccada (naupaka) which was noted in the adjacent County of Maui pump station (#5) lot, no native plants were observed in the project site, including those that are listed as State or Federally endangered.

Several exotic bird species were observed at the site. Some of the more common species included Passer domesticus (house sparrow), Carpodacus mexicanus (house finch), Cardinalis cardinalis (northern cardinal), and Lonchura punctulata (nutmeg manikin). No native birds were observed and are expected in the area. The non-endangered, indigenous shorebird, Pluvialis fulva (pacific golden plover), was not observed at the site but is likely seen there on occasion.

Arthropods were collected from the site and later identified. No native species were noted. No native mammals are expected to reside at the site and no mammals were observed during the survey.

B. Recommendations

Because the site is located near a wetland zone, care should be taken to ensure the proper removal and disposal of the noxious weed, Arundo donax, which has been known to destroy wetlands in California. A small cluster of the weed is located at the boundary of the Akina and Palusky properties on the East side of South Kihei Road. Further development within the project site will not have any impact on native flora or fauna, since none exists.

REFERENCES

1. Borror, D.J. and R.E. White. 1970. *A Field Guide to the Insects of America North of Mexico*. Houghton Mifflin Company, Boston, Massachusetts.
2. Haus, W. Botanical Consultant.
3. Hawaii Audubon Society 1989. *Hawaii's Birds*. Fourth Edition, Hawaii Audubon Society, Honolulu, Hawaii.
4. Howarth, F.G. and W.P. Mull. 1992. *Hawaiian Insects and Their Kin*. University of Hawaii Press, Honolulu, Hawaii.
5. Neal, M.C. 1965. *In Gardens of Hawaii*. Bishop Museum Press, Honolulu, Hawaii.
6. Wagner, W.L., D.R. Herbst and S.H. Sohmer. 1990. *Manual of the Flowering Plants of Hawaii*. University of Hawaii Press, Honolulu, Hawaii.

APPENDIX "B"

DRAINAGE REPORT

DRAINAGE AND EROSION CONTROL REPORT

FOR

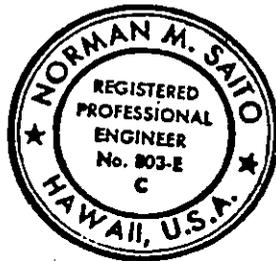
**SOUTH KIHEI ROAD IMPROVEMENTS - PHASE II
(WELAKAHAO TO WAIMAHAIHAI)
FEDERAL AID PROJECT NO. M-BW-3100 ()**

KIHEI, MAUI, HAWAII

LUCA NO. 3.1611

Prepared For:

County of Maui



Norman M. Saito 803-E

This work was prepared by
me or under my supervision

Prepared By:

**NORMAN SAITO ENGINEERING
CONSULTANTS, INC.**

WAILUKU, MAUI, HAWAII

June 1995

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DRAINAGE AND EROSION CONTROL REPORT
FOR
SOUTH KIHEI ROAD IMPROVEMENTS - PHASE II

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Location Map	Figure 1
Project Site	Figure 2
Soil Erosion Control Plan	Appendix "A"
General Site Hydrology Calculation	Appendix "B"
Drainage Basins	Exhibit 1
Catch Basin Analysis	Appendix "C"
Drainage System Calculations	Appendix "D"

**DRAINAGE AND EROSION CONTROL REPORT
FOR
SOUTH KIHEI ROAD IMPROVEMENTS - PHASE II
KIHEI, MAUI, HAWAII**

I. SCOPE:

This report summarizes the drainage conditions and discusses the methods for the protection against flood damage and erosion during construction.

II. REFERENCES:

- A. "Drainage Master Plan for the County of Maui, "R.M. Towill Corporation, October 1971.
- B. "Erosion and Sediment Control Guide for Hawaii, "Soil Conservation Service, 1981.
- C. "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii, "Soil Conservation Service, August 1972.
- D. Flood Insurance Rate Map (FIRM), Federal Emergency Management Agency, Federal Insurance Administration, September 6, 1989.
- E. "Flood Insurance Study", Federal Emergency Management Agency, September 6, 1989.
- F. "Kihei Drainage Master Plan", Norman Saito Engineering Consultants, Inc., September 1994.

III. PROJECT LOCATION:

This project shall improve the drainage and widen South Kihei Road. It shall start where Phase I ended, at Waimahaihai Street, and continue north to Welakahao Road. See Location Map, Figure 1. The improvements shall include road widening, adding curb and gutters, sidewalks and bicycle lanes on both sides of the road and provide a drainage outlet. The storm water shall be routed down Welakahao Road by covered culvert and drain across the county right of way into the ocean.

IV. TSUNAMI INUNDATION:

The National Flood Insurance Program, Flood Insurance Rate Map, Maui County, Hawaii, September 6, 1989, identifies the project as being within zone AH, areas of 100-year shallow flooding.

V. SOIL TYPE:

The "Soil Survey of Islands Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii (August 1972)" classifies the soil type on the project site as JaC, Jaucas Sand of the Jaucas Series. This series consists of excessively drained, calcareous soils.

Permeability is rapid and runoff is slow to very slow. The hazard to water erosion is slight while wind erosion can be severe where vegetation has been removed.

VI. DRAINAGE:

The project site consists of a two lane road (one lane in each direction). Presently, there are no drainage structures on South Kihei Road. The runoff from the adjacent properties and the road sheet flows from east to west (mauka to makai). During storms, storm water ponds on the road, especially along the sides and at intersections. The flooding remains until the water percolates into the ground.

The improvements shall capture the runoff from the adjacent properties, makai of the road, and the runoff from the road utilizing twelve (12) new catch basins located along the gutter line of the proposed widened road. The storm water shall be routed down Kihei Road from Waimahaihai Street to Welakahao Road by concrete pipes and culverts which shall run under the new sidewalks on the mauka side of the road. See Project Site, Figure 2.

A 2' x 5' concrete culvert shall then direct the project runoff from the South Kihei Road and Welakahao Road intersection down Welakahao Road to the county right of way at the end of the road. Presently, there is an old drainage system that appears to have been designed to capture the runoff in the area of the Welakahao Road and Halama Street intersection. An existing out fall pipe runs from a junction box located on the makai side of Halama Street, into the

ocean. This existing pipe disappears under the sand along the access and is assumed to be clogged at its ocean end. A hole in the pipe is visible along the access route. This old system shall be abandoned. The new culvert shall discharge approximately twenty feet makai of the Welakahao and Halama Street intersection. There are existing rock walls on both sides of the access right of way from the Halama Street intersection all the way into the ocean. These shall remain. The properties on either side of the access are also much higher, several feet elevation wise, than the access and thus shall not be affected by the discharge through the access way.

VII. EROSION CONTROL PLAN:

The soil loss for this area has been estimated by the Universal Soil Loss Equation (HESL) in accordance with the County of Maui Grading Ordinance concerning soil erosion and sedimentation control.

The estimated soil loss was used to find the severity number and the minimum tolerable erosion rate versus the estimated erosion rate. The present standards allow a maximum severity number of 50,000 and a minimum tolerable erosion rate versus estimated erosion rate of 1. The calculations are given in Appendix A and the results are shown below:

Estimated soil loss: 8 tons/acre/year

Severity number: $240 < 50,000$

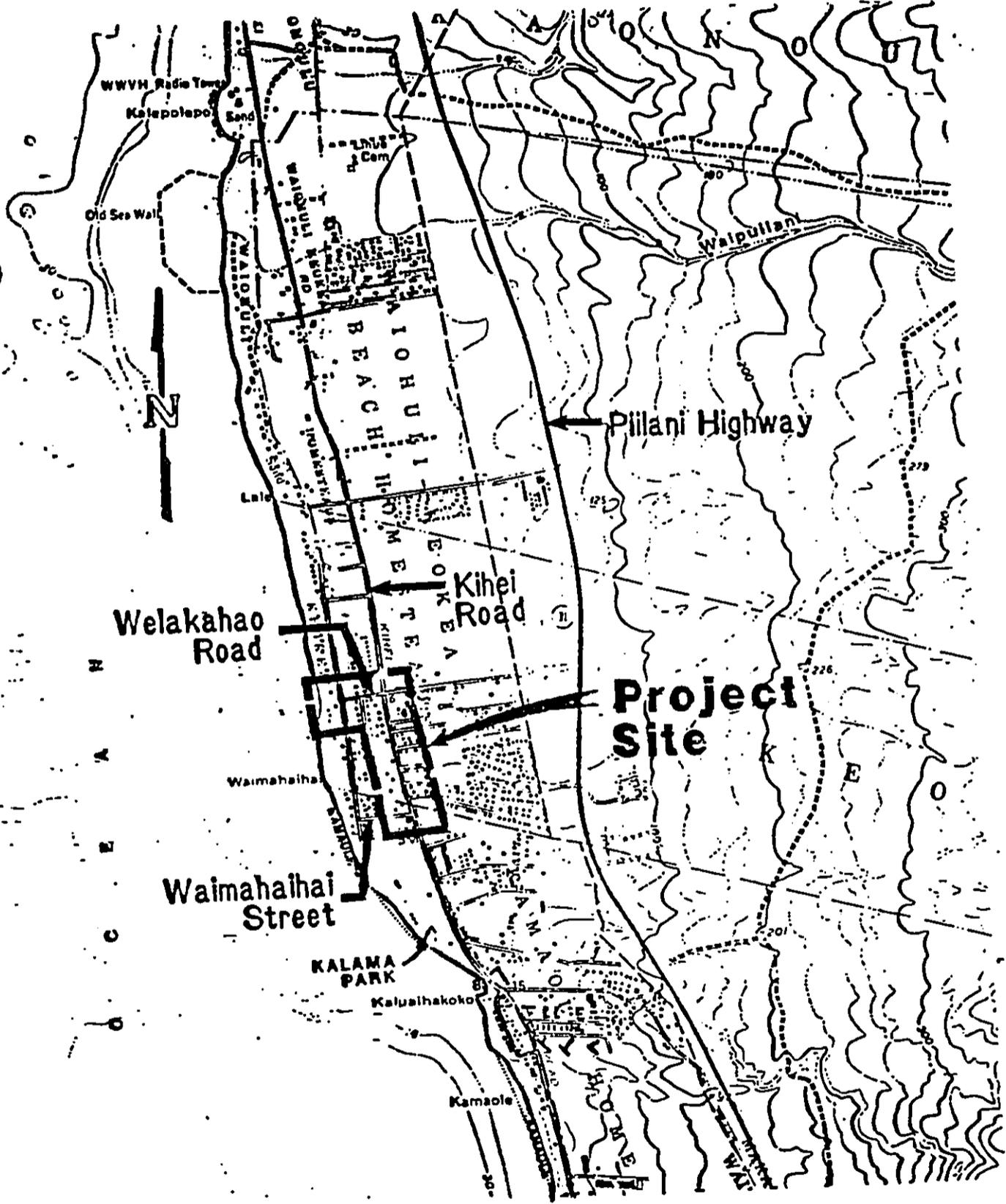
Tolerable Erosion Rate vs. Estimate of Uncontrolled Erosion Rate: $208 > 1$

Normal construction erosion control measures should include:

- A. Dust control by sprinkling with sprinklers/water wagons, as necessary.
- B. Protection of all exposed slopes with temporary diversions, berms and swales at the top of the slopes.
- C. Grassing will take place immediately after grading is completed.

VIII. CONCLUSION:

The proposed project shall improve the drainage on South Kihei Road and relieve ponding along the sides of the road and in some of the adjacent properties. The project also adds to the safety of motorists, bicyclists and pedestrians. The project shall have no adverse effects on either adjacent or down stream properties.



LOCATION MAP



State of Hawaii
Regulation
Reservoir

Proposed
Outlet

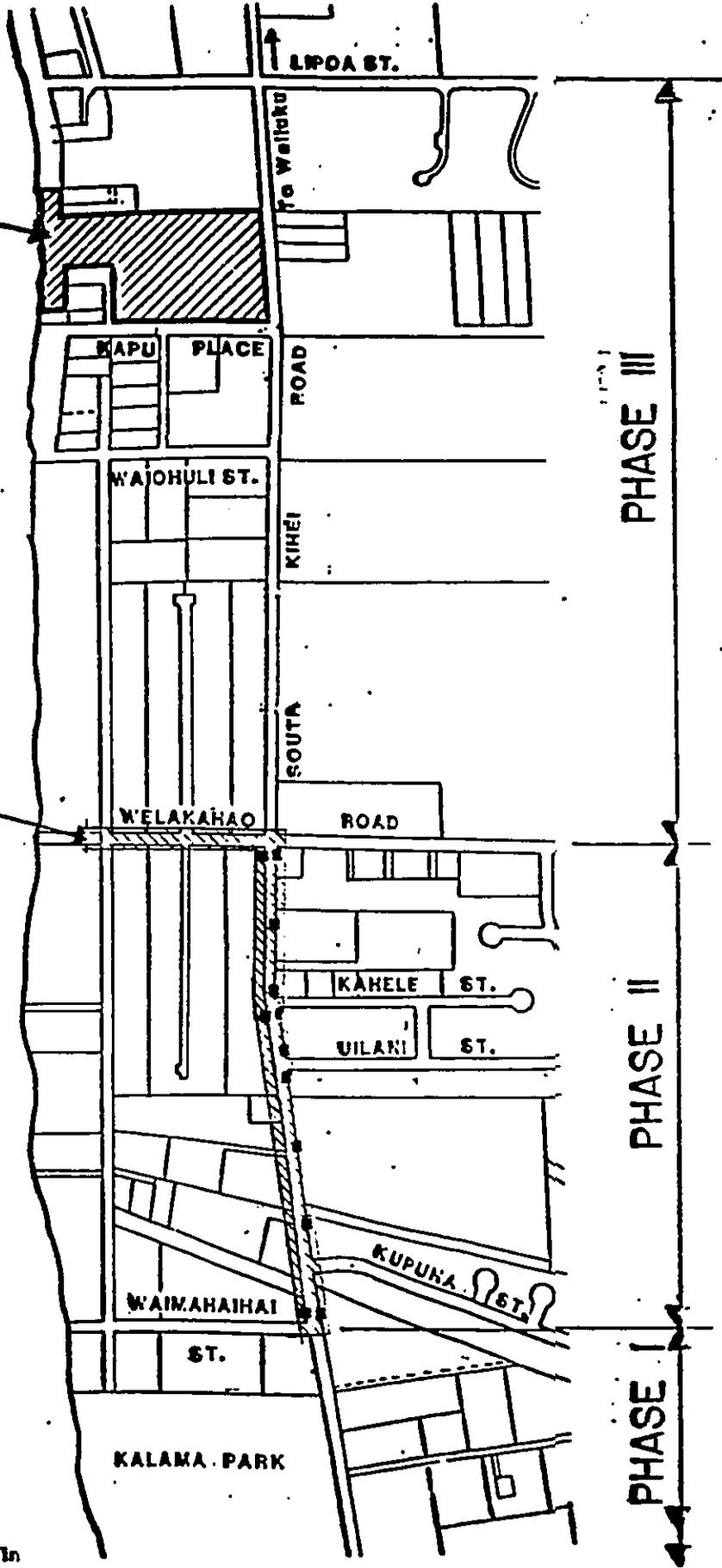
O
C
E
A
N



LEGEND :

■ Catch Basin

500 200 0 500



PHASE III

PHASE II

PHASE I

APPENDIX "A"

SOIL EROSION CONTROL PLAN

APPENDIX "A"
SOIL EROSION CONTROL PLAN

1. SOIL CONDITIONS DURING CONSTRUCTION:

Calculations for maximum area to be graded at once. Landscaping shall proceed after all work has been completed.

2. HESL SOIL LOSS FOR PROJECT DURING CONSTRUCTION:

Erosion Rate, as set forth by the County of Maui Ordinance:

$$E = R * K * LS * C * P$$

Where:

E = Soil Loss in tons/acre/year

R = Rainfall Factor = 150 tons/acre/year

K = Soil Erodibility Factor - Jaucas (JaC) = 0.10

L = LS Factor - Slope Length = 800' (worst case)

S = LS Factor - Slope Gradient = 3 % (worst case)

LS = Slope - Length Factor = 0.536

C = Cover Factor - Bare Soil = 1.0

P = Control Factor = 1.0

$$E = 150 \text{ tons/acre/year} \times 0.10 \times 0.536 \times 1.0 \times 1.0$$

$$= 8 \text{ tons/acre/year}$$

3. ALLOWABLE SOIL LOSS FOR SITE:

Maximum Allowable Construction Area x Erosion Rate = 5,000 tons/year

Project Construction Area = 3 acres

Allowable Erosion Rate = $5,000/3 = 1667$ tons/acre/year

4. **TOLERABLE EROSION RATE VERSUS BEST ESTIMATE OF UNCONTROLLED EROSION RATE:**

$$\frac{1667 \text{ tons/acre/year}}{8 \text{ tons/acre/year}} = 208 > 1$$

5. **SEVERITY NUMBER (H):**

$$H = (2 * F * T + 3 * D) * A * E$$

Where:

H = Severity Number

F = Unit Downslope - Downstream Factor = 4

D = Coastal Water Hazard Rating Factor (Class A) = 2

T = Time of Disturbance (years) = 0.5 year

A = Area of Disturbance = 3 acres

E = Soil Loss Rate from USLE = 8 tons/acre/year

$$H = (2 \times 4 \times 0.5 + 3 \times 2) \times 3 \times 8 = 240 < 50,000$$

6. **CONCLUSION:**

There is no need to implement additional measures to control erosion. Normal construction erosion control measures should be sufficient for the project site, with no excessive soil loss occurring.

APPENDIX "B"

GENERAL SITE HYDROLOGY CALCULATIONS

APPENDIX "B"
10 YEAR STORM FLOW

RUNOFF COEFFICIENT (C):

MAUKA AREAS:

Infiltration	Medium	0.07
Relief	Flat	0.00
Vegetal Cover	Good	0.03
Development	Residential	<u>0.40</u>
Total C =		0.50

MAKAI AREAS:

Infiltration	Slow	0.14
Relief	Flat	0.00
Vegetal Cover	None	0.07
Development	Residential	<u>0.40</u>
Total C =		0.61

SUMMARY OF FLOWS:

Basin No.	C.B. No.	C	Tc (Min.)	i (in/hr)	A (Acres)	Q (cfs)
1	9	0.50	20	3.3	2.19	3.61
2	8	0.50	25	3.0	3.04	4.56
3	7	0.50	16	3.7	1.94	3.60
4	6	0.50	14	3.7	1.58	2.92
5	5	0.50	14	3.7	1.51	1.85
6	4	0.50	24	3.0	3.37	5.06
7	3	0.50	24	3.0	2.24	3.36
8	2	0.50	17	3.7	2.57	4.75
9	1	0.50	8	4.4	0.68	1.50
10	1	0.50	8	4.4	0.42	0.92
11	1A	0.61	7	4.6	0.34	0.95
12	6A	0.61	16	3.6	0.99	2.17
13	9A	0.61	7	4.6	0.37	1.04

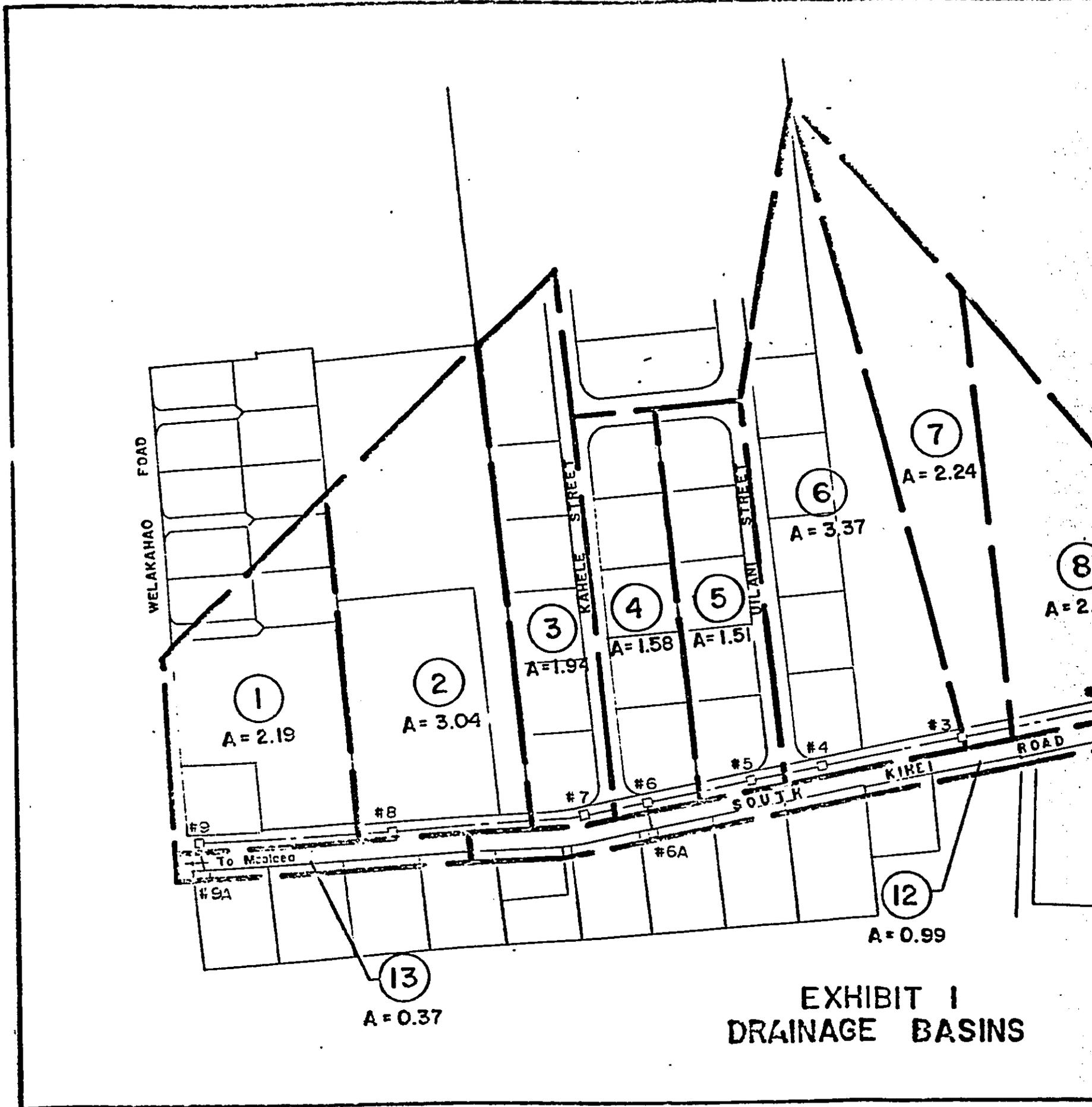


EXHIBIT I
DRAINAGE BASINS

TRUE NORTH
Not To Scale

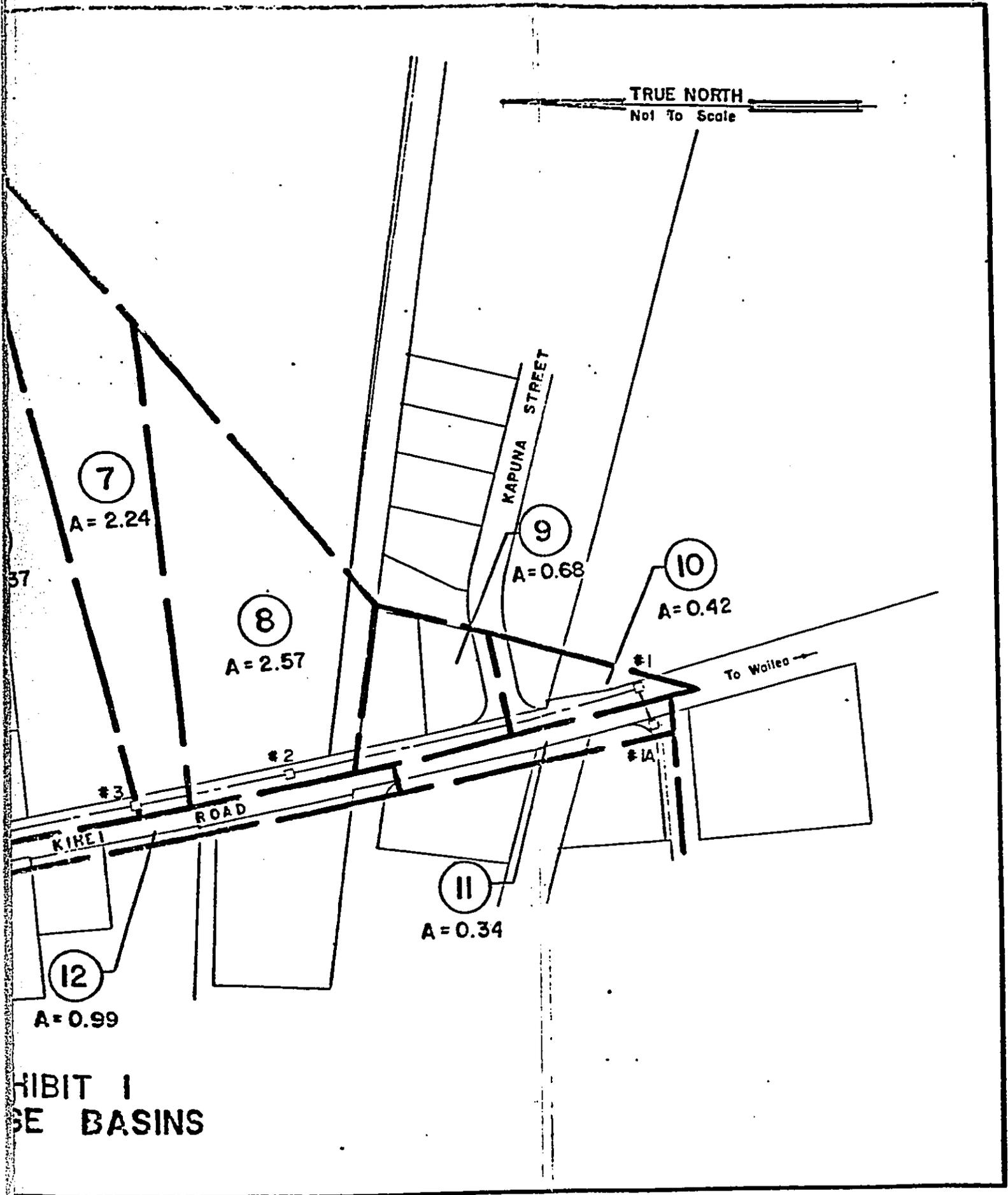


EXHIBIT I
SE BASINS

APPENDIX "C"

CATCH BASIN ANALYSIS

APPENDIX "C"
CATCH BASIN ANALYSIS

Inlet Capacity for Curb Opening Inlet: $d = 0.25'$ and $h = 0.5'$

Since depth (d) < opening (h) use weir equation.

$$Q_i = C_w(L + 1.8W)d^{1.5}$$

Where:

$C_w = 2.3$

$L =$ Length of Opening

$W =$ Lateral Width of Opening

$d =$ Depth

C.B. Type	L (feet)	W (feet)	Q _i (cfs)
A	20.67	2	7.00
B or C	14.00	2	5.06
D	7.33	2	3.14

APPENDIX "D"

DRAINAGE SYSTEM CALCULATIONS

HYDRAULIC REPORT FOR

South Kihei Road

Waimahaihai Street

to

Welakahao Road

Outlet at

Beach access at end of

Welakahao Road

E

STORM SEWER TABULATION

DATA FILE: KHEI.5T3
 RAINFALL FILE: Your_Cty.RN3
 PRINTED: 08-11-1995

10 YEAR DESIGN STORM

G = CIA

I = 73.441 / (To + 14.250) ^ 0.788

PAGE 1 OF 2

LINE No.	INC AREA (AC)	RNOFF COEFF (C)	INC C*A	SUM C*A	TIME CONC (MIN)	RNFAL INT I (IPH)	TOTAL FLOW Q=CA*I, Ado (CFS)	PIPE CAP (CFS)	PIPE SIZE (IN)	PIPE LEN (FT)	PIPE SLOPE (%)	HYD GRO SLOPE (%)	VEL UP/DN (FPS)	HYD GRO UP/DN (FT)	INVERT UP/DN (FT)	COMMENTS/ DOWNSTREAM LINE #
14	0.0	0.00	0.0	0.0	0.0	0.00	0.95 0.00 0.9	8.0 24	18	60	0.167	0.039	0.46 0.42	6.05 6.02	5.00 4.90	#1A to #1 13
13	0.0	0.00	0.0	0.0	2.3	0.00	3.37 0.00 2.4	7.8 24	18	370	0.162	0.032	1.55 1.12	5.98 5.86	4.90 4.30	#1 to #2 12
12	0.0	0.00	0.0	0.0	6.9	0.00	8.12 0.00 4.8	10.0 24	24	254	0.197	0.187	3.54 3.47	5.67 5.20	4.30 3.80	#2 to #3 11
11	0.0	0.00	0.0	0.0	8.1	0.00	11.48 0.00 3.4	13.9 36	18	130	0.185	0.092	3.06 2.79	5.05 4.93	3.80 3.56	#3 to #4 10
10	0.0	0.00	0.0	0.0	8.8	0.00	16.54 0.00 5.1	23.9 48	18	117	0.274	0.051	3.51 2.86	4.74 4.68	3.56 3.24	#4 to #5 9
9	0.0	0.00	0.0	0.0	9.4	0.00	18.39 0.00 1.9	35.2 48	18	125	0.592	0.096	3.78 3.06	4.46 4.34	3.24 2.50	#5 to #6 8
8	0.0	0.00	0.0	0.0	10.0	0.00	23.48 0.00 2.9	32.0 60	24	122	0.123	0.033	2.73 2.57	4.22 4.18	2.50 2.35	#6 to #7 7
7	0.0	0.00	0.0	0.0	10.8	0.00	27.08 0.00 3.6	28.9 60	24	209	0.100	0.077	3.25 3.16	4.02 3.86	2.35 2.14	#7 to #8 6
6	0.0	0.00	0.0	0.0	11.9	0.00	31.64 0.00 4.6	42.9 60	24	268	0.220	0.104	4.52 3.70	3.54 3.26	2.14 1.55	#8 to #9 5
5	0.0	0.00	0.0	0.0	13.0	0.00	32.68 0.00 0.0	43.8 60	24	26	0.230	0.077	4.15 4.05	3.13 3.11	1.55 1.49	#5 to #9 4
4	0.0	0.00	0.0	0.0	13.1	0.00	32.68 0.00 0.0	41.2 60	24	64	0.203	0.125	4.48 4.33	2.95 2.87	1.49 1.36	#5 to #5 3
3	0.0	0.00	0.0	0.0	13.3	0.00	32.68 0.00 0.0	42.0 60	24	591	0.212	0.184	4.96 4.42	2.68 1.59	1.36 0.11	22.5 to #5 2
2	0.0	0.00	0.0	0.0	15.4	0.00	32.68 0.00 0.0	41.9 60	24	33	0.210	0.180	4.76 4.72	1.48 1.42	0.11 0.04	22.5 to 22.5 1
1	0.0	0.00	0.0	0.0	15.6	0.00	32.68 0.00 0.0	46.6 60	24	12	0.261	0.174	5.20 5.15	1.30 1.28	0.04 0.01	outfall to 22.5 OUTFALL

E
 STORM SEWER TABULATION (continued)
 DATA FILE: KIMEI.ST3
 RAINFALL FILE: Your_Cty.RN3
 PRINTED: 08-11-1995

10 YEAR DESIGN STORM

Q = CIA

I = 72.441 / (To + 14.250) ^ 0.788

PAGE 2 OF 2

LINE No.	INC AREA (AC)	RNOFF COEFF (C)	INC C*A	SUM C*A	TIME CONC (MIN)	RNFAL INT I (IPH)	TOTAL FLOW Q=CA*I, DFG (CFS)	PIPE CAP (CFS)	PIPE SIZE HT/W (IN)	PIPE LEN (FT)	PIPE SLOPE (%)	HYD GRD SLOPE (%)	VEL UP/DN (FPS)	HYD SRD UP/DOWN (FT)	INVERT UP/DOWN (FT)	COMMENTS/ DOWNSTREAM LINE #
15	0.0	0.00	0.0	0.0	0.0	0.00	2.17	8.0	18	60	0.167	0.026	0.72	4.35	2.60	#6A to #6 8
							0.00	2.2	24				0.72	4.34	2.50	
16	0.0	0.00	0.0	0.0	0.0	0.00	1.04	8.0	18	60	0.167	0.006	0.35	3.26	1.65	#9A to #9 5
							0.00	1.0	24				0.35	3.26	1.55	

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
 Rainfall file: Your_Cty

Run Date: 07-18-1995
 File: KIHEI.ST3

 LINE 1 / Q = 32.68 / HT = 24 / WID = 60 / N = .013 / L = 11.5 / JLC = .3

 outfall to 22.5 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	1.28	15.22	0.01	5.15	1.69	60.00	1.49	6.34
UPSTRM	1.30	15.10	0.04	5.20	1.72	60.00	1.96	6.29

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2609
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.2312
Time of conc (min) =	15.56	Critical depth (in) =	13.18
Inlet time (min) =	0.00	Natural ground elev. (ft) =	4.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	46.65

Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

 LINE 2 / Q = 32.68 / HT = 24 / WID = 60 / N = .013 / L = 33.3 / JLC = .3

 22.5 to 22.5 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	1.42	16.61	0.04	4.72	1.77	60.00	1.96	6.92
UPSTRM	1.48	16.49	0.11	4.76	1.84	60.00	1.89	6.87

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2102
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1954
Time of conc (min) =	15.44	Critical depth (in) =	13.18
Inlet time (min) =	0.00	Natural ground elev. (ft) =	4.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	41.87

Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 3 / Q = 32.68 / HT = 24 / WID = 60 / N = .013 / L = 591 / JLC = .8
 22.5 to 45 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	1.59	17.75	0.11	4.42	1.89	60.00	1.89	7.40
UPSTRM	2.68	15.82	1.36	4.96	3.06	60.00	.63	6.59

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2115
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1976
Time of conc (min) =	13.34	Critical depth (in) =	13.18
Inlet time (min) =	0.00	Natural ground elev. (ft) =	4.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	42.00
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 4 / Q = 32.68 / HT = 24 / WID = 60 / N = .013 / L = 63.9 / JLC = .8
 45 to 45 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	2.87	18.11	1.36	4.33	3.16	60.00	.63	7.55
UPSTRM	2.95	17.51	1.49	4.48	3.26	60.00	1	7.30

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2034
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1569
Time of conc (min) =	13.10	Critical depth (in) =	13.18
Inlet time (min) =	0.00	Natural ground elev. (ft) =	4.50
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	41.19
Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 5 / Q = 32.68 / HT = 24 / WID = 60 / N = .013 / L = 26.1 / JLC = .5

45 to #9 / DNLN = 4

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.11	19.38	1.49	4.05	3.36	60.00	1	8.08
UPSTRM	3.13	18.90	1.55	4.15	3.39	60.00	1.45	7.88

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2299
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1267
Time of conc (min) =	12.99	Critical depth (in) =	13.18
Inlet time (min) =	0.00	Natural ground elev. (ft) =	5.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.00
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	43.79

Q catchment (cfs) =	0.00	Inlet length (ft) =	0.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.0000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0000
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 6 / Q = 31.64 / HT = 24 / WID = 60 / N = .013 / L = 268 / JLC = 1

#8 to #9 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.26	20.51	1.55	3.70	3.47	60.00	1.45	8.54
UPSTRM	3.54	16.79	2.14	4.52	3.86	60.00	1.35	6.99

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2201
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1436
Time of conc (min) =	11.91	Critical depth (in) =	12.90
Inlet time (min) =	0.00	Natural ground elev. (ft) =	5.50
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	4.56
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	42.85

Q catchment (cfs) =	0.00	Inlet length (ft) =	14.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 7 / Q = 27.08 / HT = 24 / WID = 60 / N = .013 / L = 209 / JLC = 1

#7 to #8 / DNLN = 6

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.86	20.60	2.14	3.16	4.01	60.00	1.35	8.58
UPSTRM	4.02	20.00	2.35	3.25	4.18	60.00	1.15	8.33

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1005
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0811
Time of conc (min) =	10.82	Critical depth (in) =	11.63
Inlet time (min) =	0.00	Natural ground elev. (ft) =	5.50
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	3.60
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	28.95

Q catchment (cfs) =	0.00	Inlet length (ft) =	14.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 8 / Q = 23.48 / HT = 24 / WID = 60 / N = .013 / L = 122 / JLC = 1

#6 to #7 / DNLN = 7

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.18	21.97	2.35	2.57	4.28	60.00	1.15	9.15
UPSTRM	4.22	20.65	2.50	2.73	4.34	60.00	1.4	8.60

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1230
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0438
Time of conc (min) =	10.05	Critical depth (in) =	10.58
Inlet time (min) =	0.00	Natural ground elev. (ft) =	5.90
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	2.92
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	32.02

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 9 / Q = 18.39 / HT = 18 / WID = 48 / N = .013 / L = 125 / JLC = 1

#5 to #6 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.34	18.00	2.50	3.06	4.48	0.00	1.9	6.00
UPSTRM	4.46	14.60	3.24	3.78	4.68	48.00	1.35	4.87

Drainage area (ac) =	0.00	Slope of invert (%) =	0.5920
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1568
Time of conc (min) =	9.44	Critical depth (in) =	10.43
Inlet time (min) =	0.00	Natural ground elev. (ft) =	6.10
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	1.85
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	35.22

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 10 / Q = 16.54 / HT = 18 / WID = 48 / N = .013 / L = 117 / JLC = 1

#4 to #5 / DNLN = 9

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.68	17.26	3.24	2.88	4.81	48.00	1.35	5.75
UPSTRM	4.74	14.14	3.56	3.51	4.93	48.00	1.44	4.71

Drainage area (ac) =	0.00	Slope of invert (%) =	0.2735
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1051
Time of conc (min) =	8.83	Critical depth (in) =	9.72
Inlet time (min) =	0.00	Natural ground elev. (ft) =	6.50
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	5.06
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	23.94

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 11 / Q = 11.48 / HT = 18 / WID = 36 / N = .013 / L = 130 / JLC = 1

#3 to #4 / DNLN = 10

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.93	16.43	3.56	2.79	5.05	36.00	1.44	4.11
UPSTRM	5.05	14.99	3.80	3.06	5.20	36.00	1.7	3.75

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1846
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1111
Time of conc (min) =	8.09	Critical depth (in) =	9.23
Inlet time (min) =	0.00	Natural ground elev. (ft) =	7.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	3.36
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	13.92

Q catchment (cfs) =	0.00	Inlet length (ft) =	14.00
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 12 / Q = 8.12 / HT = 24 / WID = 24 / N = .013 / L = 254 / JLC = 1

#2 to #3 / DNLN = 11

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.20	16.74	3.80	3.47	5.38	20.04	1.2	2.34
UPSTRM	5.67	16.44	4.30	3.54	5.86	22.30	1.69	2.29

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1969
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.1900
Time of conc (min) =	6.88	Critical depth (in) =	12.11
Inlet time (min) =	0.00	Natural ground elev. (ft) =	8.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	4.75
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	10.04

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 13 / Q = 3.37 / HT = 18 / WID = 24 / N = .013 / L = 370 / JLC = 1

#1 to #2 / DNLN = 12

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	5.86	18.00	4.30	1.12	5.88	0.00	2.19	3.00
UPSTRM	5.98	13.02	4.90	1.55	6.02	24.00	1.7	2.17

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1622
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0373
Time of conc (min) =	2.27	Critical depth (in) =	5.35
Inlet time (min) =	0.00	Natural ground elev. (ft) =	8.10
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	2.42
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	7.85

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

LINE 14 / Q = 0.95 / HT = 18 / WID = 24 / N = .013 / L = 60 / JLC = 1

#1A to #1 / DNLN = 13

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	6.02	13.46	4.90	0.42	6.02	24.00	1.7	2.24
UPSTRM	6.05	12.50	5.00	0.46	6.05	24.00	1.5	2.08

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1667
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0394
Time of conc (min) =	0.00	Critical depth (in) =	2.30
Inlet time (min) =	0.00	Natural ground elev. (ft) =	8.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.00
Cumulative C*A =	0.00	Additional Q (cfs) =	0.95
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	7.96

Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

STORM SEWER DESIGN / ANALYSIS

Return Period = 10 Yrs
 Rainfall file: Your_Cty

Run Date: 08-11-1995
 File: KIHEI.ST3

LINE 15 / Q = 2.17 / HT = 18 / WID = 24 / N = .013 / L = 60 / JLC = 1

#6A to #6 / DNLN = 8

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	4.34	18.00	2.50	0.72	4.34	0.00	1.9	3.00
UPSTRM	4.35	18.00	2.60	0.72	4.36	0.00	1.9	3.00

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1667
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0259
Time of conc (min) =	0.00	Critical depth (in) =	3.99
Inlet time (min) =	0.00	Natural ground elev. (ft) =	6.00
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.25
Cumulative C*A =	0.00	Additional Q (cfs) =	2.17
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	7.96
Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

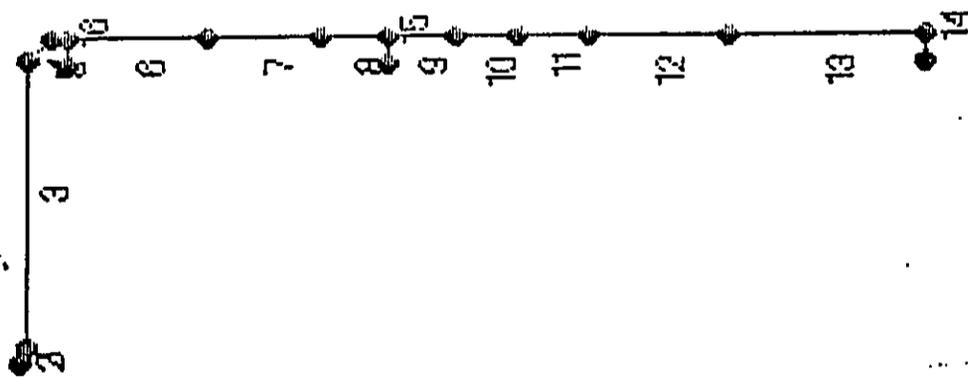
LINE 16 / Q = 1.04 / HT = 18 / WID = 24 / N = .013 / L = 60 / JLC = 1

#9A to #9 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	3.26	18.00	1.55	0.35	3.26	0.00	1.95	3.00
UPSTRM	3.26	18.00	1.65	0.35	3.26	0.00	1.65	3.00

Drainage area (ac) =	0.00	Slope of invert (%) =	0.1667
Runoff coefficient =	0.00	Slope energy grade line (%) =	0.0028
Time of conc (min) =	0.00	Critical depth (in) =	2.44
Inlet time (min) =	0.00	Natural ground elev. (ft) =	4.80
Intensity (in/hr) =	0.00	Upstream surcharge (ft) =	0.11
Cumulative C*A =	0.00	Additional Q (cfs) =	1.04
Q = CA * I (cfs) =	0.00	Line capacity (cfs) =	7.96
Q catchment (cfs) =	0.00	Inlet length (ft) =	7.40
Q carryover (cfs) =	0.00	Gutter slope (ft/ft) =	0.2000
Q captured (cfs) =	0.00	Cross slope (ft/ft) =	0.0650
Q bypassed (cfs) =	0.00	Ponding width (ft) =	N/A

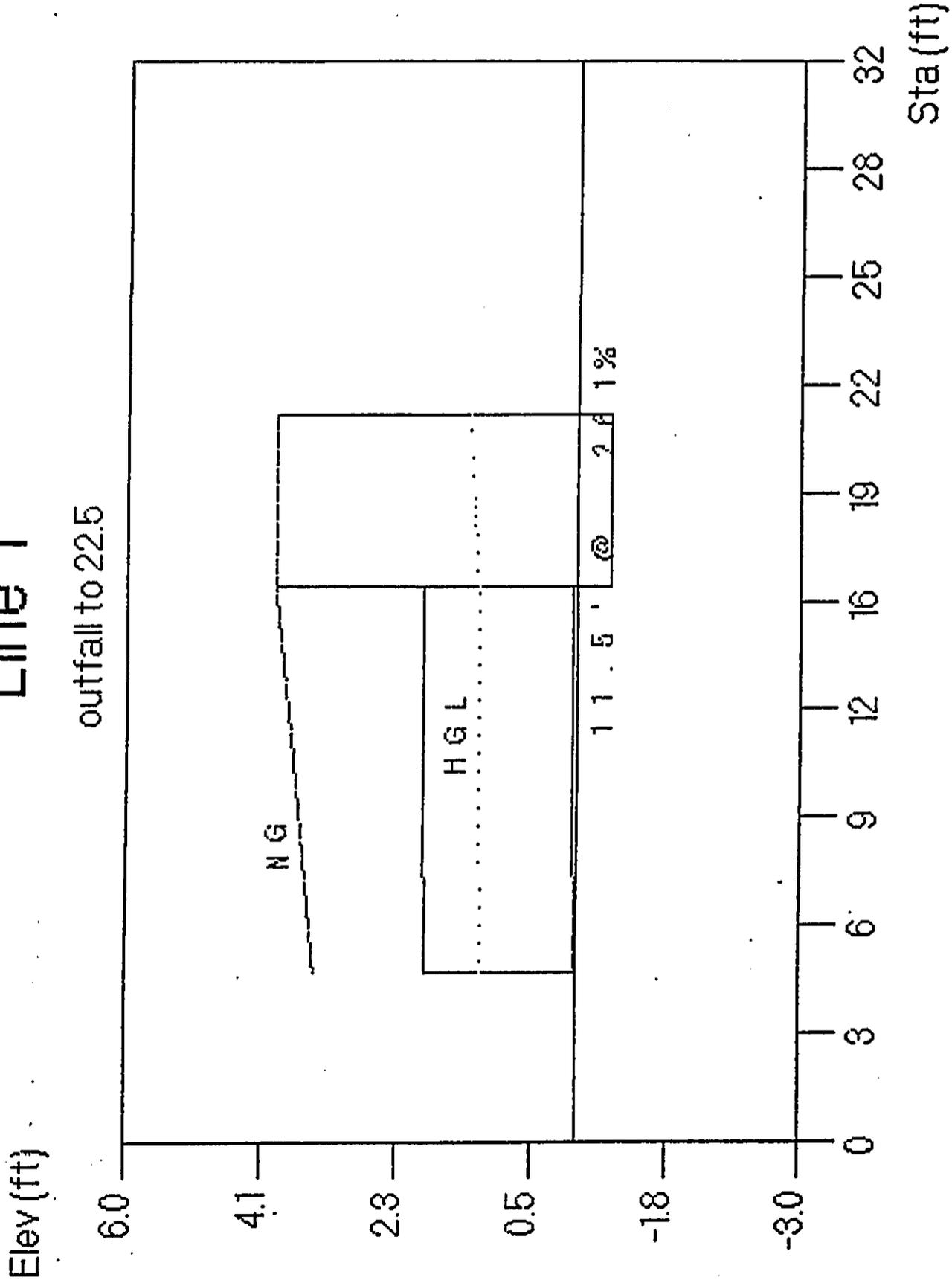
200'



LINE LAYOUT

Line 1

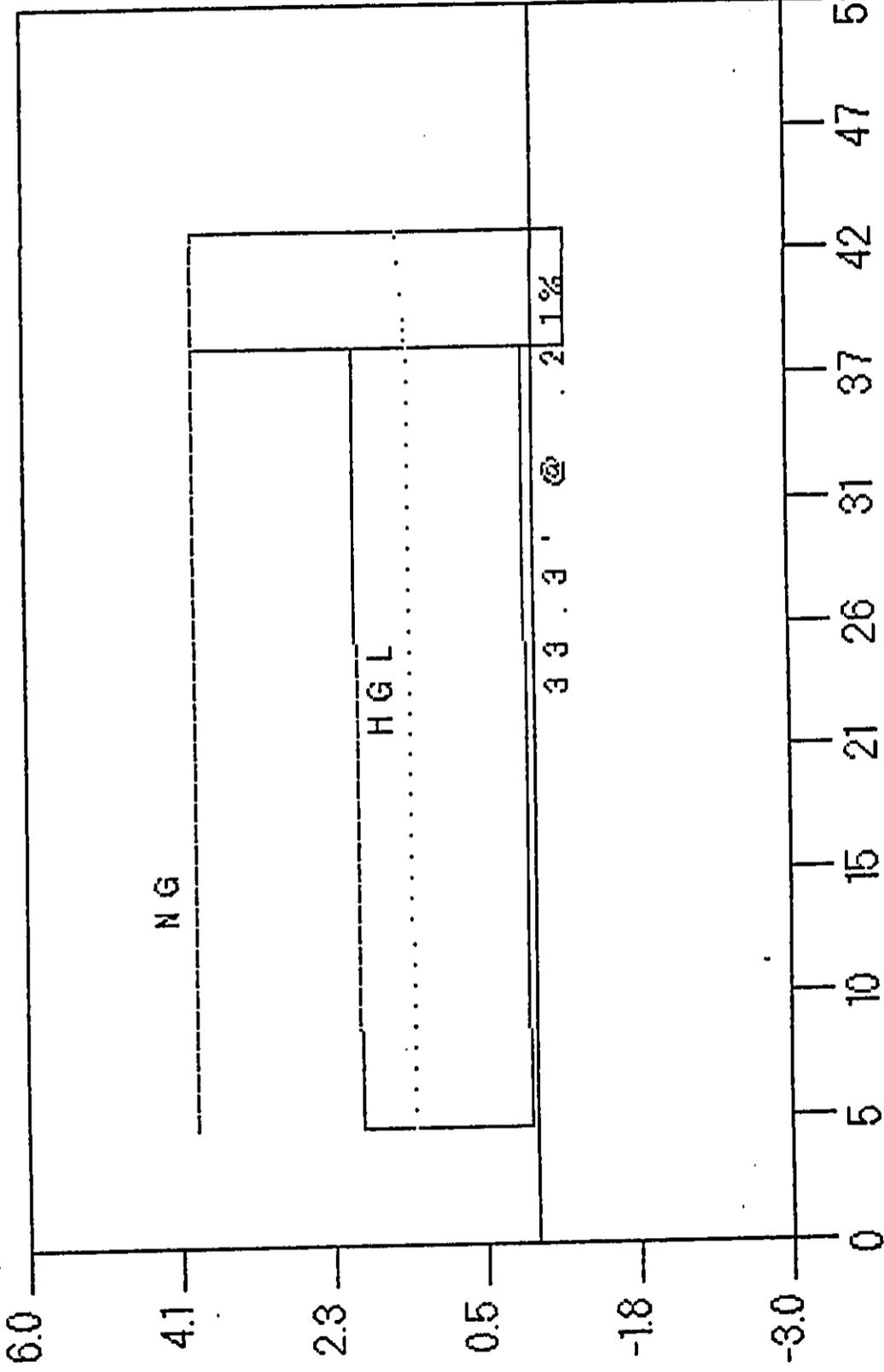
outfall to 22.5



Line 2

22.5 to 22.5

Elev (ft)

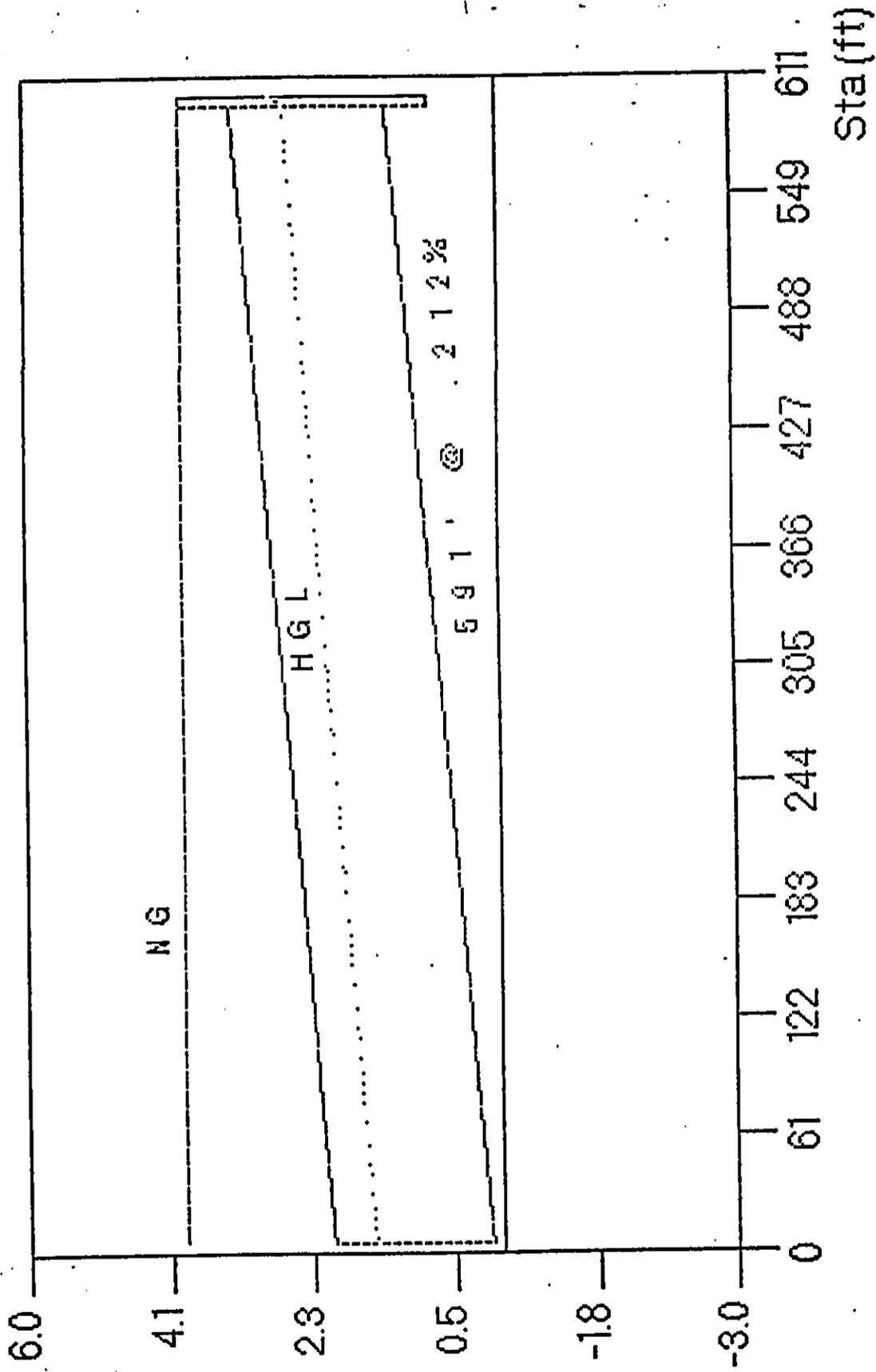


Sta (ft)

Line 3

22.5 to 45

Elev (ft)

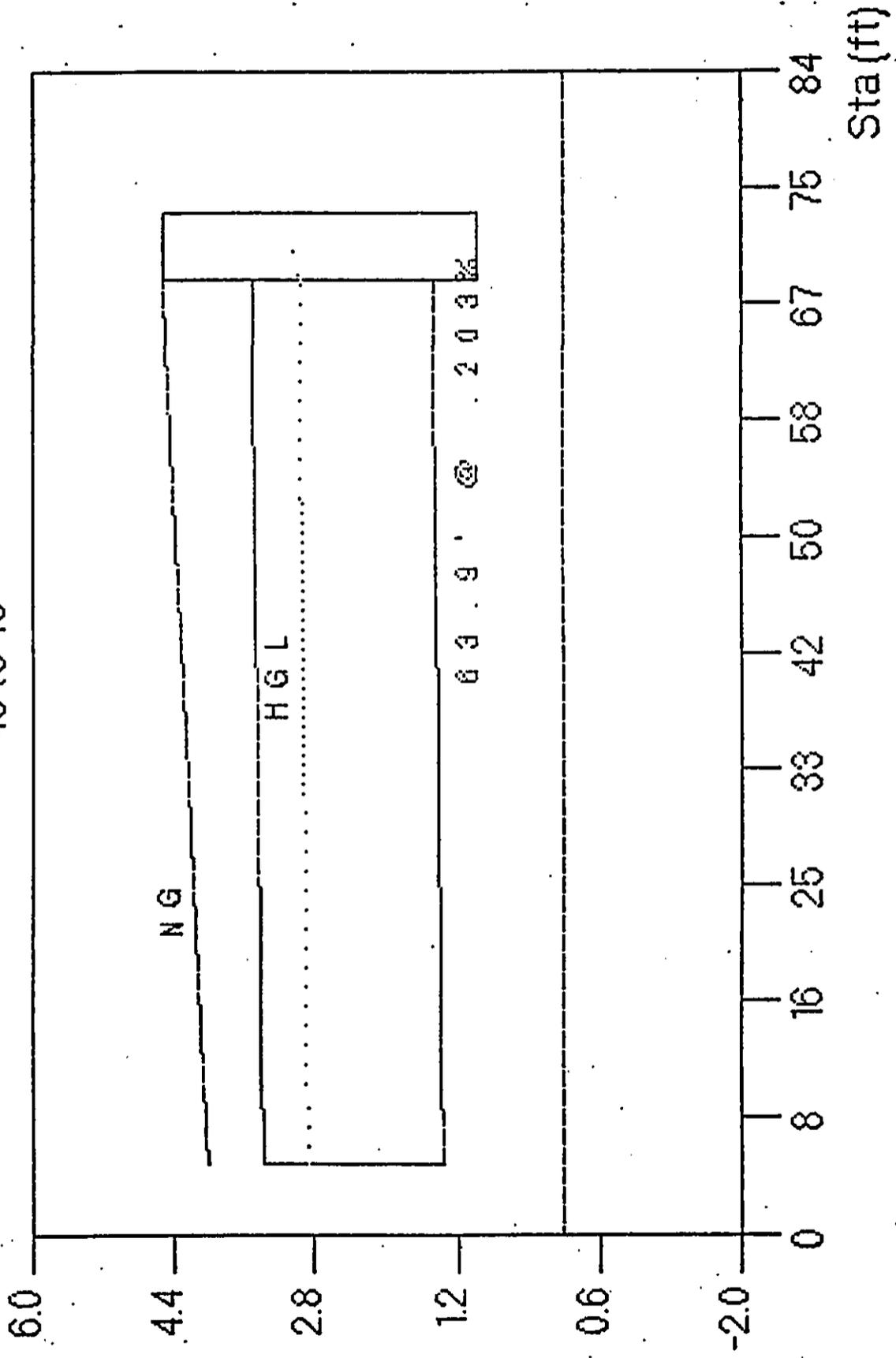


Sta (ft)

Line 4

45 to 45

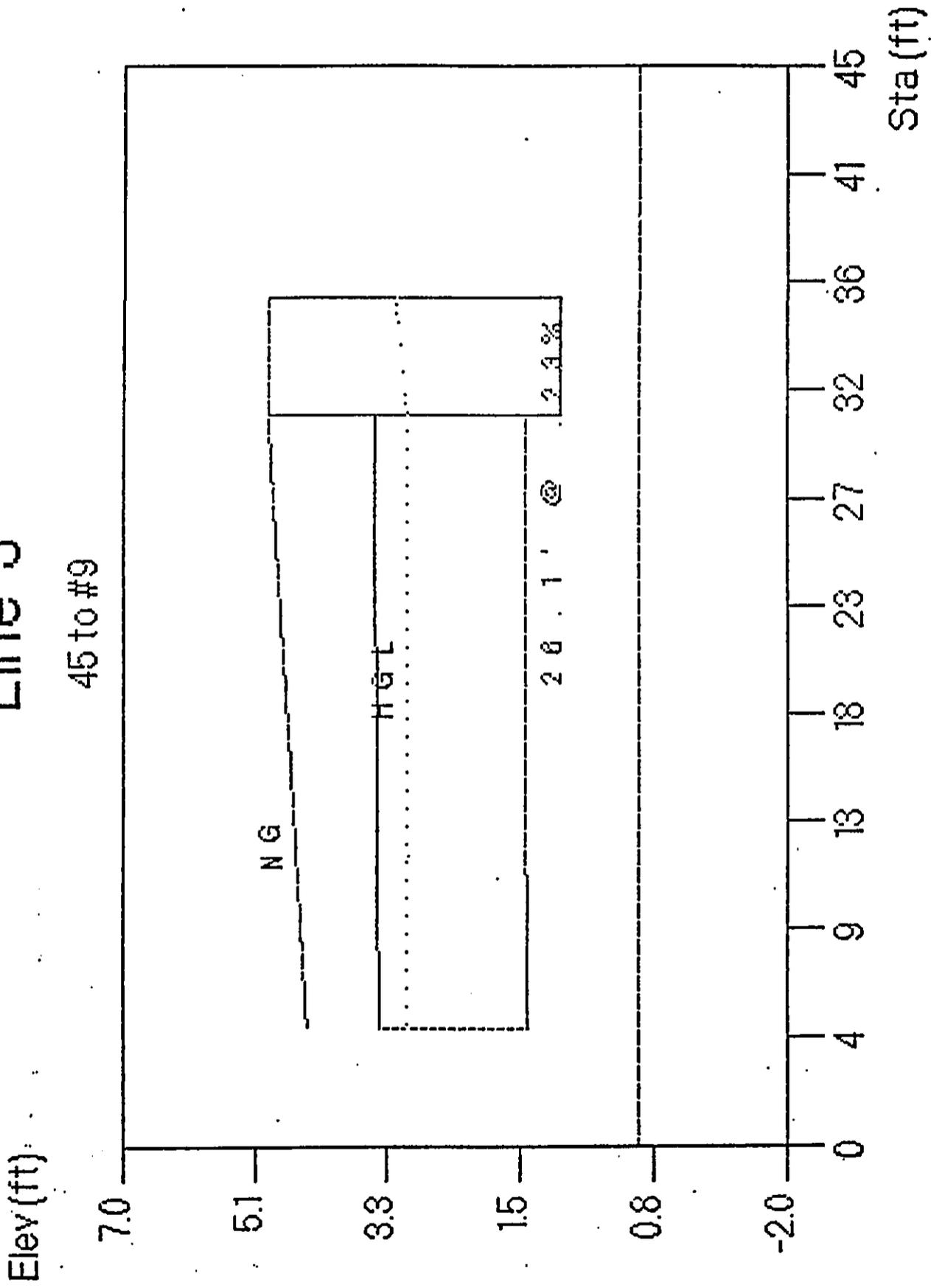
Elev (ft)



Sta (ft)

Line 5

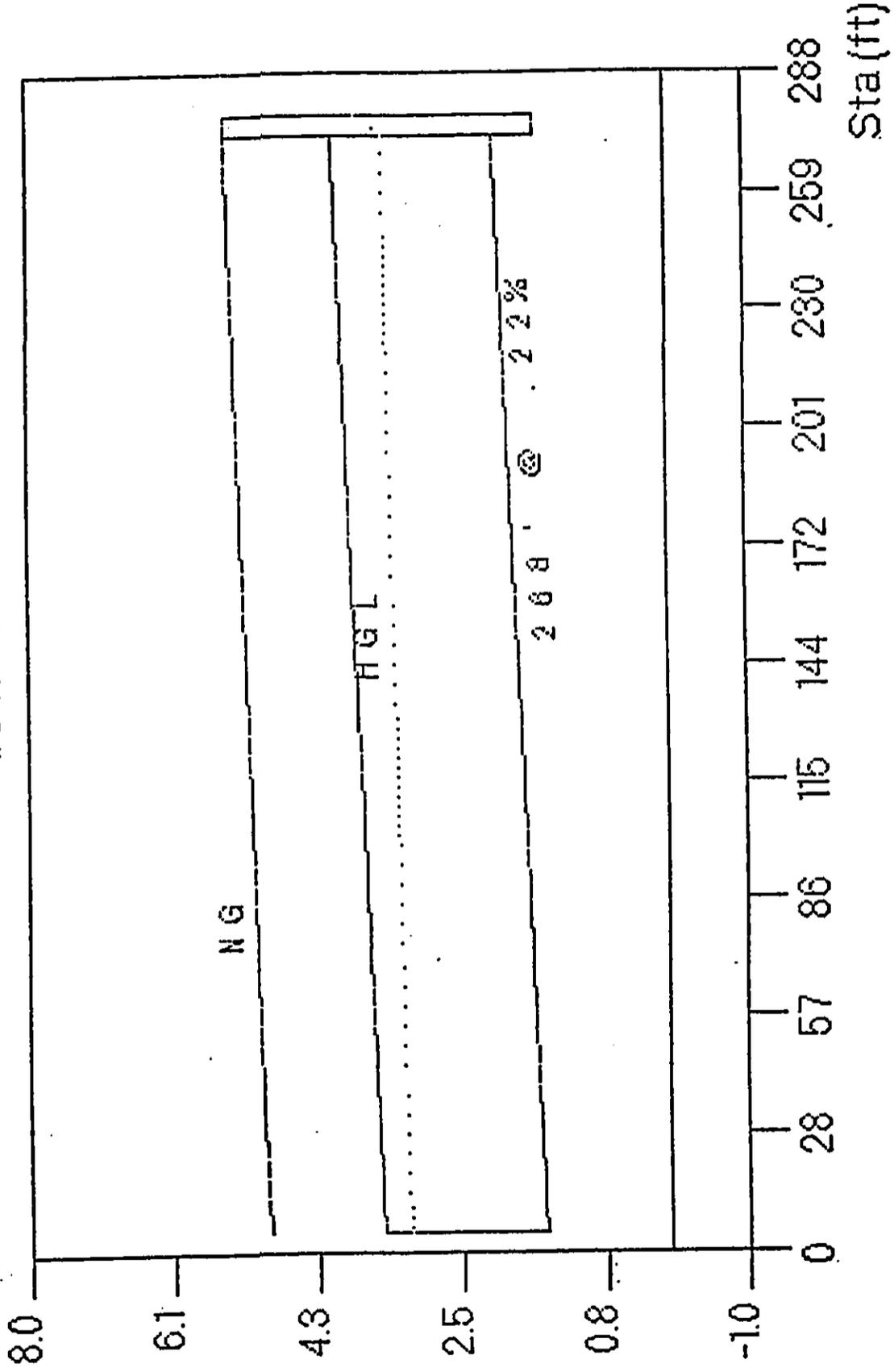
45 to #9



Line 6

#8 to #9

Elev (ft)

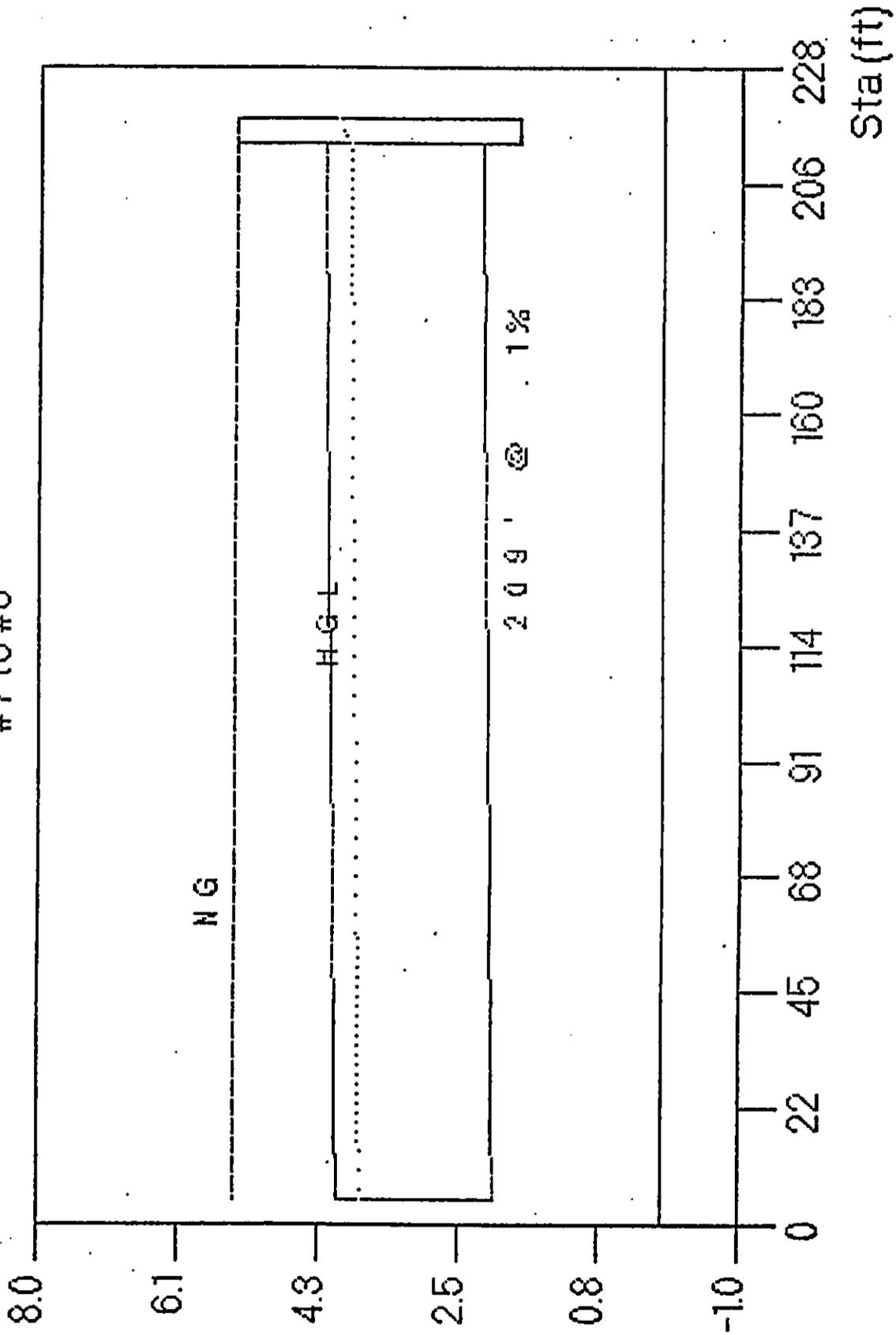


Sta (ft)

Line 7

#7 to #8

Elev (ft)

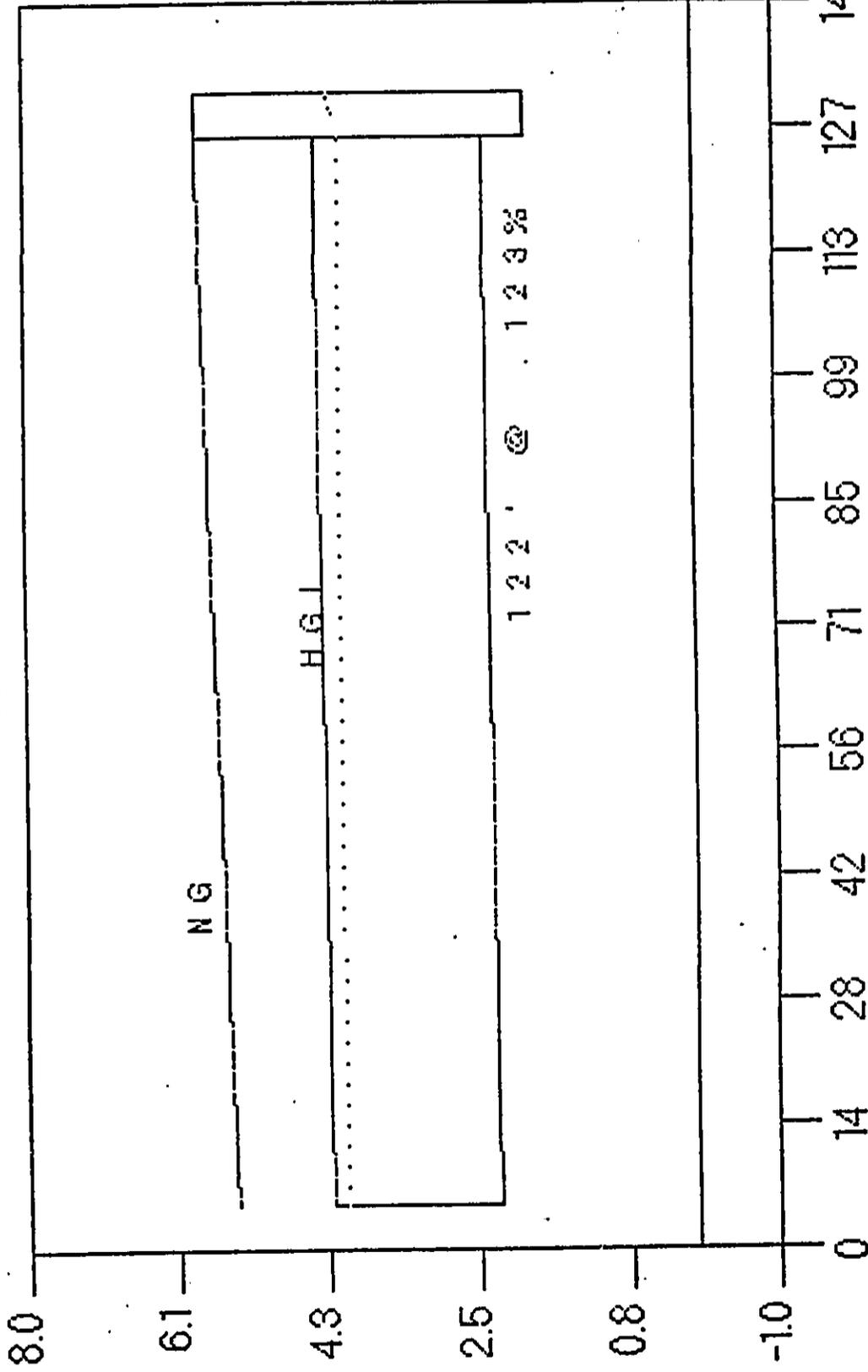


Sta (ft)

Line 8

#6 to #7

Elev (ft)

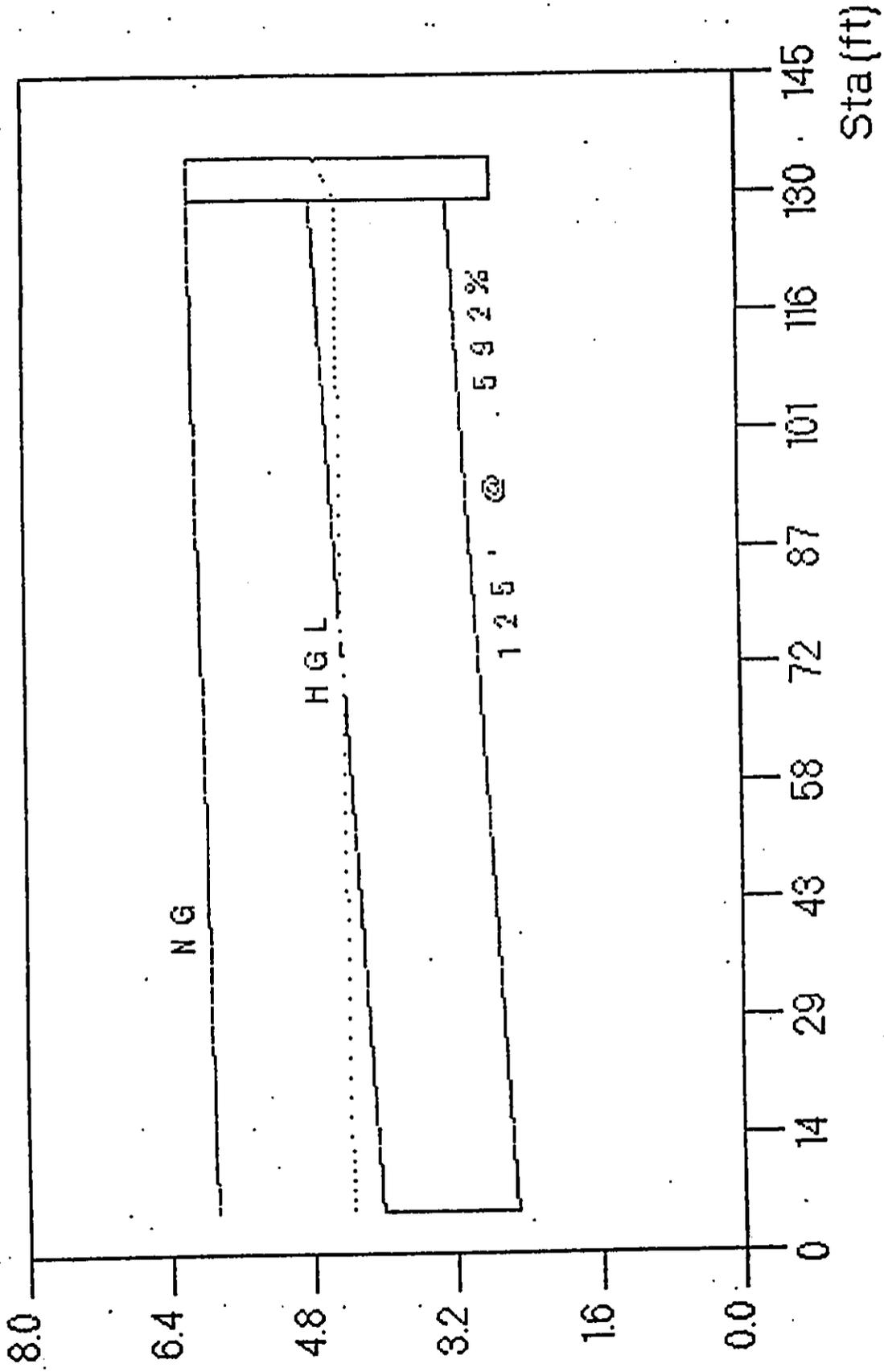


Sta (ft)

Line 3

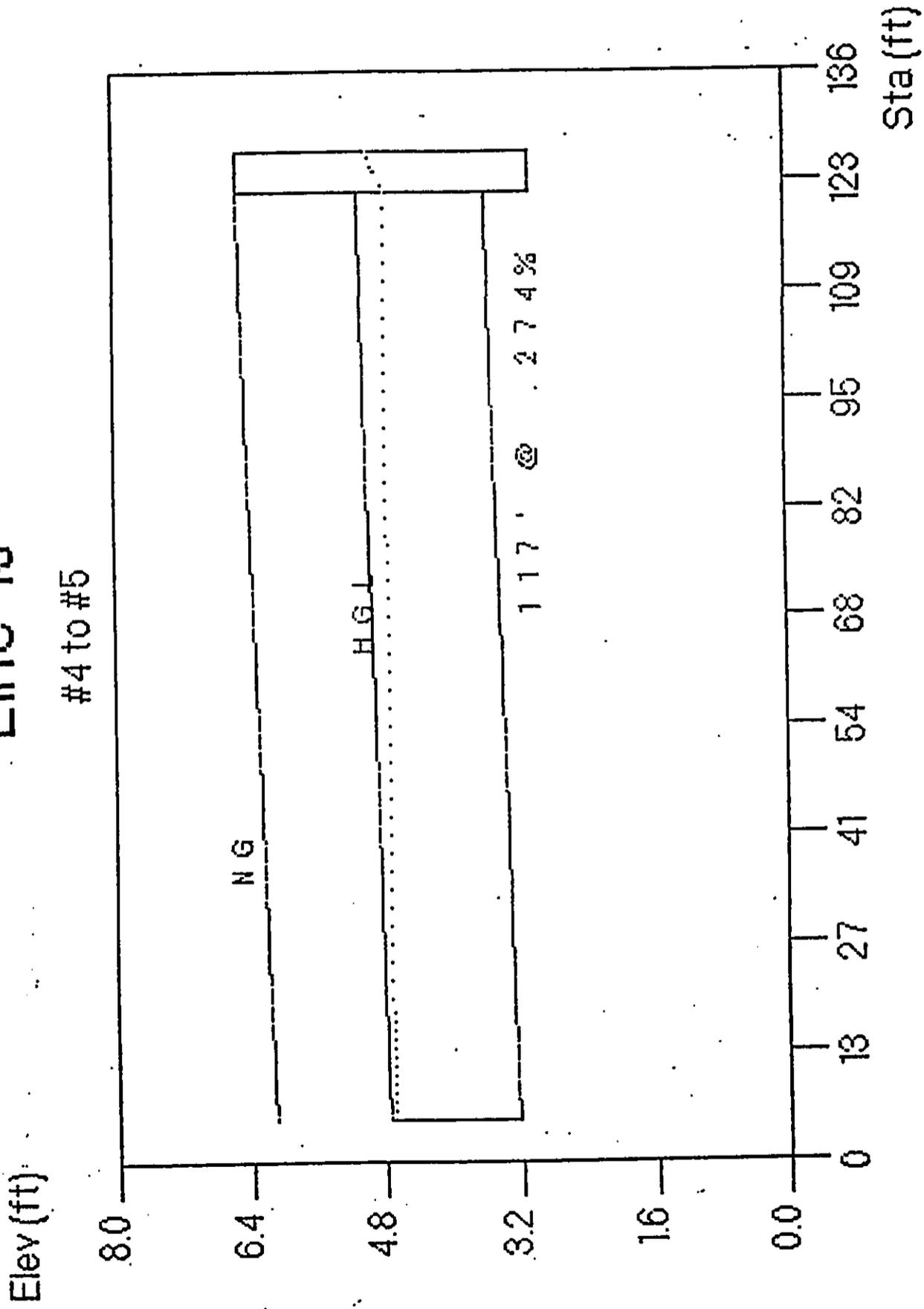
#5 to #6

Elev. (ft)



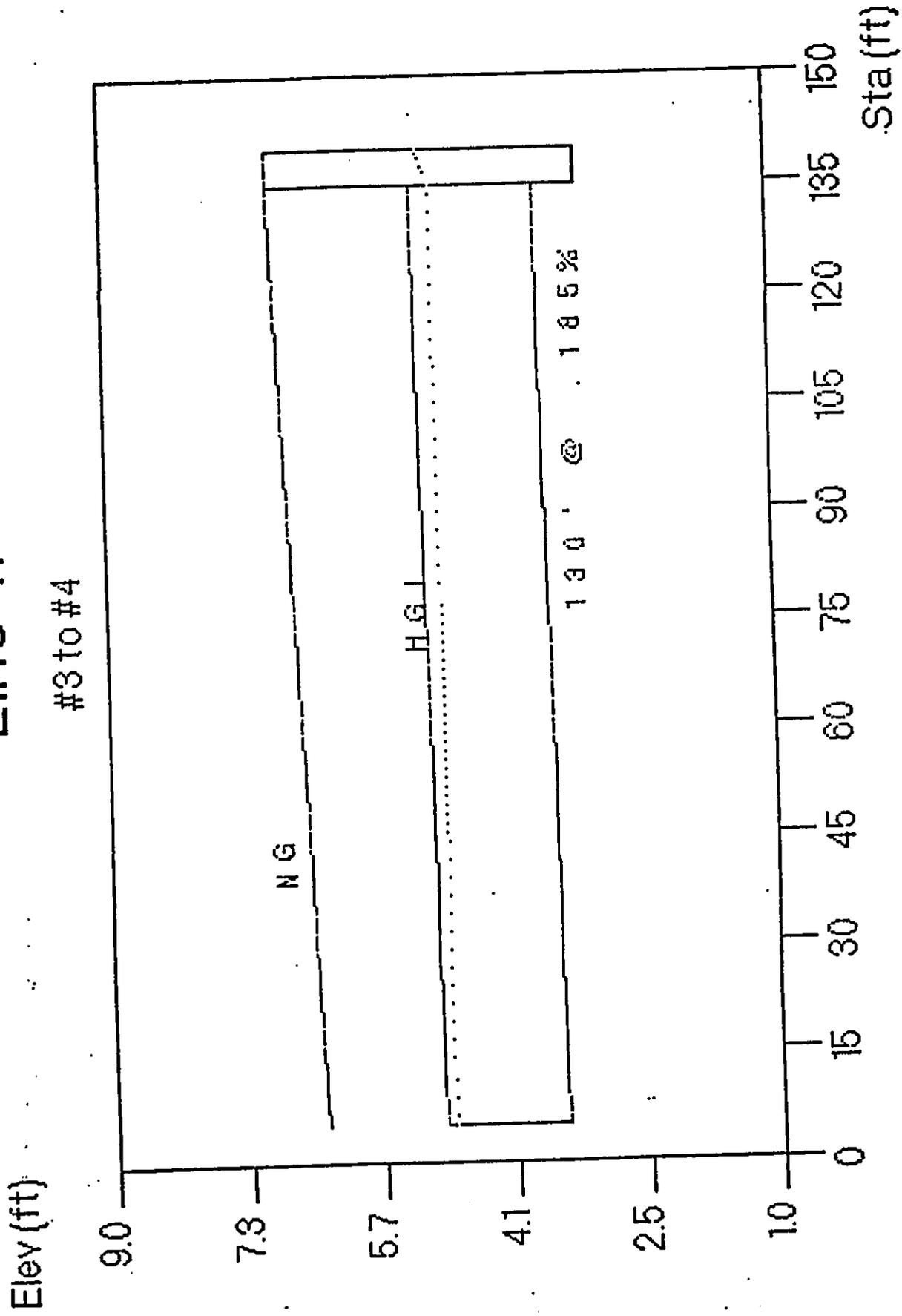
Line 10

#4 to #5



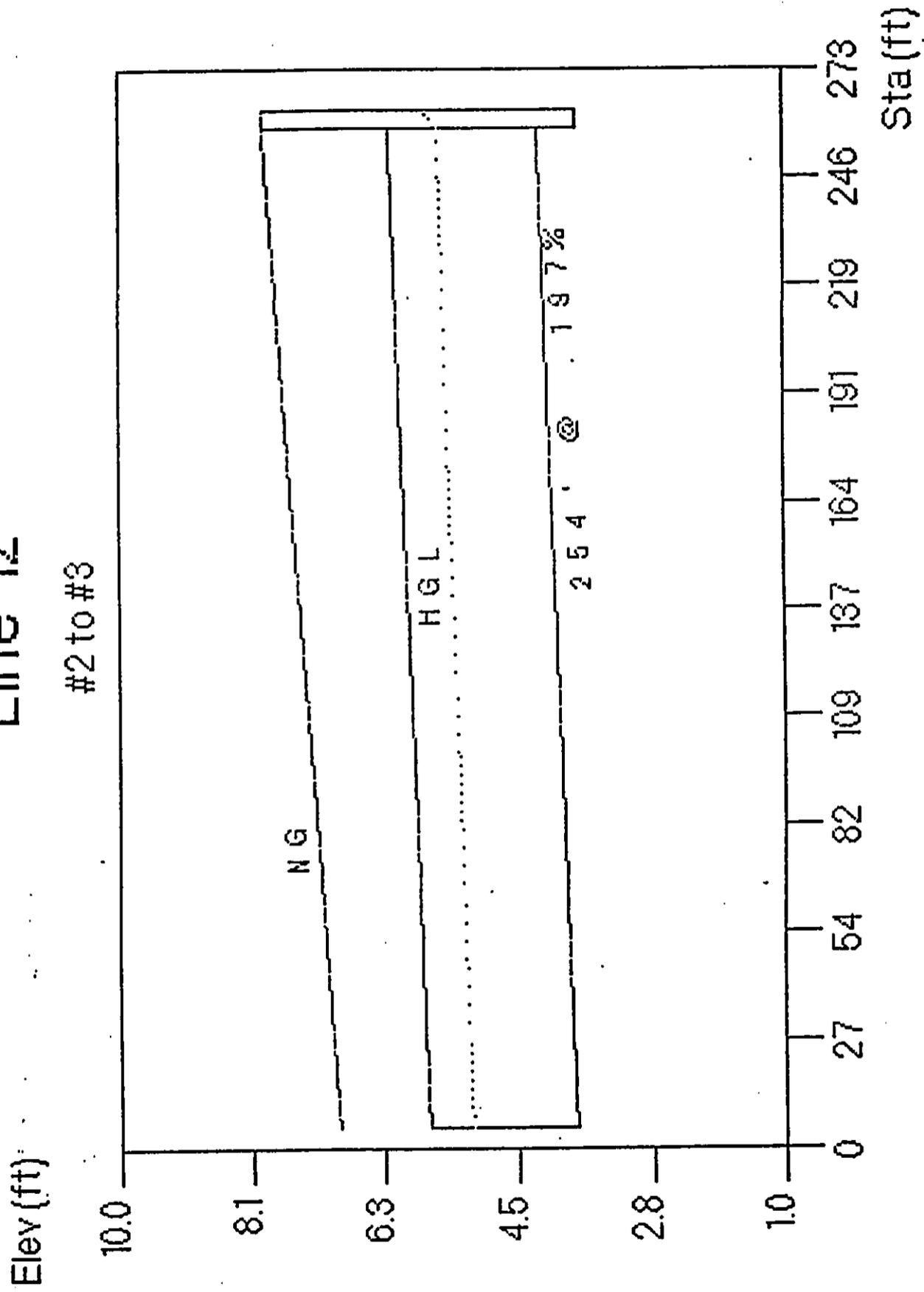
Line 11

#3 to #4



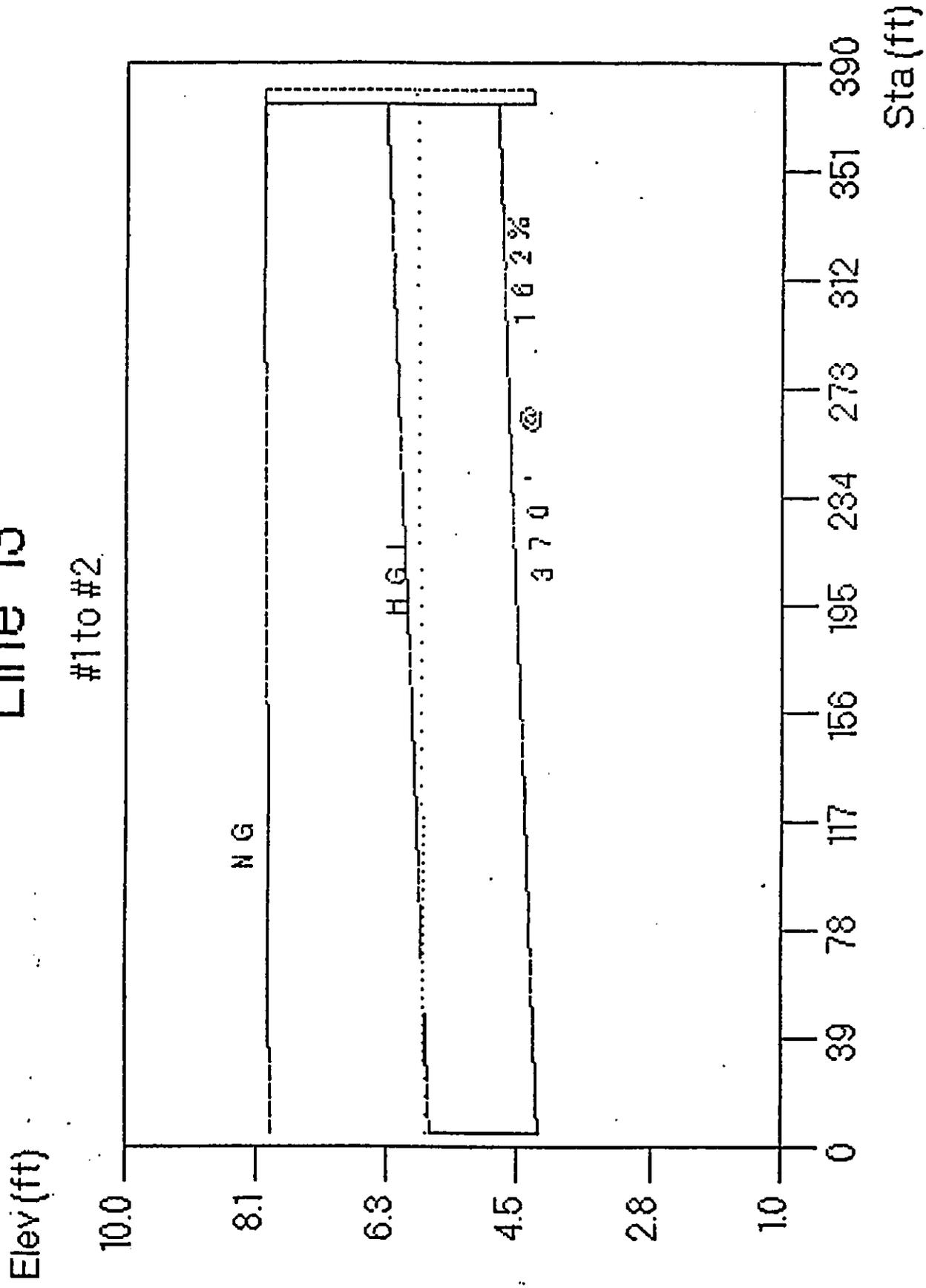
Line 12

#2 to #3



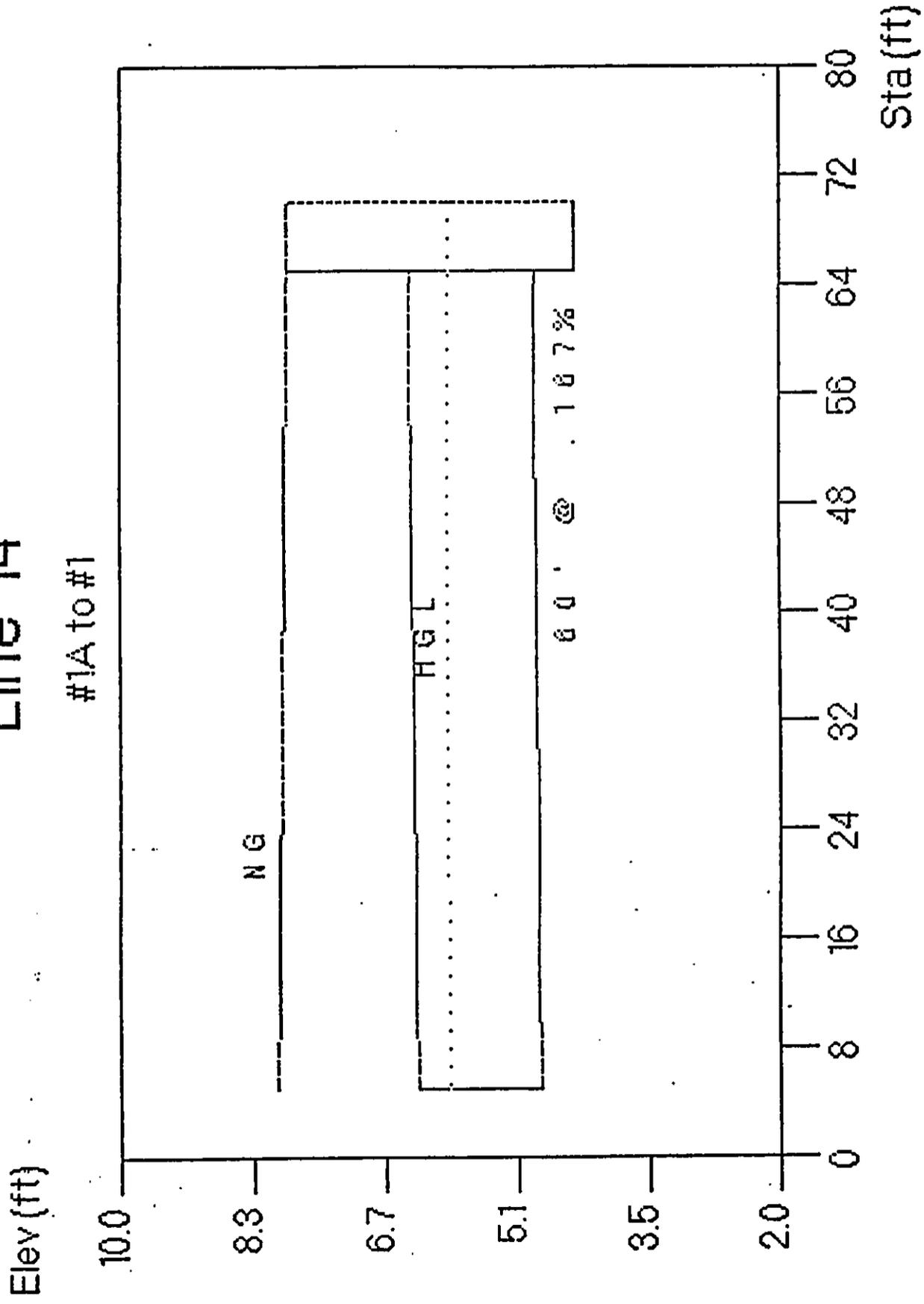
Line 13

#1 to #2



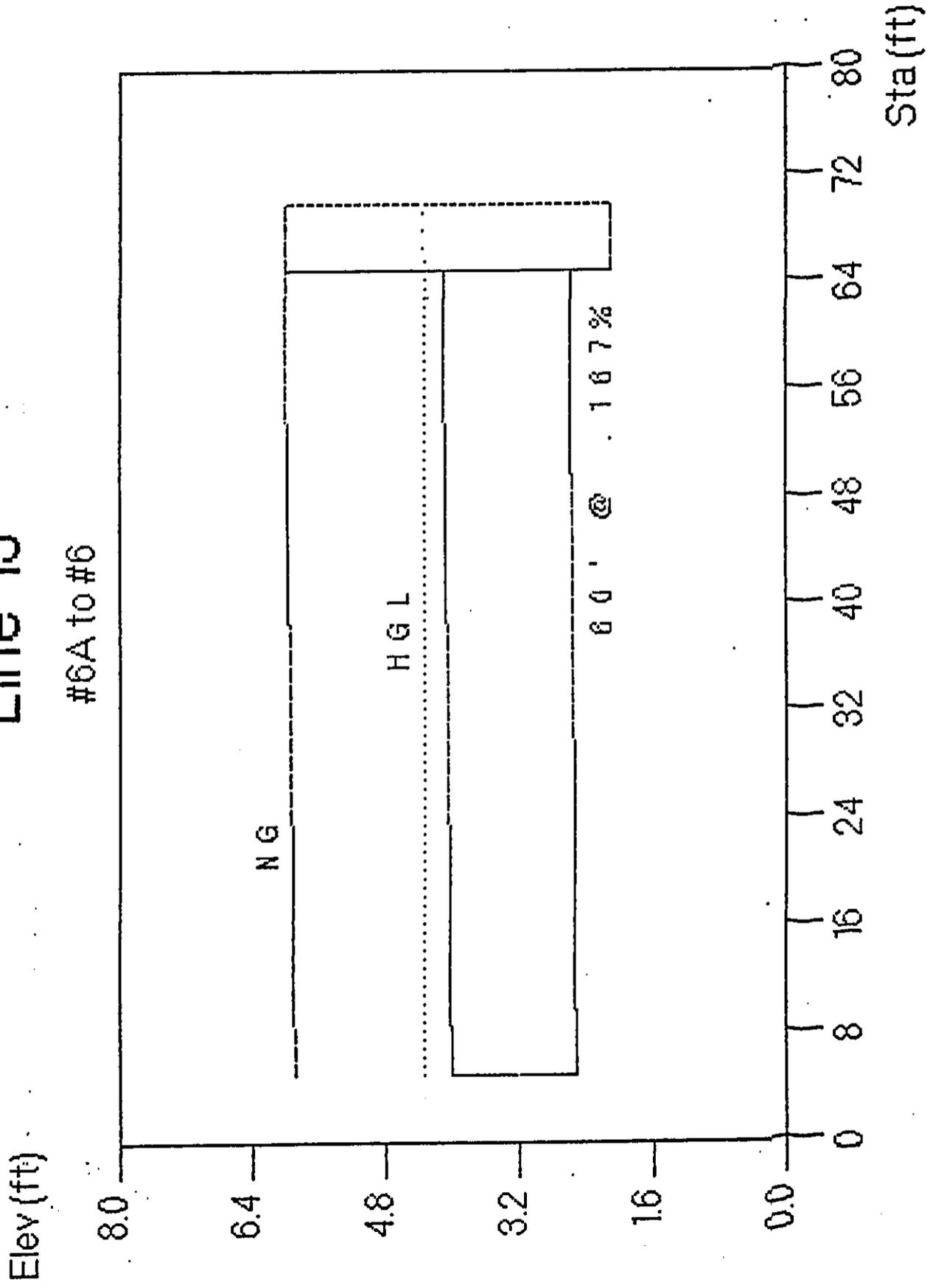
Line 14

#1A to #1



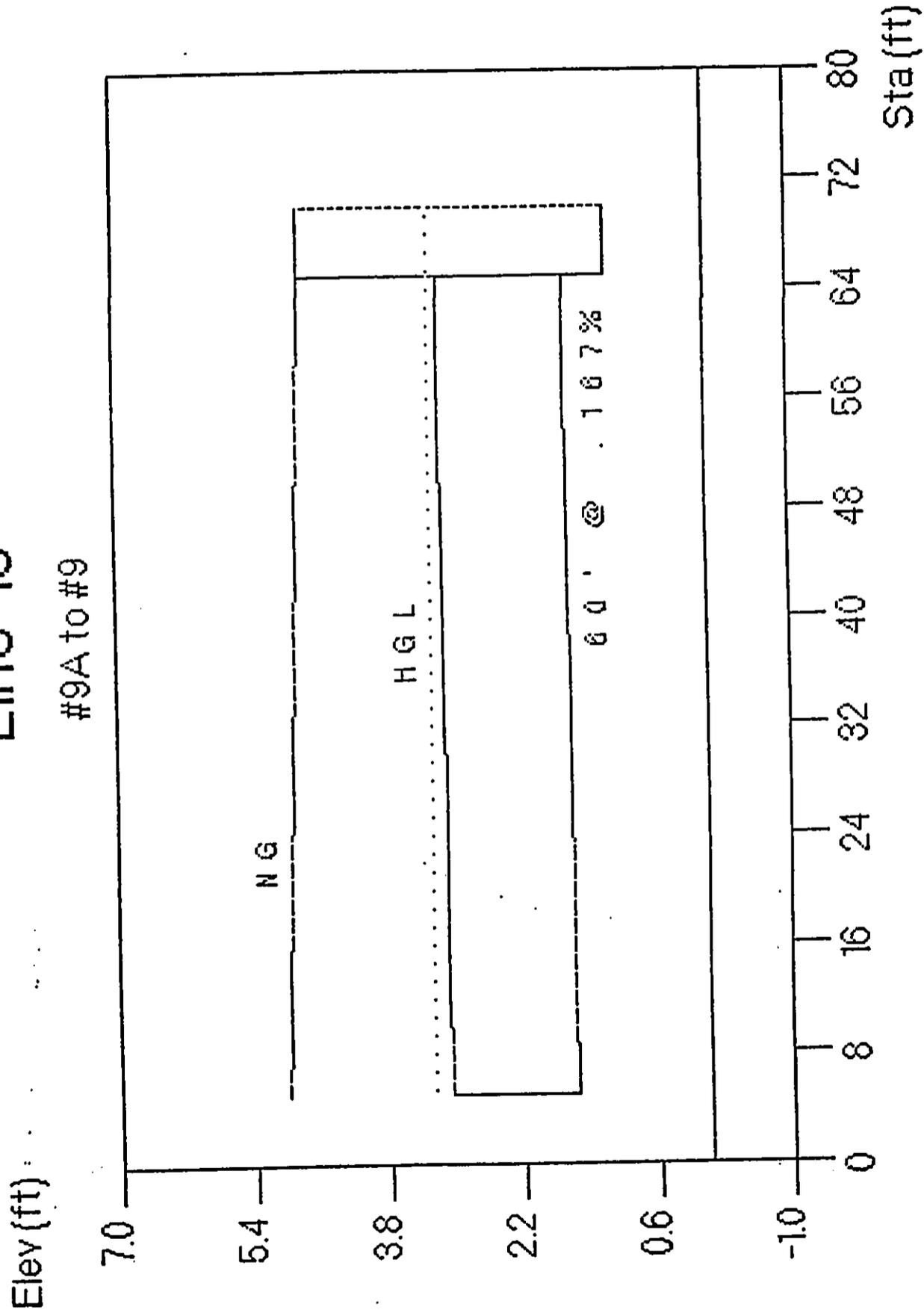
Line 15

#6A to #6



Line 16

#9A to #9



APPENDIX "C"

NOISE SURVEY

Y. Ebisu & Associates

Acoustical and Electronic Engineers

1126 12th Avenue
Room 305
Honolulu, Hawaii 96816
(808) 735-1634

YEA Job #32-036
November 29, 1994

Norman Saito Engineering Consultants, Inc.
2158 Main Street, Suite 203
Wailuku, Maui, HI 96793-1671

Attention: Mr. Carl K. Takumi, P.E.

Subject: Construction Noise Study Results; South Kihei Road,
Phase II, Waimahaihai Street to Welakahao Road

SUMMARY

The future traffic noise levels in the vicinity of the proposed South Kihei Road (Phase II) Project between Waimahaihai Street and Welakahao Road in Kihei on the island of Maui, Hawaii were evaluated for their potential impacts on nearby residences and two churches. Posted vehicle speed limit on the improved section of South Kihei Road was assumed to remain at 30 MPH. The proposed improvements will shift the existing roadway centerline by varying amounts ranging from approximately 3 to 9 FT toward the west (makai). The potential traffic noise level increases at noise sensitive locations along the west side of South Kihei Road and resulting from the shift in the roadway centerline were calculated and ranged between 0.1 and 1.5 dB, which are not considered to be significant.

Unavoidable, but temporary, noise impacts will occur during the construction of the proposed project, particularly during the earthwork activities on the project site. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment is recommended as a standard mitigation measure. Use of the existing construction noise permitting and curfew procedures of the State Department of Health noise regulations, which are applicable on the island of Oahu, are also recommended to minimize construction noise impacts at nearby church and residential properties during the construction period.

DISCUSSION OF POTENTIAL NOISE IMPACTS AND POSSIBLE MITIGATION MEASURES

Traffic Noise. Current traffic noise levels along South Kihei Road do not exceed the Federal Highway Administration (FHWA) noise standard of 67 dB average noise level during the peak hour of traffic at existing noise sensitive structures along the section of South Kihei Road between Waimahaihai Street and Welakahao

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Road. Traffic noise levels were measured during the midday period from 1000 to 1300 hours at a distance of 50 FT from the centerline of South Kihei Road at Location "A" where shown in FIGURE 1. Comparisons of the measured traffic noise levels with those predicted by the FHWA highway noise model were considered to be good and are shown in TABLE 1.

Based on the existing two-way traffic volume of 1,537 vehicles per hour along South Kihei Road during the PM peak hour, the existing average traffic noise level during the PM peak hour is approximately 64.9 dB at 50 FT setback distance from the roadway centerline. At 50 FT setback distance from the roadway centerline, existing traffic noise levels are less than the FHWA noise standard of 67 dB. Within approximately 36 FT from the roadway centerline, existing traffic noise levels exceed the FHWA noise standard of 67 dB. No existing dwelling unit is located within this critical 36 FT distance from the centerline of South Kihei Road.

Average traffic noise levels are predicted to increase by 0.1 to 1.5 dB at the existing noise sensitive structures on the west side of the project site as a result of the shift in the roadway centerline toward the west following the widening improvements. Average traffic noise levels on the east (mauka) side of the project site are predicted to decrease by 0.3 to 1.2 dB as a result of this shift in the roadway centerline. These changes in traffic noise will be difficult to detect, and are not considered to be significant. The shift in the roadway centerline should not cause existing traffic noise levels to exceed the FHWA noise standard of 67 Ldn at existing noise sensitive structures along the project corridor.

General Construction Noise. Audible construction noise will probably be unavoidable during the entire project construction period. The total time period for construction is unknown. Because the excessively noisy work may move from one location on the project site to another during that period, actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. Typical levels of exterior noise from construction activity (excluding pile driving and jack hammering activity) are shown in FIGURE 2. Typical levels of construction noise inside naturally ventilated and air conditioned structures are approximately 10 and 20 dB less, respectively, than the levels shown in FIGURE 2.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 to 90+ dB at 50 FT distance), and due to the exterior nature of the work (jack hammering, grading and earth moving, concrete pouring, hammering, etc.). The use of properly

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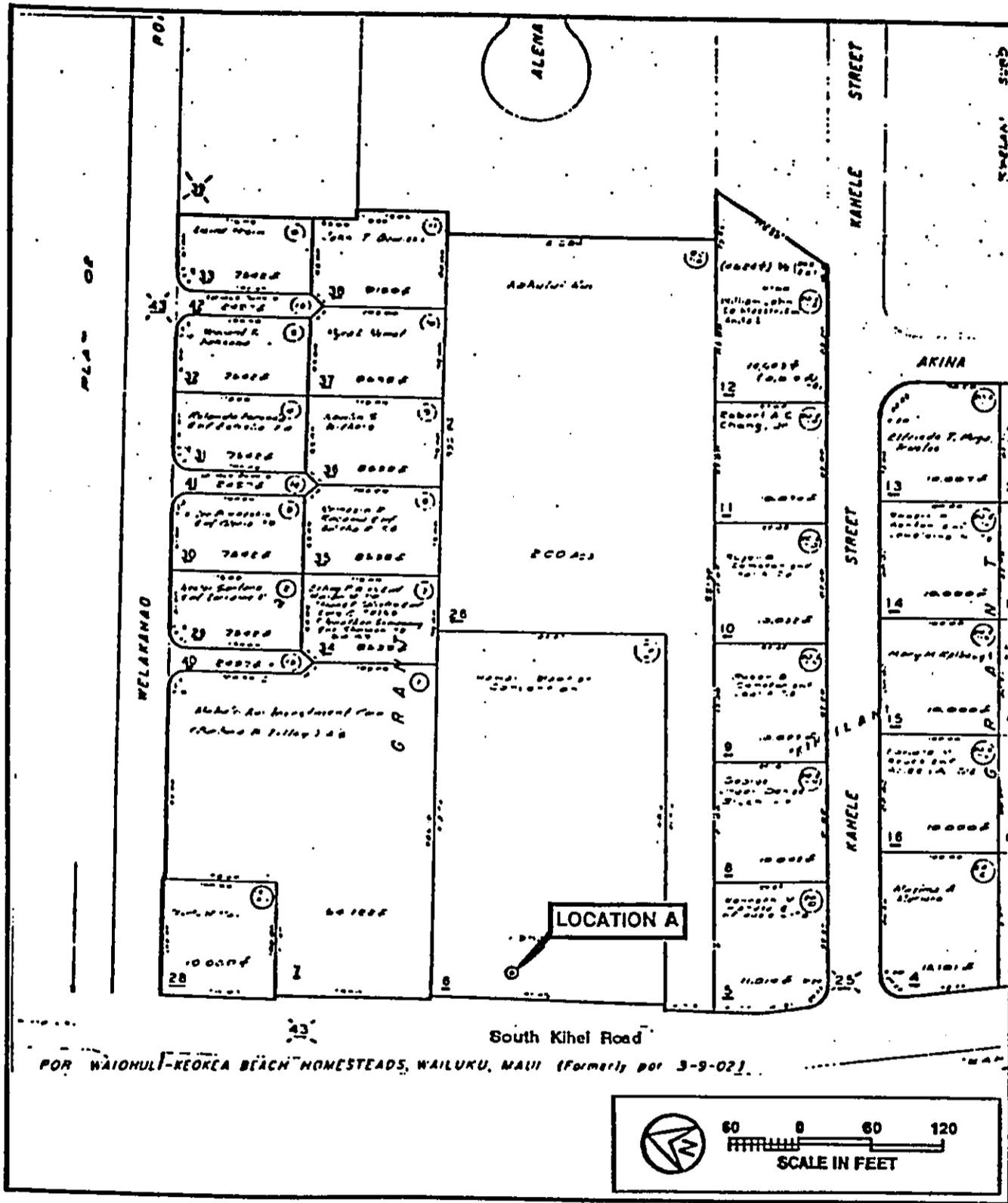
muffled construction equipment should be required on the job site. The dwelling unit closest to the project site may experience construction noise levels of 90+ dB during the earthwork phase of the project.

The incorporation of State Department of Health construction noise limits and curfew times, which are applicable on the island of Oahu ("Title 11, Administrative Rules, Chapter 43, Community Noise Control for Oahu;" Hawaii State Department of Health; November 6, 1981), are other noise mitigation measures which are normally applied to construction activities when noise sensitive receptors are involved. TABLE 2 depicts the allowed hours of construction for normal construction noise (levels which do not exceed 95 dB at the project's property line) and for construction noise which exceeds 95 dB at the project's property line. Operation of close-in heavy diesel equipment and jack hammering activities are generally included within the second category whose noise levels could exceed 95 dB at the property line. Excessively noisy construction activities, such as jack hammering, are not allowed on holidays, Saturdays, Sundays, during the early morning, and during the late evening periods under the DOH permit procedures.

The use of 6 to 8 FT high plywood construction barriers along the project corridor can reduce construction noise levels by 5 to 10 dB. The use of these barriers is recommended where feasible.



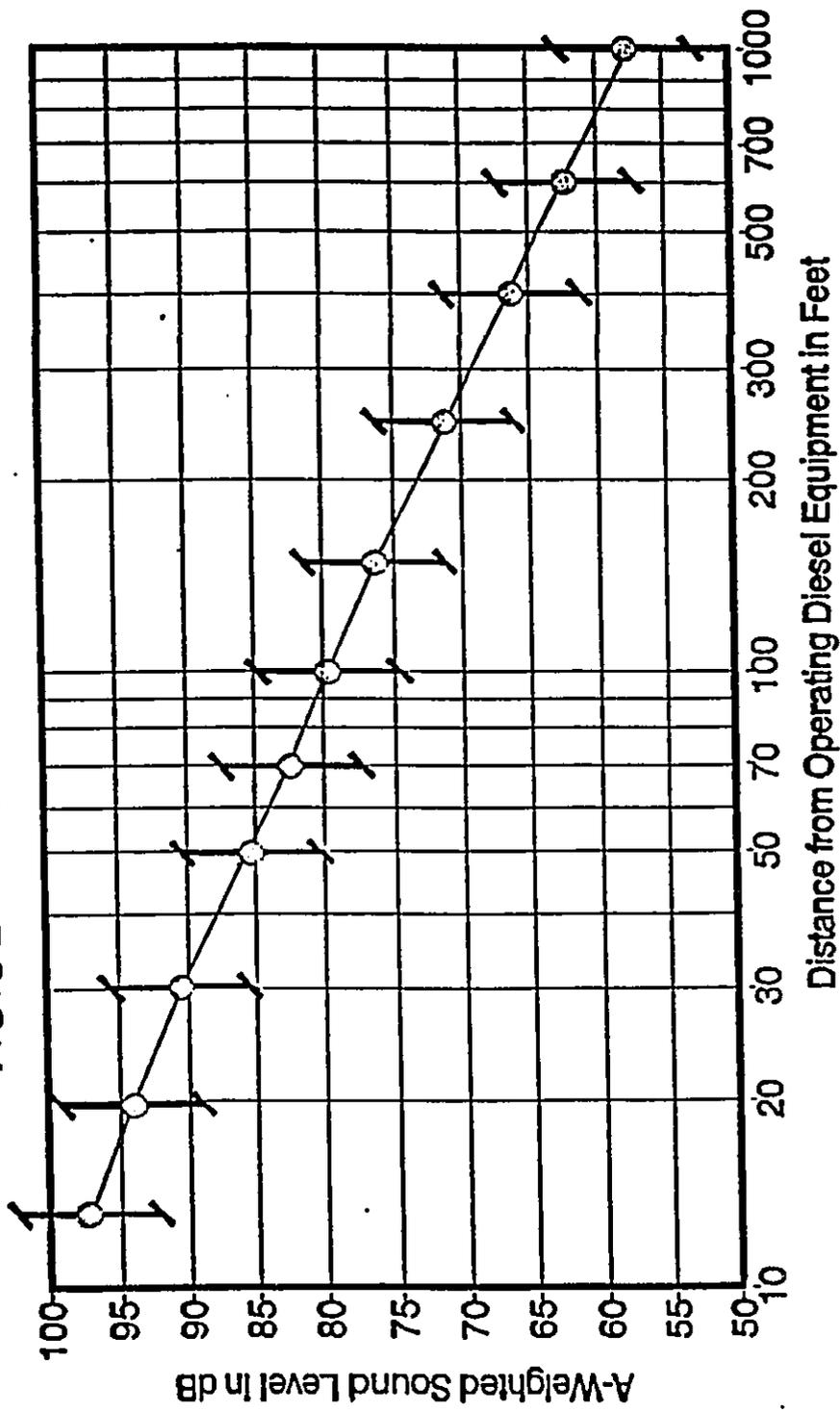
Yoichi Ebisu, P.E.



LOCATION OF NOISE MEASUREMENT SITE "A"

FIGURE 1

ANTICIPATED RANGE OF CONSTRUCTION
NOISE LEVELS VS. DISTANCE



CONSTRUCTION NOISE LEVELS VS. DISTANCE

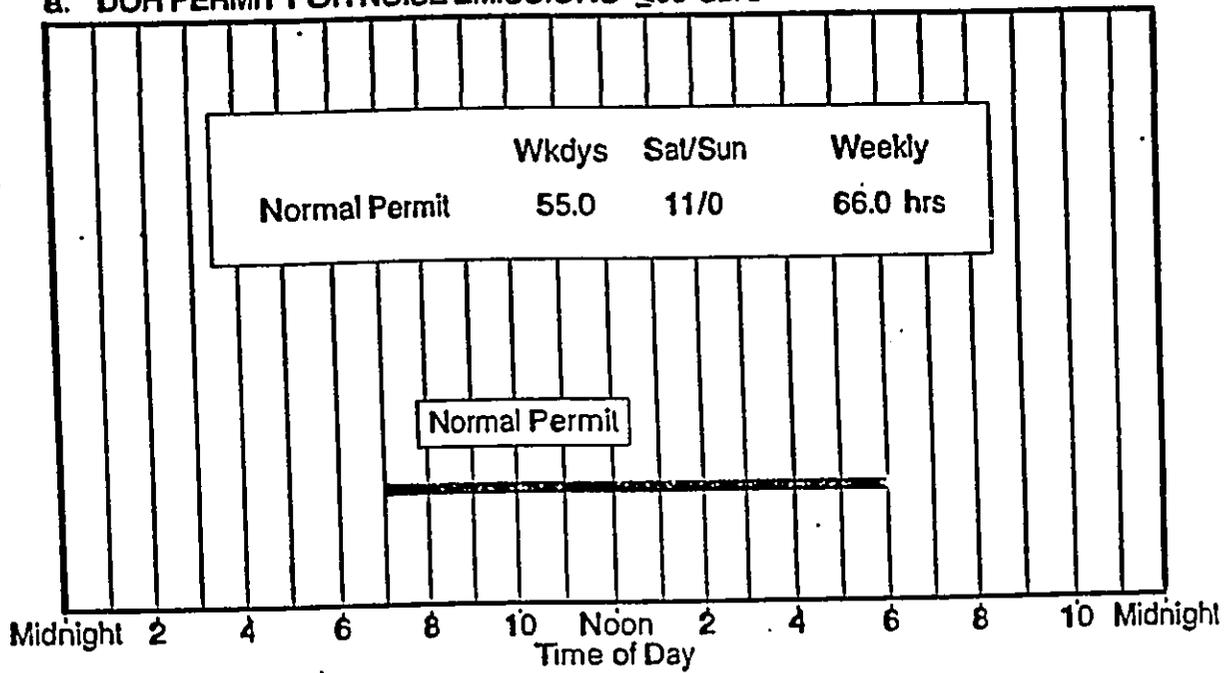
FIGURE
2

TABLE 1
NOISE MEASUREMENT RESULTS

<u>LOCATION</u>	<u>Time of Day</u> <u>(HRS)</u>	<u>Ave. Speed</u> <u>(MPH)</u>	<u>--Hourly Traffic Volume--</u>		<u>Measured</u> <u>Leq (dB)</u>	<u>Predicted</u> <u>Leq (dB)</u>
			<u>AUTO</u>	<u>M.TRUCK</u> <u>H.TRUCK</u>		
A. 50 FT from the center- line of S. Kihei Rd. (11/17/94)	1000 TO 1100	35	1,338	22	64.6	64.5
A. 50 FT from the center- line of S. Kihei Rd. (11/17/94)	1155 TO 1255	35	1,331	14	64.3	64.5

TABLE 2
AVAILABLE WORK HOURS UNDER DOH
PERMIT PROCEDURES FOR CONSTRUCTION NOISE

a. DOH PERMIT FOR NOISE EMISSIONS ≤ 95 dBA



b. DOH PERMIT FOR NOISE EMISSIONS > 95 dBA.

