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KUUIPO RESORT CONDOMINIUMS

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The State of Hawaii
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- Section H: Permit Applications

PLANNING DEPARTMENT

County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

AUG 27 1979

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PLANNING DEPARTMENT
COUNTY OF HAWAII
HILO, HAWAII 96720

KUUIPO RESORT CONDOMINIUMS

SUMMARY SHEET

This report will outline, detail, and summarize the total impact that Kuuipo Resort Condominiums will have on the ecosystem of Hilo, Hilo Bay, and Hawaii County. This report will demonstrate through maps, aerial photographs, topographic maps, and consultation with the Hawaii County General Plan, engineers, surveyors, economists that Kuuipo Resort Condominiums will have an overall beneficial effect to the neighborhood, the City of Hilo, and the County.

KUUIPO RESORT CONDOMINIUMS OBJECTIVES

The development will support several policies of the Hawaii County General Plan. One policy in the Economic sector of the Plan stresses that the "County is to implement programs to revitalize downtown Hilo."¹ There can be no better method of revitalization than the introduction of a large construction project with its concomitant infusion of new capital, new employment, purchasing power, future jobs and new ideas. Located at the Northeast corner of the Wailuku River and Puueo Street, the development is only a block away from downtown Hilo, thus assuring that its residents and patrons will spend their money downtown and have a direct influence on the development of downtown Hilo.

Several policies under the Natural Resources and Shoreline headings support the development:

1. One policy is to prevent land erosion and to maintain the beauty of the environment. Construction of a seawall along the river bank will prevent further land erosion and will aid in the complete development in harmony with the environment.
2. A second policy is the fulfillment of recreational needs which would provide maximum benefit to the public. The reinforced northern river bank will open new fishing areas to public access. At present fishing is primarily being done from the south bank of the Wailuku River.
3. A third policy is to "investigate methods of beach replenishment and sand erosion control."³ The construction of the seawall will retard the loss of sand and, by design, beach replenishment can continue unabated.

Under Recreation a stated policy is "Public access to shoreline shall be provided ..."⁴ Kuuipo is providing public access to the frontage along the Wailuku River via the seawall. Shoreline recreation in the form of fishing, boating, and swimming will be permissible and possible once the project is completed.

Under the Plan's Course of Action for South Hilo, a strip park along both sides of the Wailuku River with pedestrian walkways along the river is stressed.⁵ The project, with

its constructed walkway, will provide such a walkway at no cost to the County and its taxpayers.

A recommended further course of action for South Hilo is to "encourage the development of an adequate small boat harbor."⁶ The restaurant's proposed boat harbor, although a requested but not mandatory requirement of the project will ensure the fulfillment of that course of action. The developers will build the small boat landing at no cost to the County and have offered to turn over the harbor to the County, once it is completed.

Under the Transportation guideline and in consideration of the increasing cost of fuel, Kuuipo, located just one block from downtown Hilo, will discourage the wasteful use of precious fuel for shopping, banking, entertainment, and dining.

The Land Use section mentions that presently zoned land be developed first to discourage speculative zoning. The subject property is already zoned V-750 (Resort/Hotel). Although 100 units are permissible under this zoning, the project consists of only 75 units, thus providing lower density and higher square footage per unit.

A further policy is that new projects be serviced by basic community facilities and utilities. Kuuipo will make full use of such facilities as water, electricity, sewer utilities and transportation and recreation facilities.

Under the subheading of Resort, the County is to encourage development of such existing zoning and to follow the General

Plan. The project is on Resort zoned land and the area is slated for Resort in the General Plan.

In summary, the development of Kuuipo meets the major policies, statements, conditions, and requirements of the General Plan for Hawaii County.

SITE DESCRIPTION

Kuuipo Resort Condominiums are located on the north bank of the Wailuku River and are bordered by Puueo Street, Kou Lane, and the Hawaii Belt Highway. Its natural surroundings consist of heavy underbrush, bamboo trees, and thick shrubbery. Abandoned cars, chicken coops, trash burnings, and some private gardens are now located among the shrubbery. To the north are apartments and old plantation houses, serving as rental units.

The economic area is in transition with single family homes rented out in anticipation of further multiple family developments. Across Puueo Street is an FHA subsidized housing project. Diagonally across the corner is an old, dilapidated store in need of much repair and cleaning. There are a few apartments nearby of reasonable quality.

Being in close proximity to downtown Hilo, the residents and customers will not have far to travel and pedestrian or bicycling will be encouraged as the recommended means of transportation.

SPECIFICS OF THE PROJECT

Kuuiipo Resort Condominiums are designed for beauty, practicality, and harmonious blending with their environment. Although 100 units are permitted, the planned 75 condominiums will ensure a low density development. Each unit will have a scalloped shell balcony and in profile the building will resemble a pyramid at a slope identical to the existing 30 percent slope of the property. With its earth colors, extensive landscaping both throughout the balconies and grounds, and the native lava rock bank, the buildings will blend into the landscape unobtrusively and attractively.

The Kuuiipo development will be enhanced with open space provided by its wide 50-foot setbacks from the property lines. Being ten stories high, with just six stories showing above Puueo Street line, the building will appear to be only a six-story structure from the street. All parking will be underground, out of sight and sound from its neighbors. There will be 150 parking spaces.

Although visible from the Belt Highway, access to both projects will be only from Puueo Street and Wailuku River, if the small boat harbor is approved.

The economics of the project will show that it will bring six to seven million dollars into the local economy in construction jobs, materials, and taxes. If all approvals are obtained, Kuuiipo should commence construction in the Fall of 1979.

PROJECT DESCRIPTION

Kuuiipo will be ten terraced stories of scalloped, balconied units. Only six stories will be seen above Puueo Street. With the building starting over the 12-foot elevation, it will be above the tsunami zone architectural control. Being of natural earth colors with a lava rock bank, Kuuiipo's view will be spectacular both to the residents and the onlookers. Its residents and patrons will have a sweeping panoramic view of Hilo Bay and downtown Hilo.

The building's slope line will follow the present 30 percent slope line of the bank. Any variance required such as the ingress and egress rampways will be in the setback area. The parcel, however, is zoned for ten stories.

UNAVOIDABLE IMPACT

During construction there will be some traffic congestion and noise but they will be of short duration in relation to the permanent benefits of architectural beauty, jobs, and generation of local taxes.

Once completed, there will be additional traffic but not of such magnitude as to overload the designed capacity of the present streets.

FOOTNOTES:

¹The General Plan, County of Hawaii, State of Hawaii, December 15, 1971,
pg. 12.

²Ibid, pg. 17.

³Ibid, pg. 43.

⁴Ibid, pg. 63.

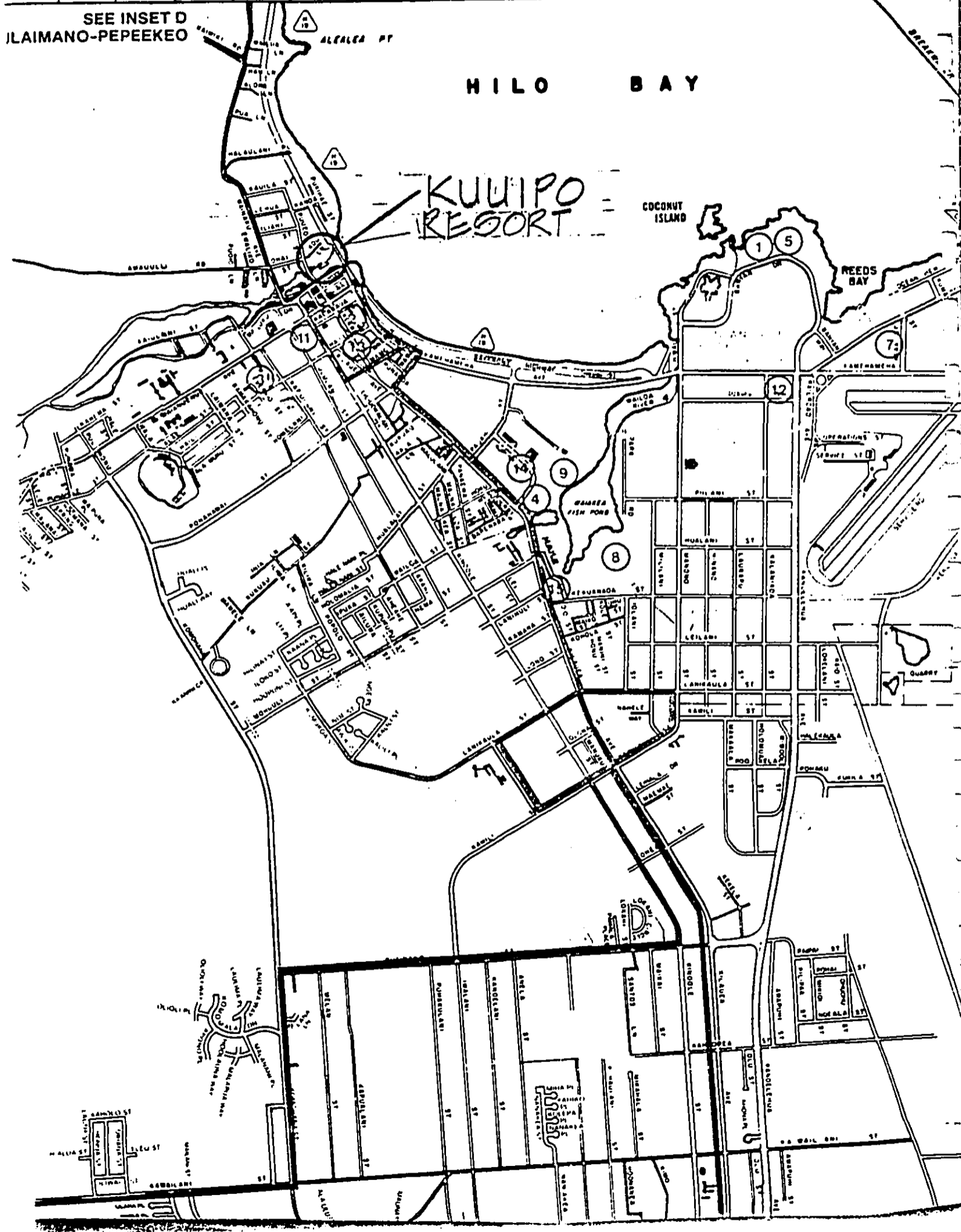
⁵Ibid, pg. 65.

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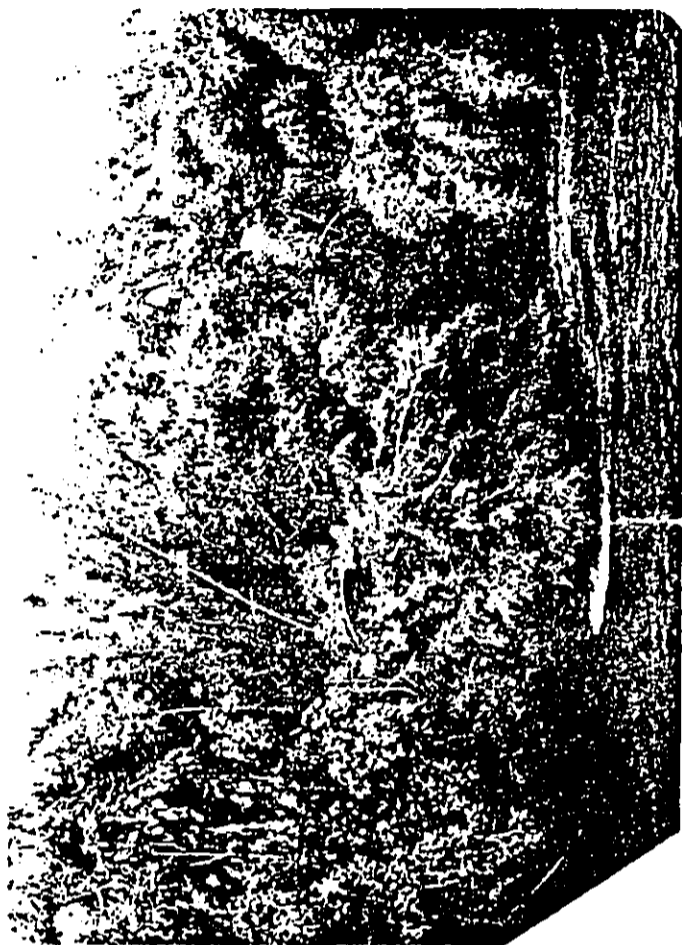
SEE INSET D
ILAIMANO-PEPEKEO

HILO BAY

KULIPO RESORT



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PROPERTY LOOKING FROM ACROSS
WAILUKU RIVER.



SHERATION MAHI



PROPERTY LOOKING FROM ACROSS
WAILUKU RIVER.



VIEW OF BAY FROM
MIDDLE OF PROPERTY

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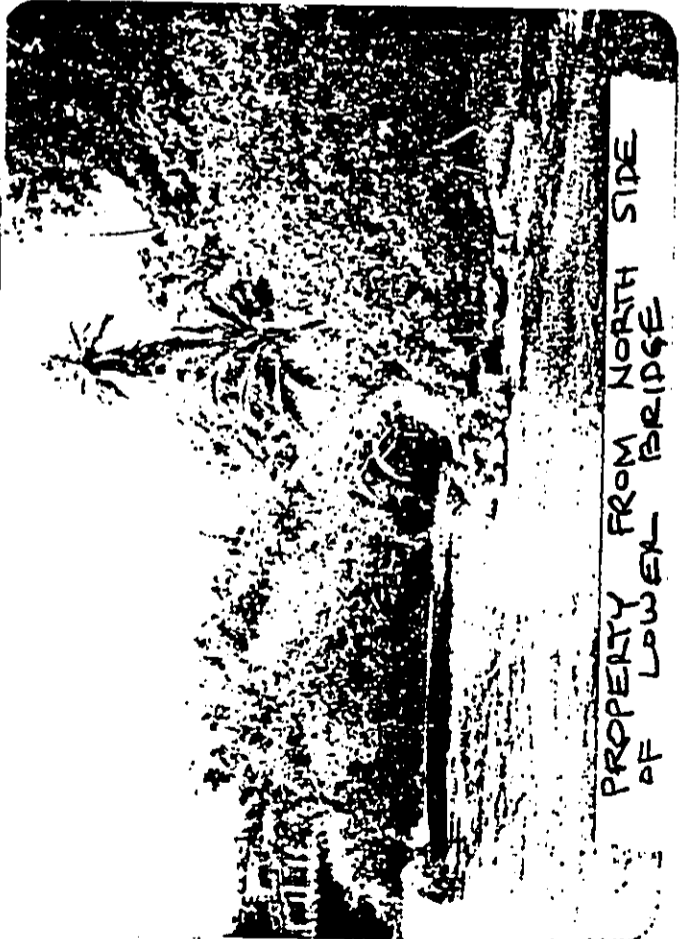
LOOKING AT PROPERTY FROM
ACROSS THE BAY BY TELEPHONE



LOOKING AT PROPERTY FROM
LOWER BRIDGE



LOOKING AT PROPERTY FROM
ACROSS THE BAY



PROPERTY FROM NORTH SIDE
OF LOWER BRIDGE

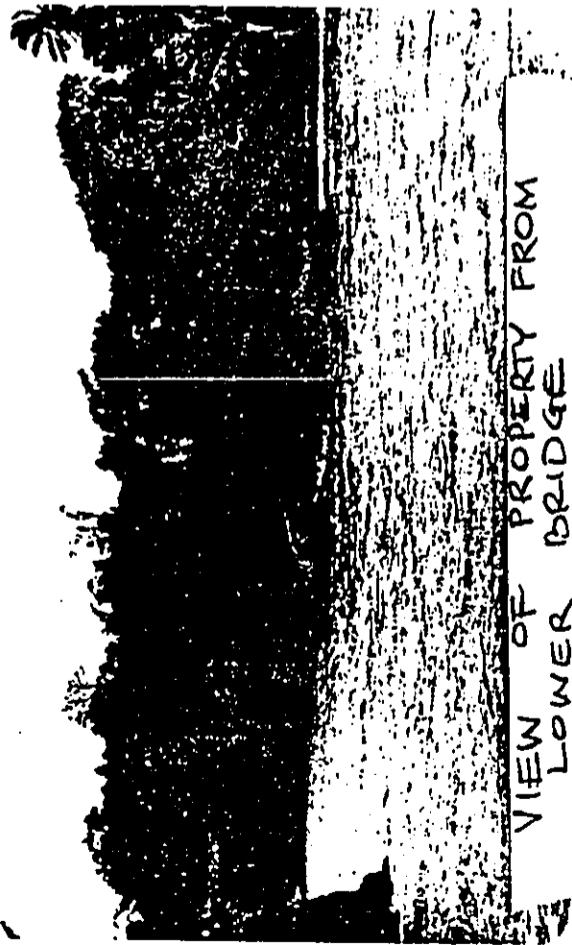
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VIEW OF PROPERTY FROM
LOWER BRIDGE



VIEW OF PROPERTY FROM
ACROSS WAILUKU RIVER

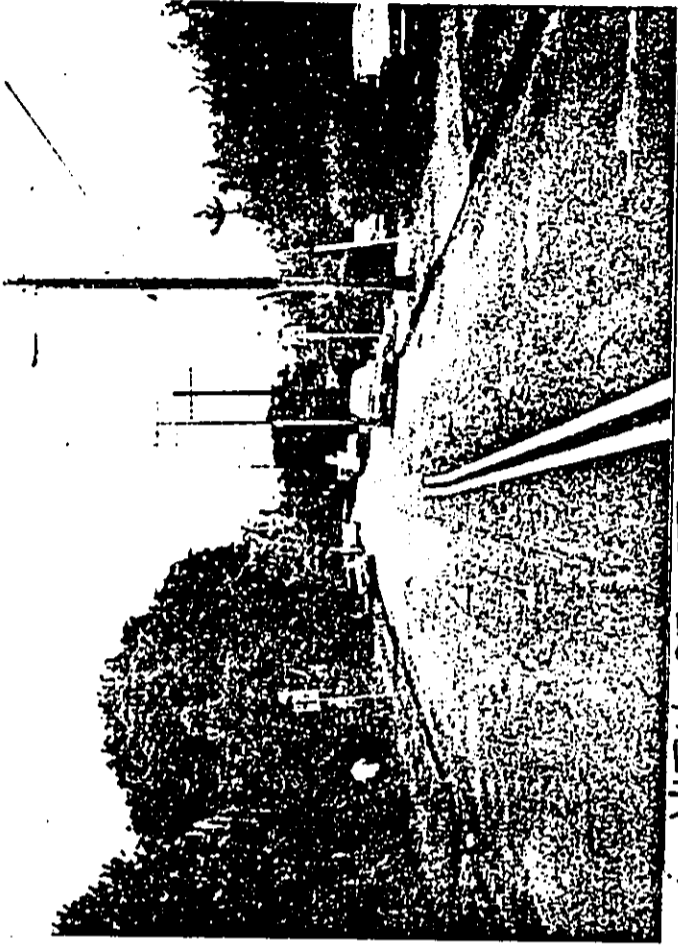


VIEW OF PROPERTY FROM
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VIEW OF PROPERTY FROM
ACROSS WAILUKU RIVER

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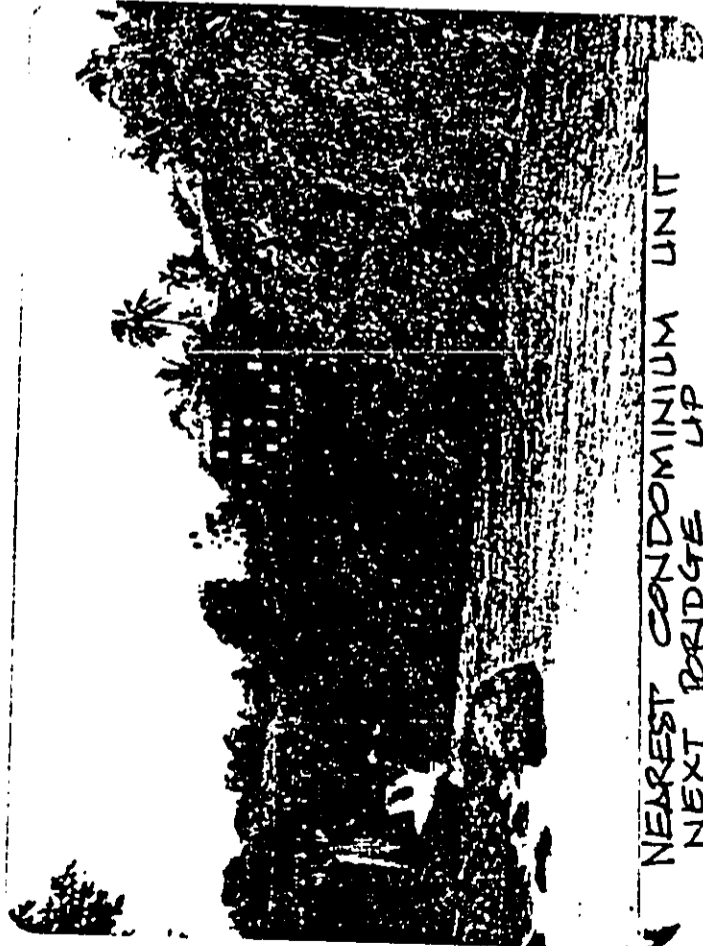
VIEW OF STREET LOOKING NORTH.



VIEW DOWN KOUL LANE AND ADJACENT TO PROPERTY.

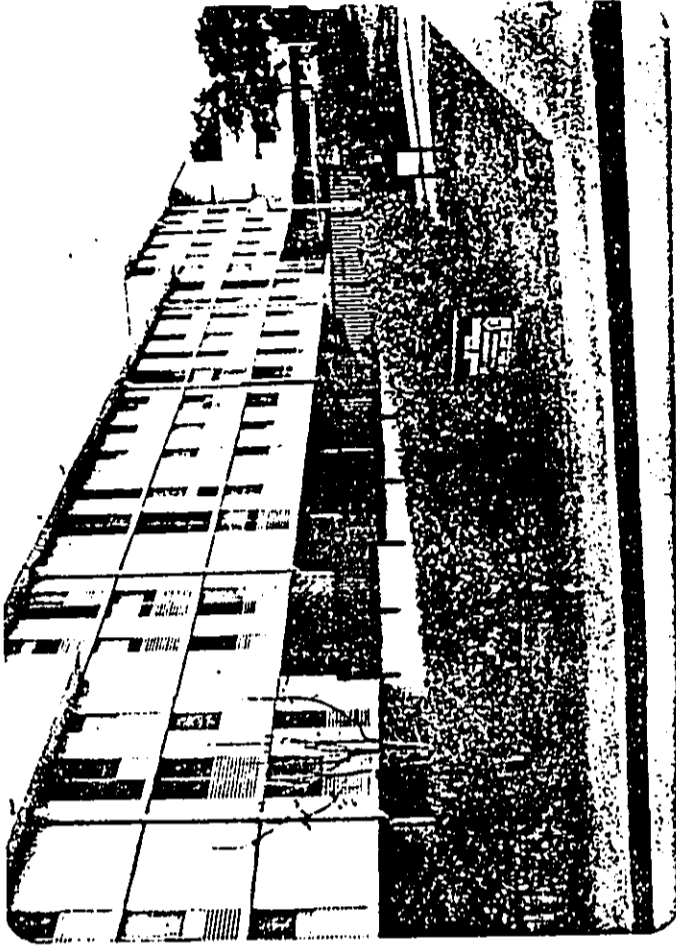


APARTMENT NEXT TO PROPERTY ON PUUEO

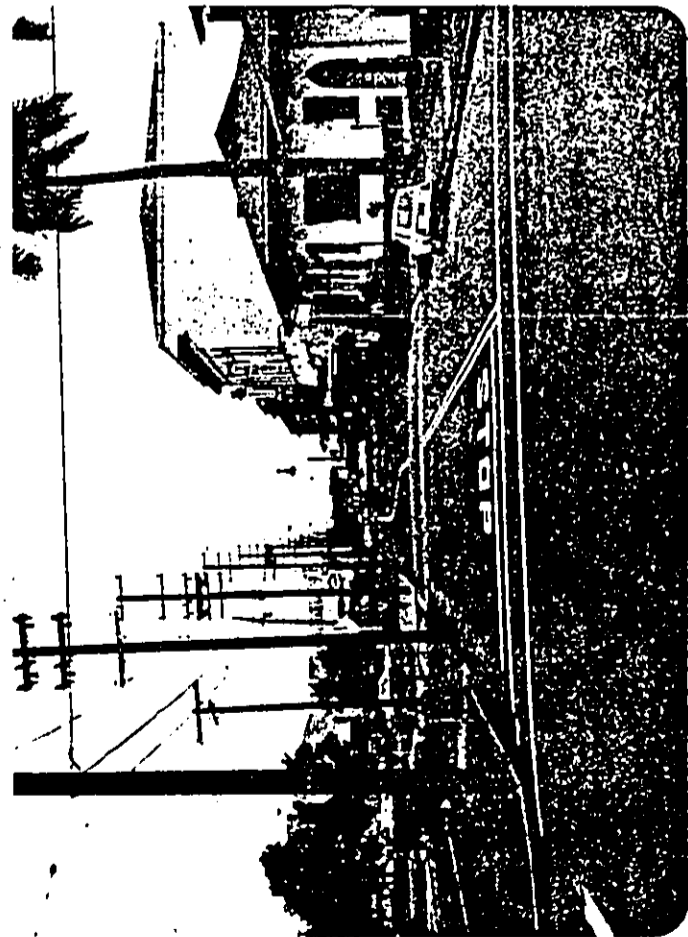
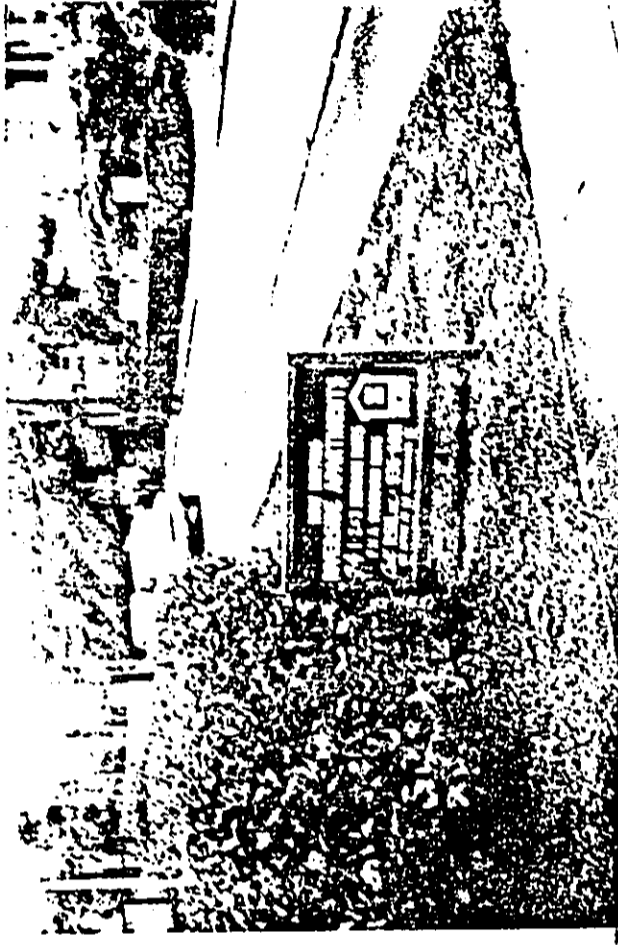


NEAREST CONDOMINIUM UNIT NEXT BRIDGE UP

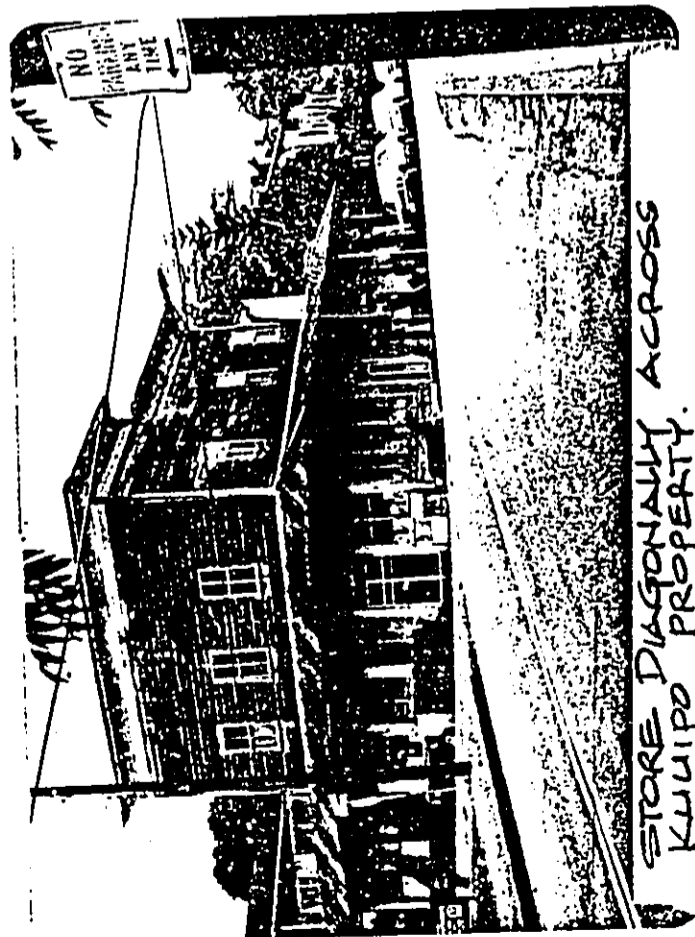
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FHA APARTMENTS LOCATED ON PUUEO STREET - ACROSS PROPERTY.

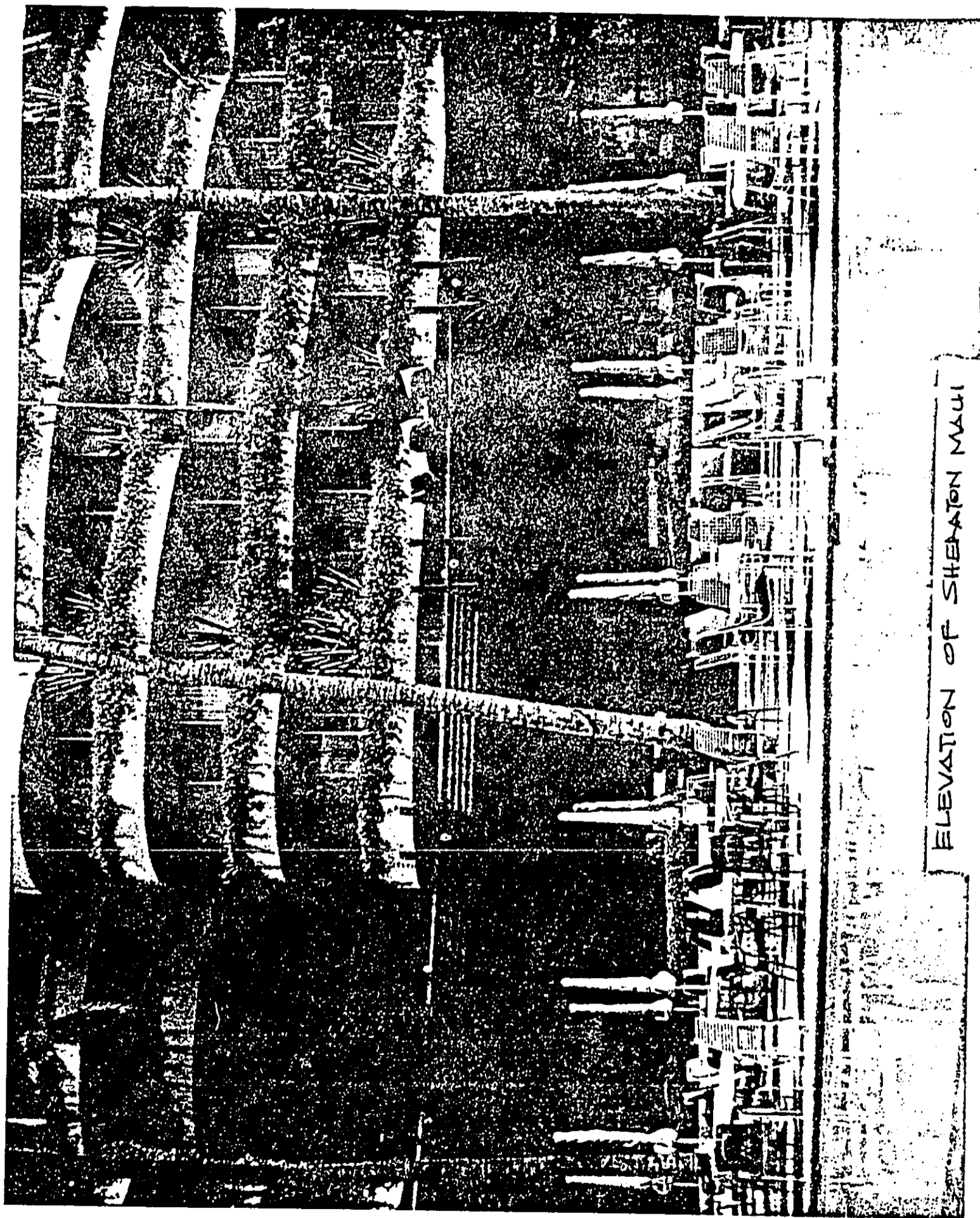


DOWN TOWN HILO - FROM PROPERTY ACROSS BRIDGE



STORE DIAGONALLY ACROSS KUIIPO PROPERTY.

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ELEVATION OF SHEARON MAUI

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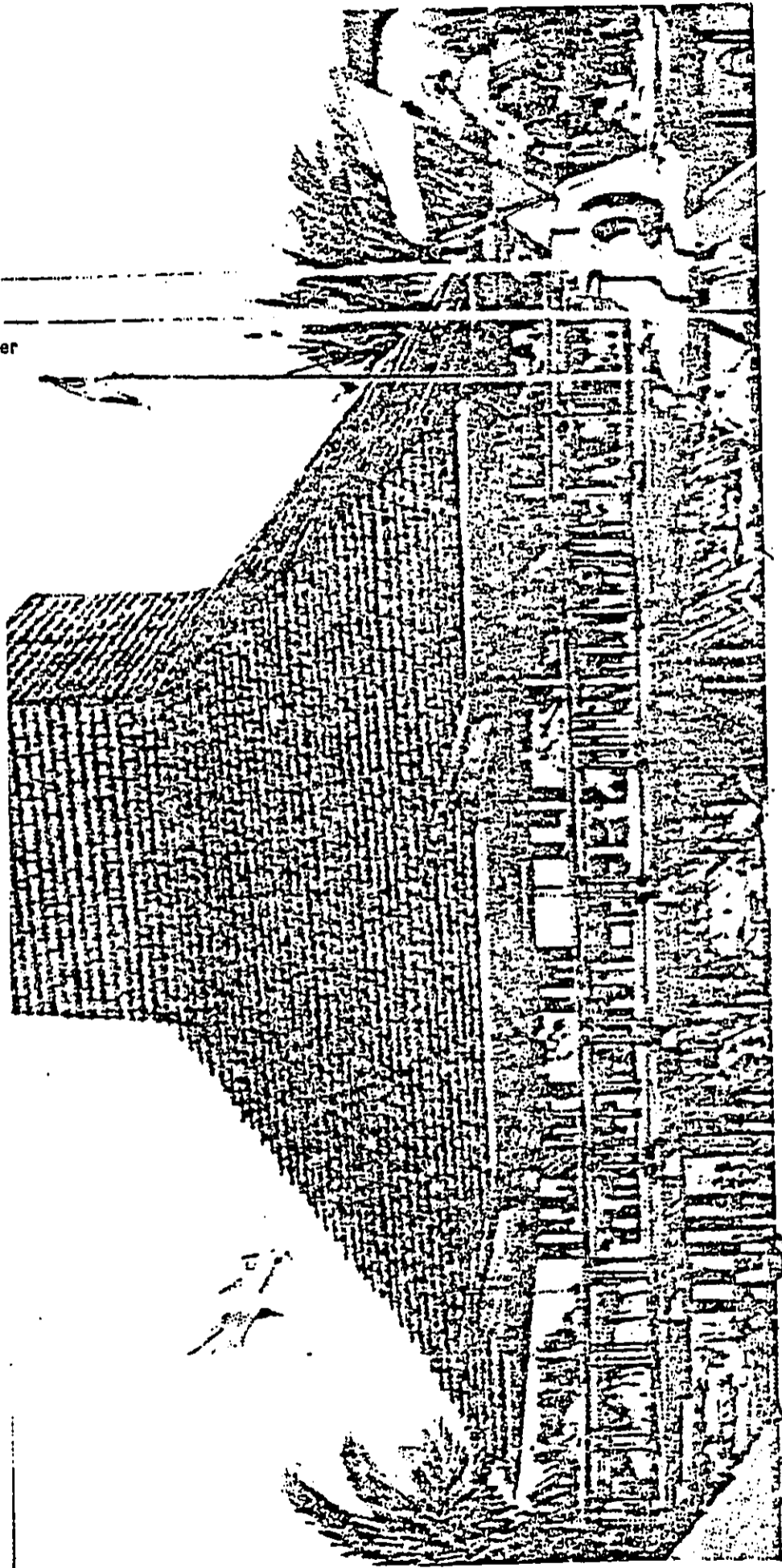
Mark Saito
Consulting Engineer



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Mark Saito
Consulting Engineer

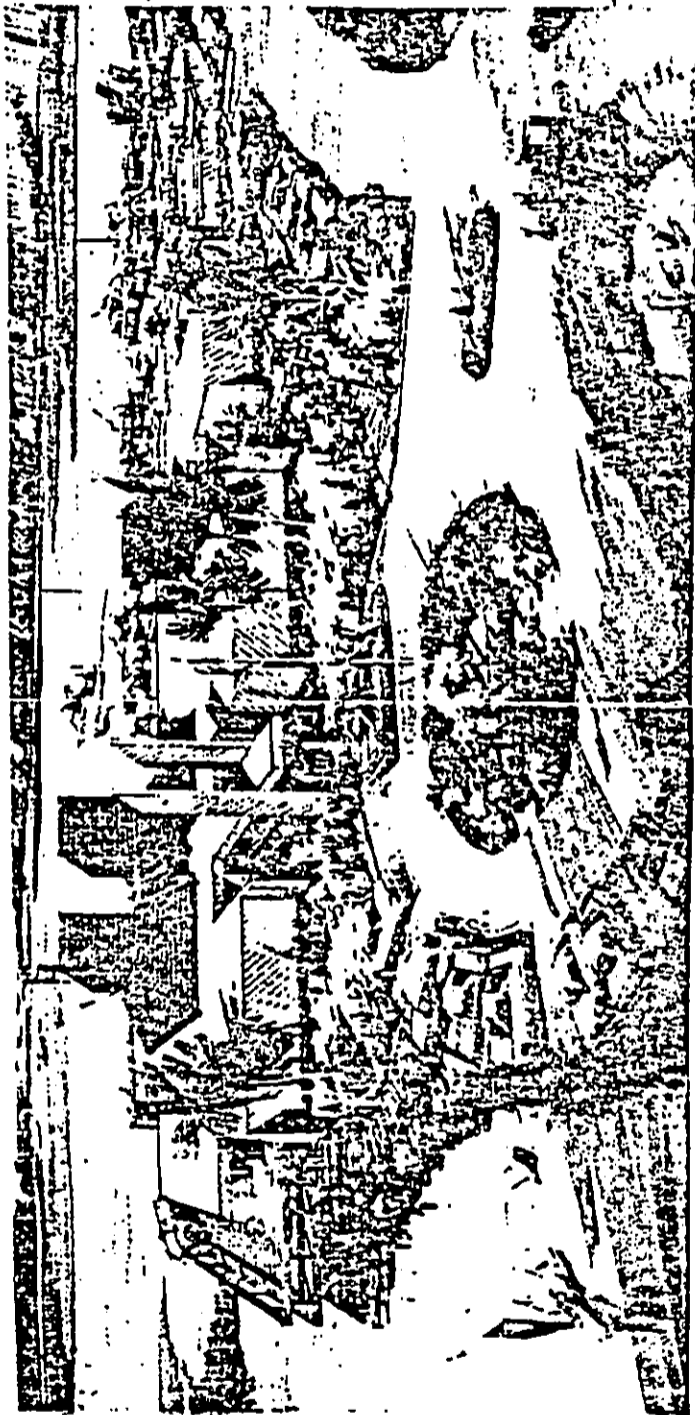


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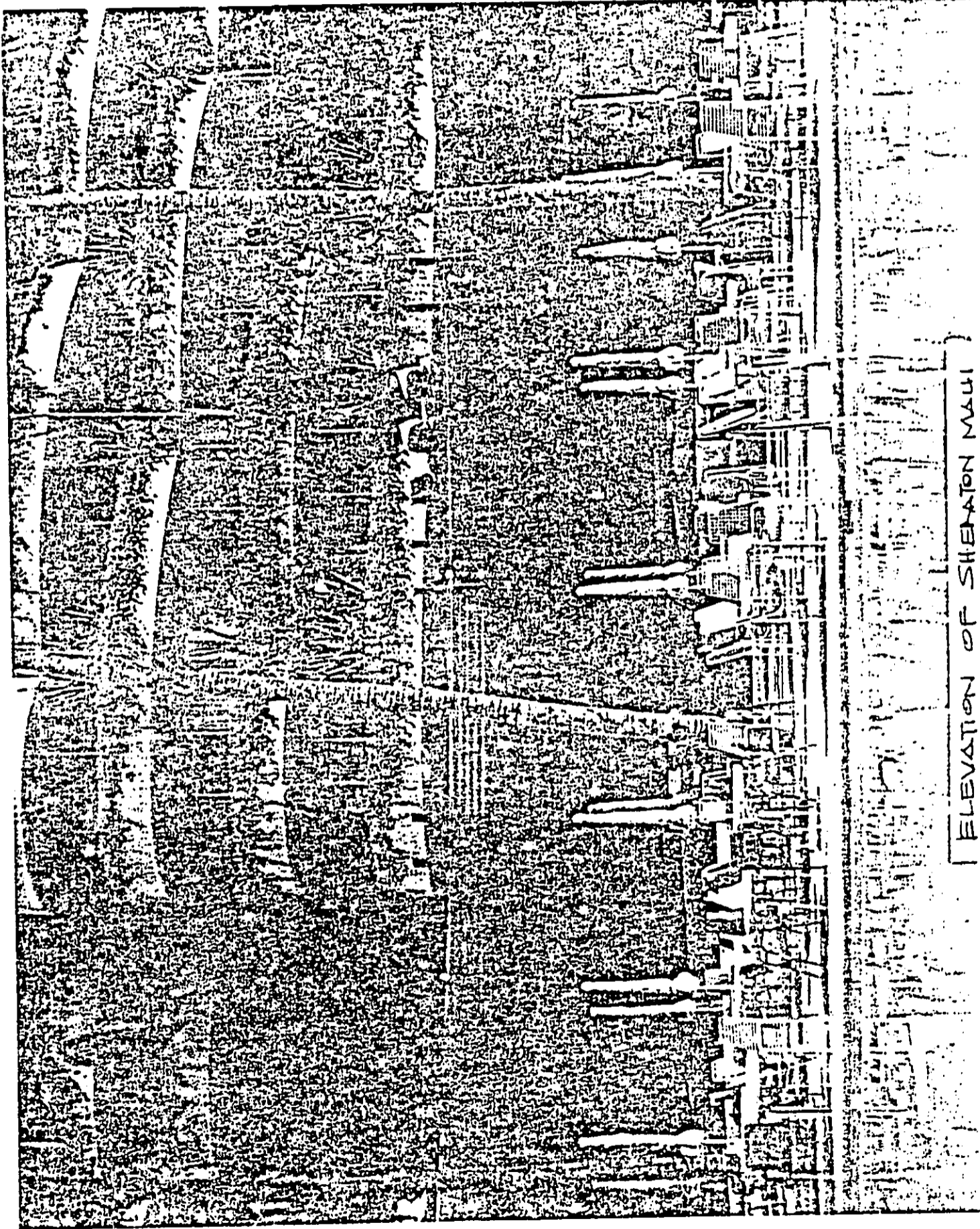


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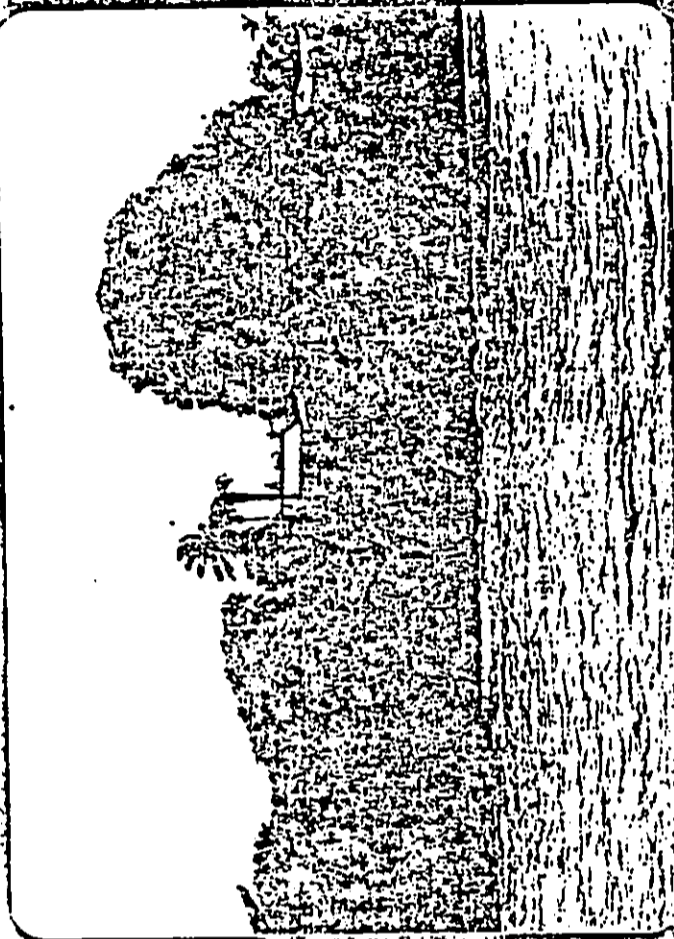
齋藤

Atsuki Saito
Consulting Engineer

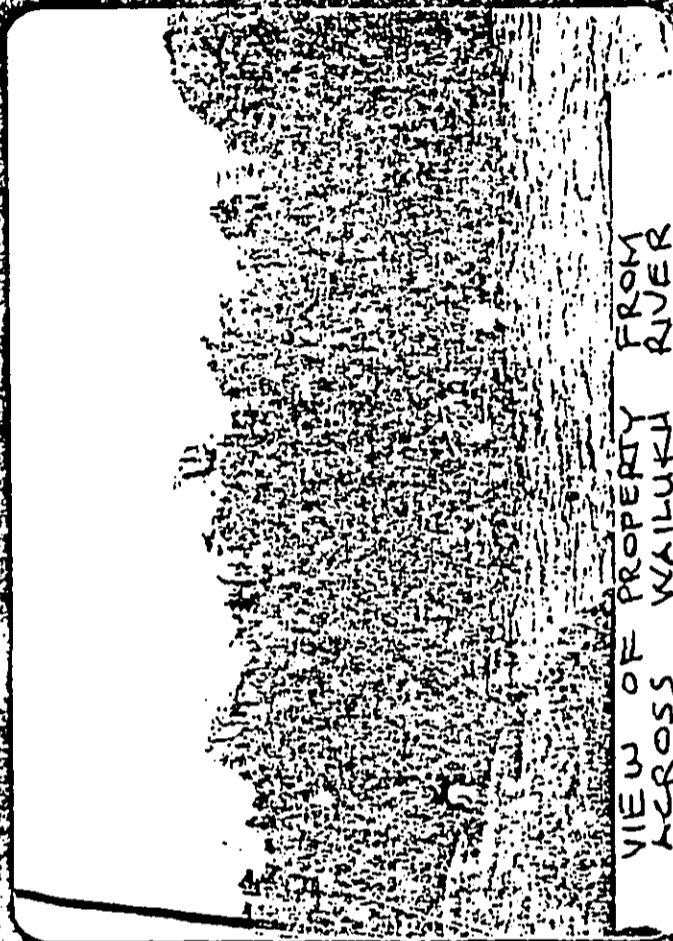


ELEVATION OF SHENATON MAUI

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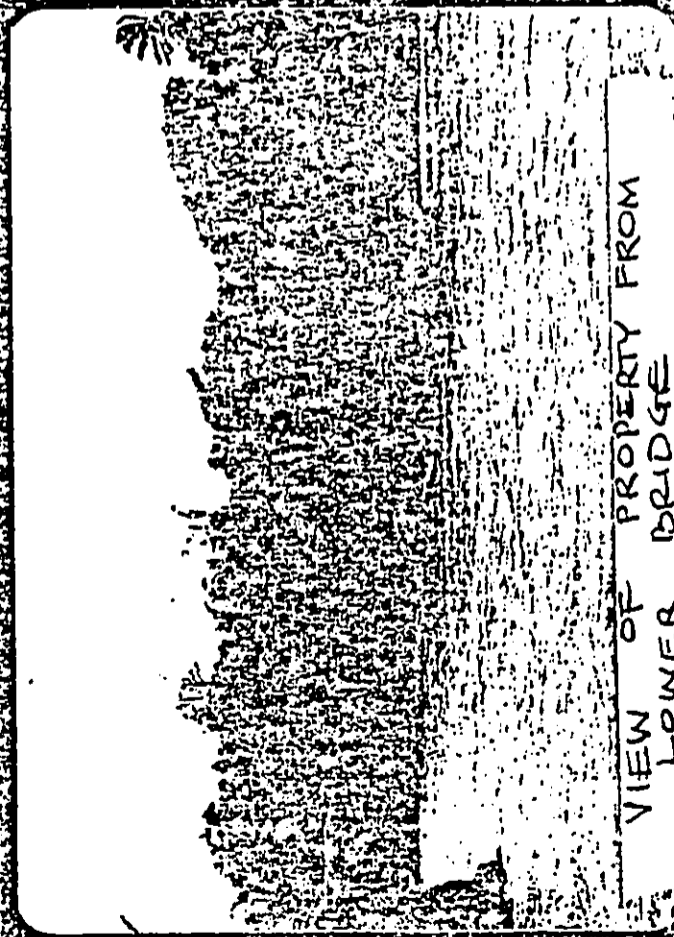
VIEW OF PROPERTY FROM
ACROSS WAILUKU RIVER



VIEW OF PROPERTY FROM
ACROSS WAILUKU RIVER



VIEW OF PROPERTY FROM
LOWER BRIDGE



VIEW OF PROPERTY FROM
LOWER BRIDGE

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LOOKING AT PROPERTY FROM
ACROSS THE BAY BY TELEPHONE



LOOKING AT PROPERTY FROM
LOWER BRIDGE

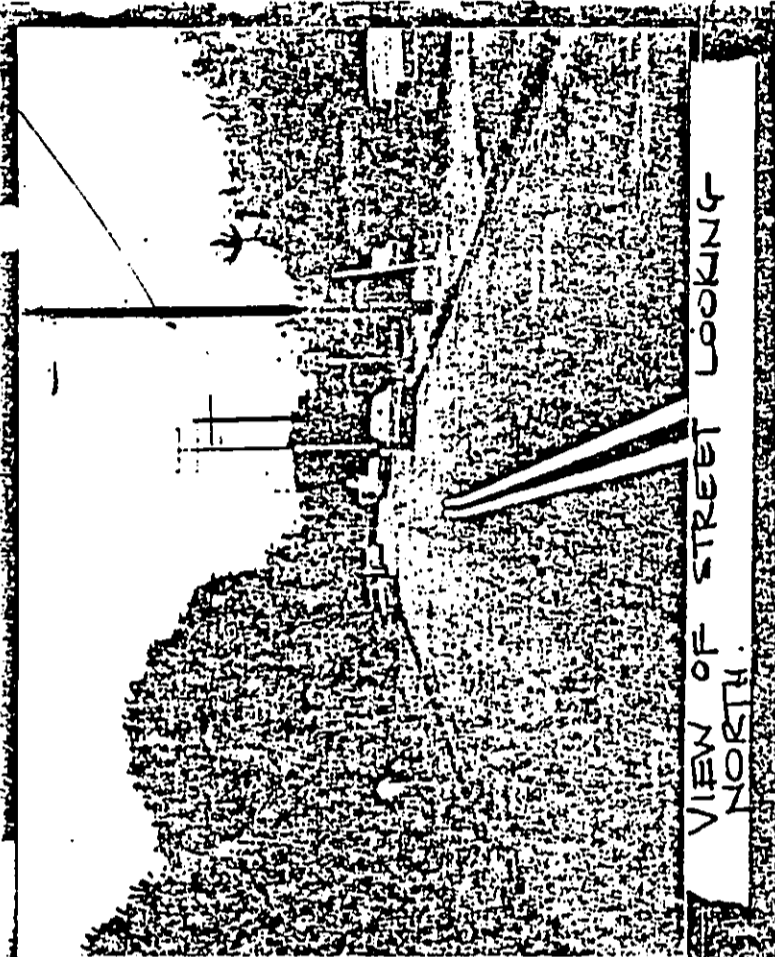


LOOKING AT PROPERTY FROM
ACROSS THE BAY



PROPERTY FROM NORTH SIDE
OF LOWER BRIDGE

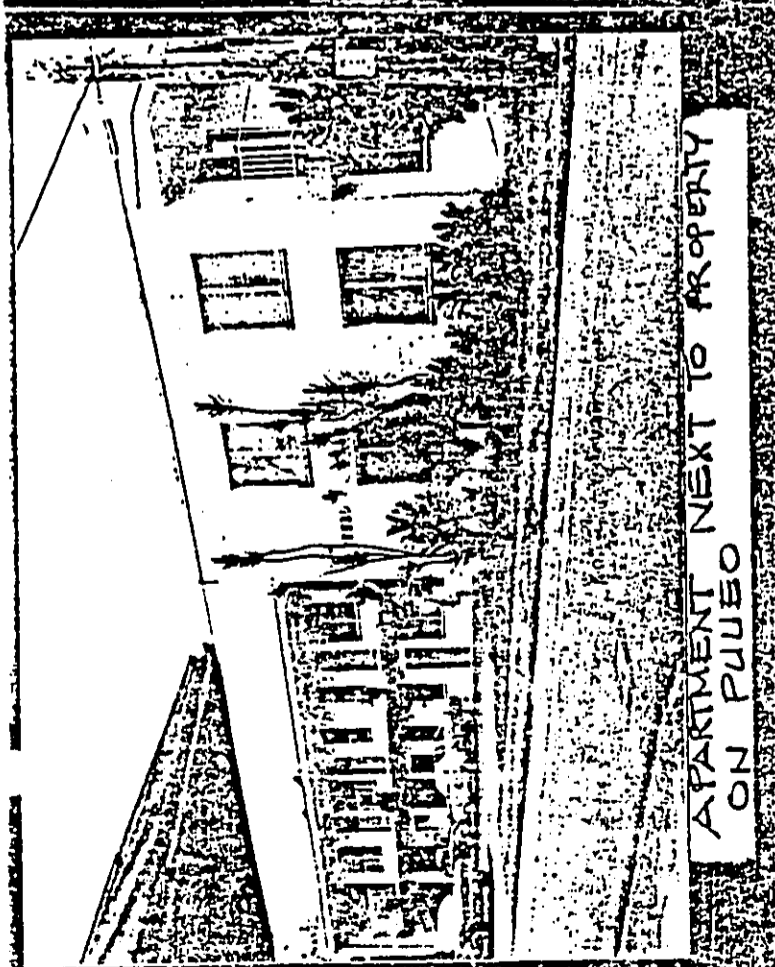
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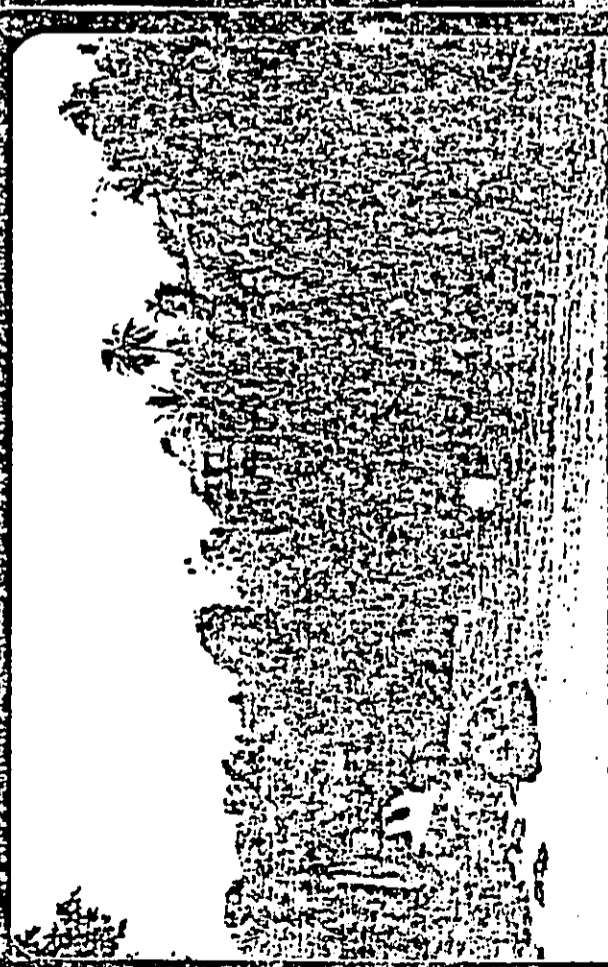
VIEW OF STREET LOOKING NORTH.



VIEW DOWN KOUL LANE AND ADJACENT TO PROPERTY.

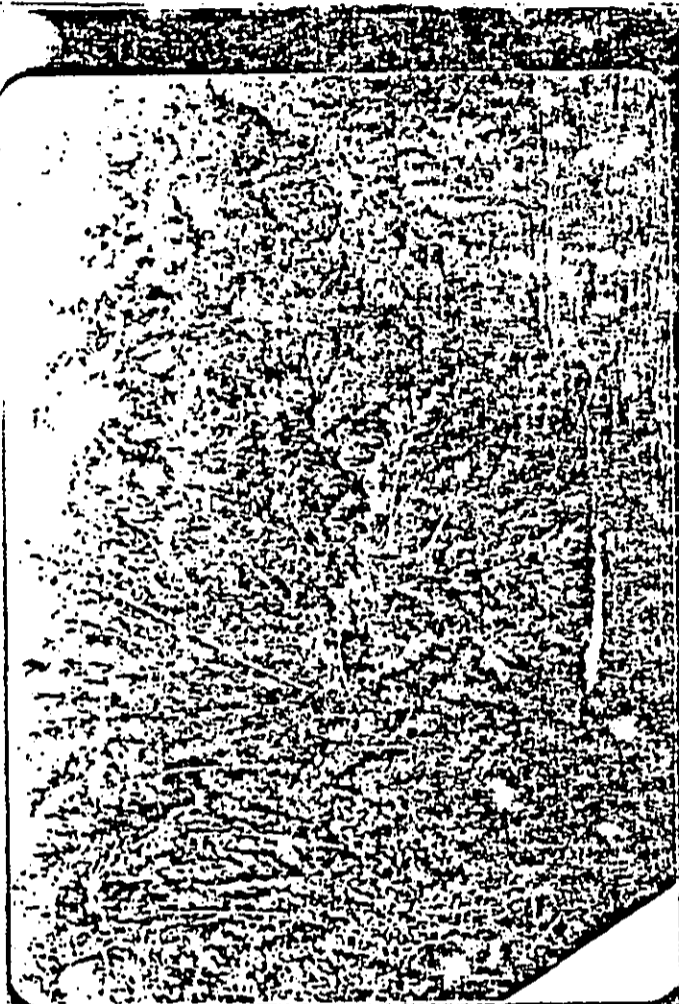


APARTMENT NEXT TO PROPERTY ON PUERO

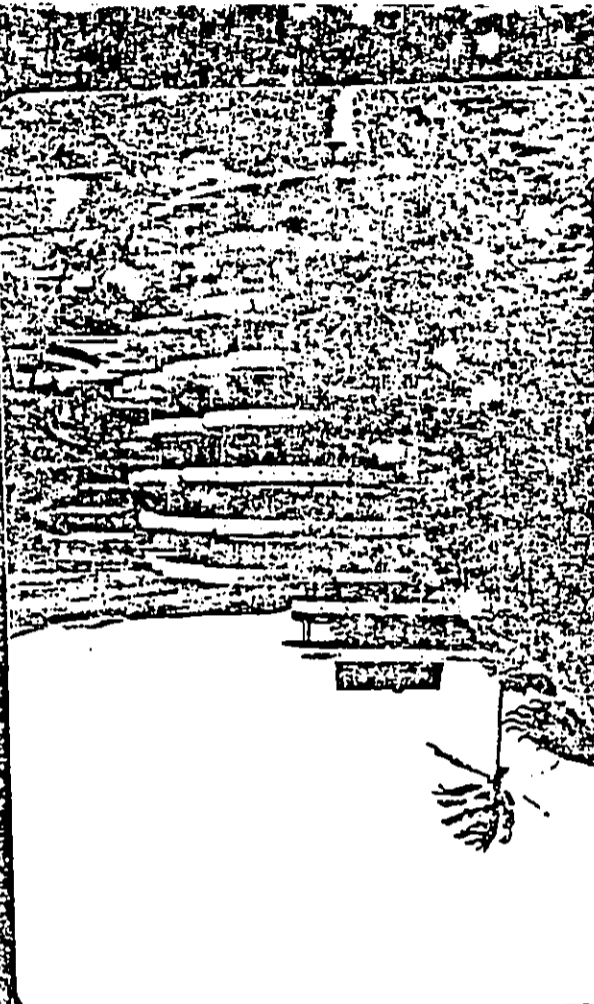


NEAREST CONDOMINIUM UNIT NEXT BRIDGE UP

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PROPERTY LOOKING FROM ACROSS
WAILUKU RIVER.



SHERATION MAHI

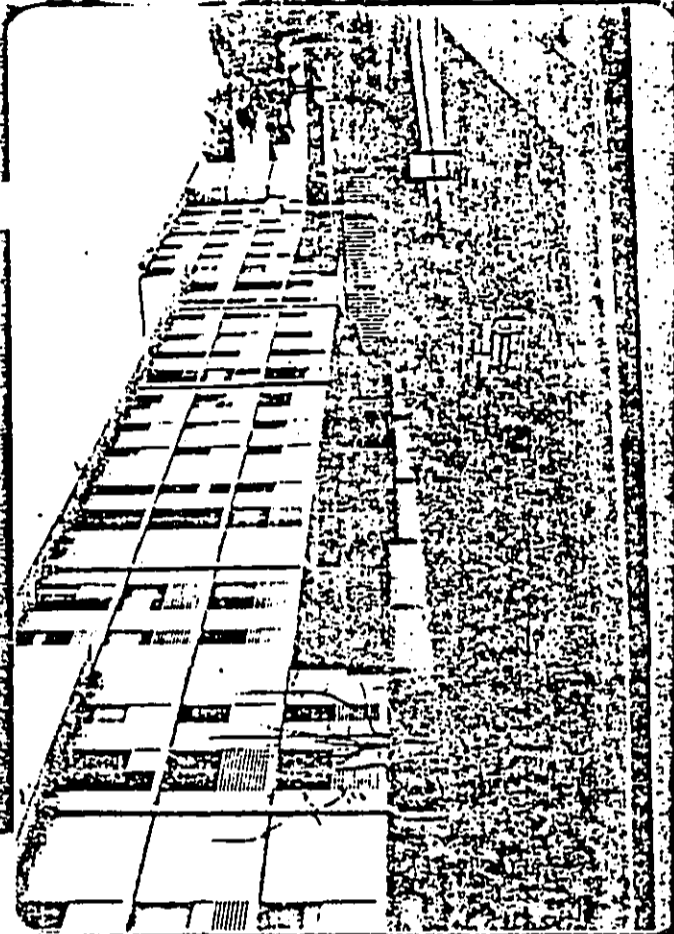


PROPERTY LOOKING FROM ACROSS
WAILUKU RIVER

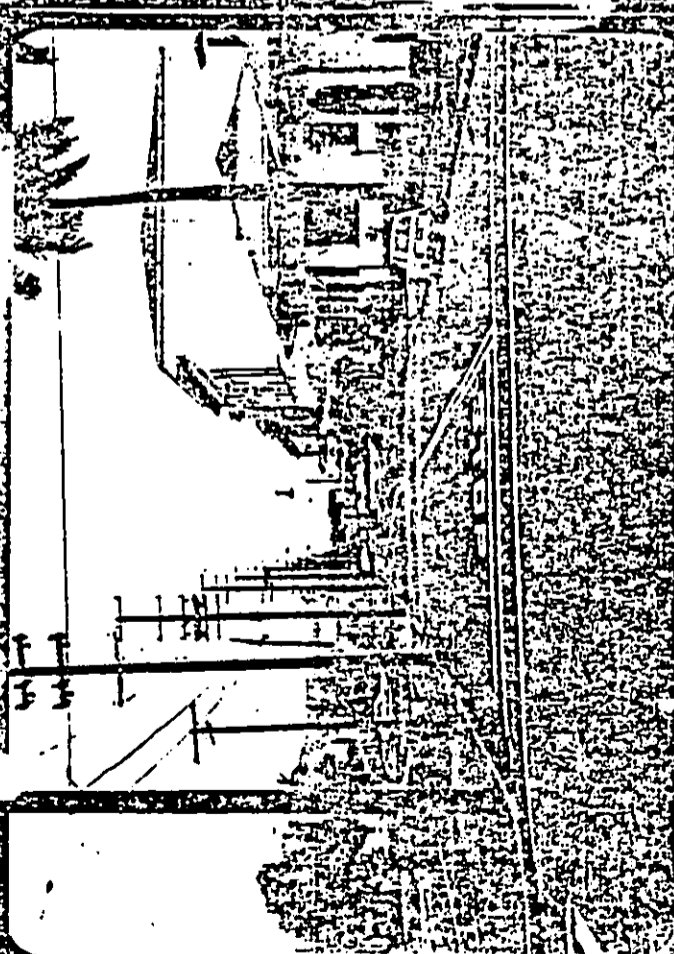
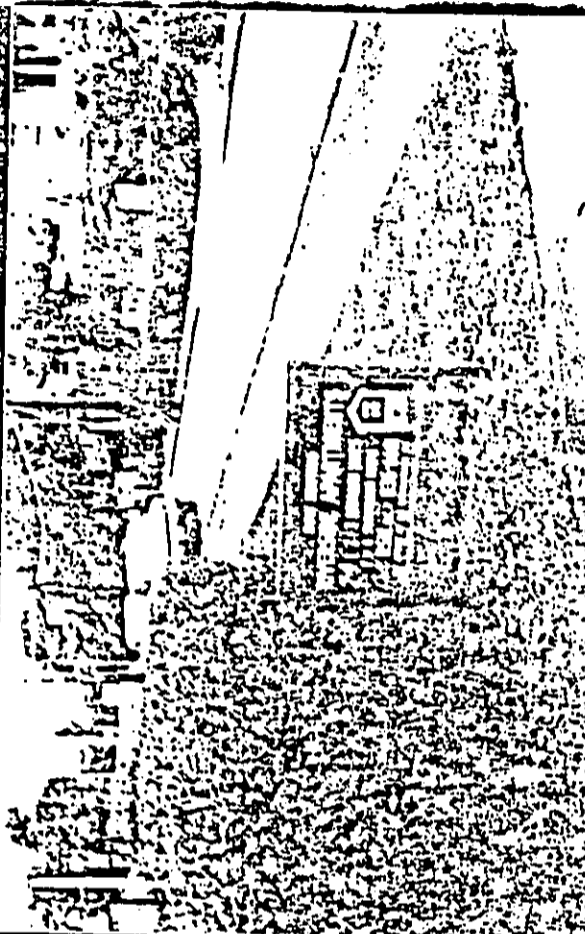


VIEW OF BAY FROM
MIDDLE OF PROPERTY

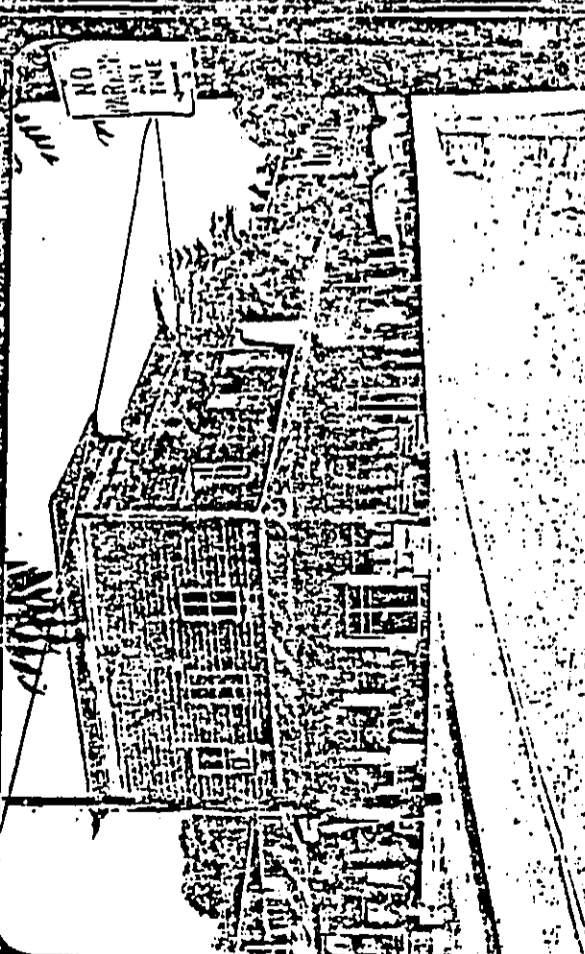
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FHA APARTMENTS LOCATED ON PUUEO STREET - ACROSS PROPERTY.

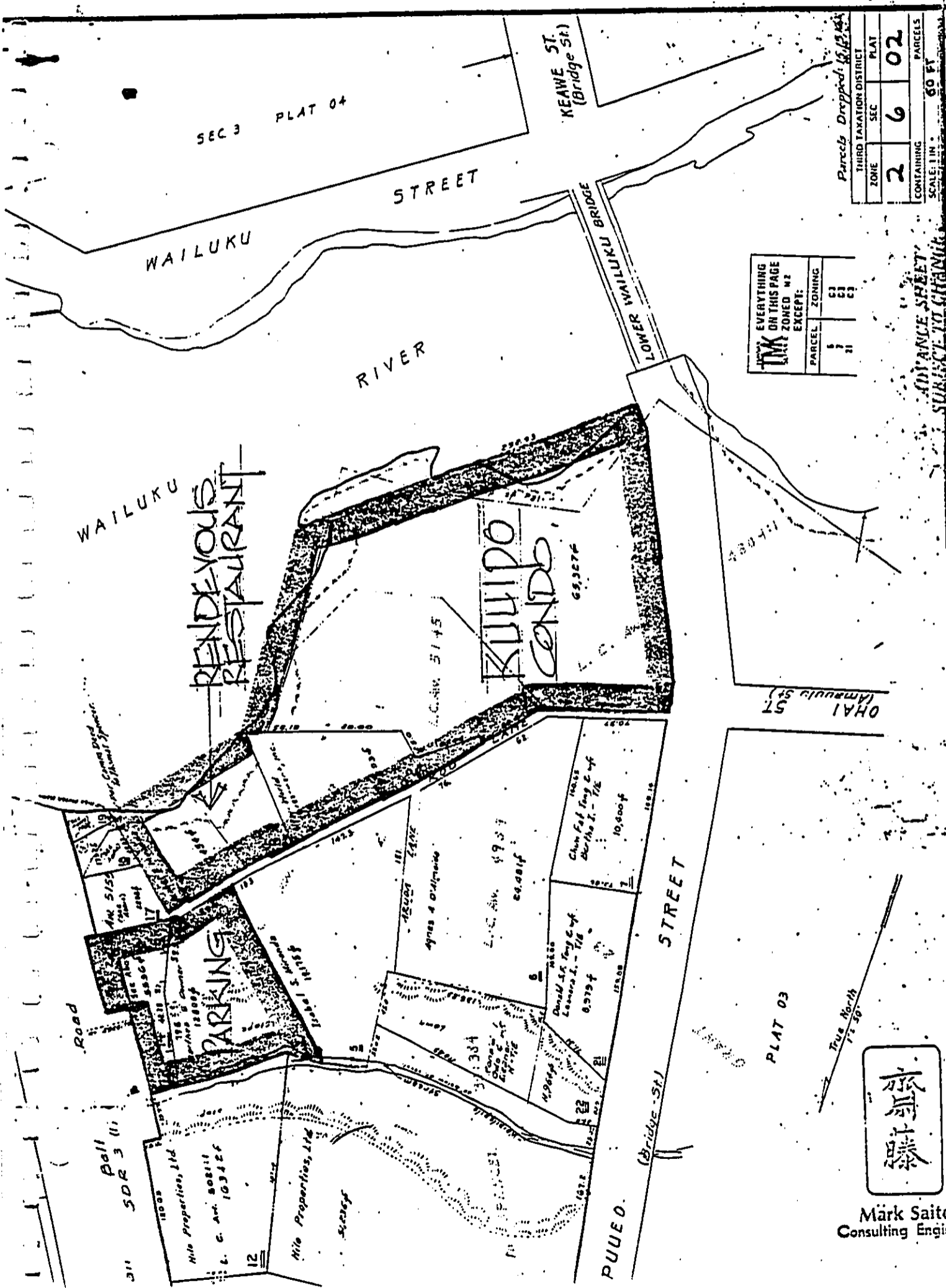


DOWN TOWN HILO - FROM PROPERTY ACROSS BRIDGE



STORE DIAGONALLY ACROSS KULIPO PROPERTY.

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Parcels Dropped: 10, 11, 12, 13, 14

THIRD TAXATION DISTRICT		PLAT	PARCELS
ZONE	2	6	02
CONTAINING			60 FT
SCALE: 1 IN			

EVERYTHING ON THIS PAGE ZONED #2 EXCEPT:

PARCEL	ZONING
1	C3
2	C3
3	C3

ADVANCE SHEET
SURVEY IN CHARGE



Mark Saito
Consulting Engineer

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Mid-Pac Design Associates
architectural-civil-structural
building designer
648 Menlo Avenue, Suite 6
Menlo Park, Ca. 94025
415/322-5775

REGISTERED PROFESSIONAL ENGINEER
CIVIL AND STRUCTURAL BRANCHES:
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Hawaii S.E. #PE-03595, C.E. #PE-03595
Nevada S.E. #04071, C.E. #04071
New York S.E. #PE-052346,
C.E. #PE-052346

SUMMARY: Thirty three (33) years in design, engineering, architecture, and construction on over 400 building projects. Some of the more notable projects are as follows:

- o North Terminal San Francisco International Airport-\$350 million plus.
- o San Francisco Transamerica Pyramid - \$65 million plus.
- o St. Francis Hotel Addition, 32 stories-\$25 million plus.
- o Southern Pacific 43 stories-28 stories, 6 stories rest of the block, One Market Plaza, San Francisco, Ca. -\$80 million plus.
- o Ala Moana Shopping Center, Honolulu-\$100 million plus.
- o Kaiser Hawaii Kai Subdivision, Koko Head, Honolulu, Hawaii, \$350 million plus.
- o Dish Antennas-40 ft., 100 ft., 200 ft. in diameter for landing astronauts on the moon, also satellite monitoring.
- o High frequency radio antennas in the Arctic and Anarctic.
- o Nike Zues and Nike Hercules projects in the South Pacific islands, part of America's early warning system.
- o Cement plants-Kaiser at Permanente and Cushenberry, Ca. ; Dillingham Cement plant at Ewa, Honolulu.
- o Pearl Harbor-U.S. Navy Nuclear Sub-Base and Guam Fleet Landing.
- o Hotels, apartments, industrial plants-up to \$10 million each.
- o Candlestick Park Stadium, San Francisco, Ca.
- o S. F. Muni Metro Rail Center at Ocean and San Jose Sts.

Mr. Saito's experience includes the preparation of architectural, structural, and civil designs; building construction, ports and harboras and process plants; construction management; estimating, land development and planning; real estate development and finance packaging of subdivisions-condominiums-shopping centers; and cement plants, pretress concrete plants, oil refineries and steel fabrication.

PROFESSIONAL SOCIETIES:

1. Structural Engineers Association of Northern California.


Design Associates

MENLO ATHERTON
REAL ESTATE INVESTMENTS, INC.

MARK V. SAITO
President

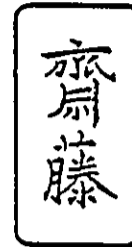
(415) 322-5775
648 MENLO AVE., SUITE #6
MENLO PARK, CALIFORNIA 94025

CAPABILITIES:

Multi-story analysis
Indeterminate structures
Prestressed concrete
Post tensioned concrete
Reinforced concrete
Structural steel
Timber construction
Thin shell and plates
Mat foundations
Foundations and retaining walls
Precast construction
Prefabricated structures
Steel detailer
Tilt-up construction
Slip form construction
Earthquake engineering
Structural dynamics
Plasticity and Ultimate Strength
Matrix Structural Analysis
Computer Analysis

TYPE OF PROJECTS:

Apartments
High rise structures
Residential
Shopping centers
Offices
Condominiums
Planned unit developments
Parking structures
Warehouses
Industrial plants
Subdivisions
Process plants-oil-cement-rock-plastics
Medical-dental
Remodeling
Town houses
Swimming pools
Convalescent hospitals
Golf courses
Hotels
Motels
Churches
Schools
Harbor developments
Bridges
Drainage facilities
Mobile home parks
Resorts and recreational communities



Mark Saito
Consulting Engineer

EDUCATION:

University of Hawaii, B.S. in Civil Engineering, 1961.

REGISTERED CIVIL ENGINEER: California, No. 19231, Hawaii, #PE-03595
Nevada, #04071, New York #PE-052346

REGISTERED STRUCTURAL ENGINEER: California, #S1766, Hawaii, #PE-03595
Nevada, #04071, New York #PE-052346

PERSONAL DATA:

Height: 6'0" Weight: 225 lbs. Health: Excellent
Born Honolulu, September 5, 1928

REFERENCES:

Excellent personal and professional references will
be furnished upon request.

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CAPABILITIES:

Multi-story analysis
Indeterminate structures
Prestressed concrete
Post tensioned concrete
Reinforced concrete
Structural steel
Timber construction
Thin shell and plates
Mat foundations
Foundations and retaining walls
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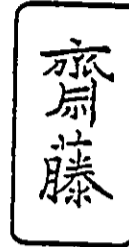
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Residential
Shopping centers
Offices
Condominiums
Planned unit developments
Parking structures
Warehouses
Industrial plants
Subdivisions
Process plants-oil-cement-rock-plastics
Medical-dental
Remodeling
Town houses
Swimming pools
Convalescent hospitals
Golf courses
Hotels
Motels
Churches
Schools
Harbor developments
Bridges
Drainage facilities
Mobile home parks
Resorts and recreational communities



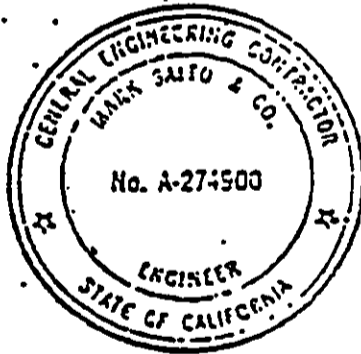
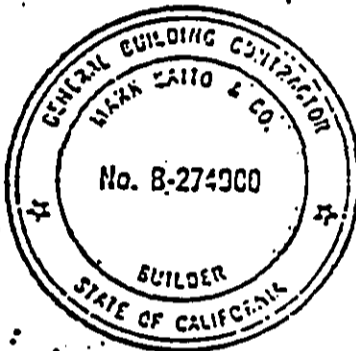
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Consulting Engineer

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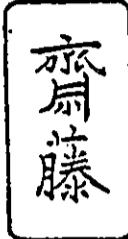


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CONSULTING ENGINEER
Civil and Structural Design

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1977 STATE OF CALIFORNIA DEPARTMENT OF CONSUMER AFFAIRS CONTRACTORS STATE LICENSE BOARD 1979

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1150 UNIVERSITY DR SUITE 102
MENLO PARK CA 94025

Mark Saito
SIGNATURE

PRIMARY CLASS B

SUPPLEMENTAL CLASSIFICATIONS

License "B" - GENERAL BUILDING CONTRACTOR

CONTRACTORS POCKET IDENTIFICATION CARD

<ul style="list-style-type: none"> A- General Engineering Contractor B- General Building Contractor C-1 Insurance & Automobile C-2 Electric, Hot Water Heating & Steam Fitting C-3 Cabinet & Mill Work C-4 Carpentry C-5 Drywall C-6 Electrical-General C-7 Elevator Installation C-8 Earthwork & Paving C-9 Flooring C-10 Flooring & Floor Covering C-11 Fire Protection Engineering C-12 Glazing C-13 Window, Heating, Ventilating & Air-Conditioning C-14 Building Masonry & Wooding C-15 Ornamental Masonry C-16 Lathing C-17 Landscaping C-18 Landscaping C-19 Landscaping C-20 Landscaping C-21 Landscaping C-22 Landscaping C-23 Landscaping C-24 Landscaping C-25 Landscaping C-26 Landscaping C-27 Landscaping C-28 Landscaping C-29 Landscaping C-30 Landscaping C-31 Landscaping C-32 Landscaping C-33 Landscaping C-34 Landscaping C-35 Landscaping C-36 Landscaping C-37 Landscaping C-38 Landscaping C-39 Landscaping C-40 Landscaping C-41 Landscaping C-42 Landscaping C-43 Landscaping C-44 Landscaping C-45 Landscaping C-46 Landscaping C-47 Landscaping C-48 Landscaping C-49 Landscaping C-50 Landscaping C-51 Landscaping C-52 Landscaping C-53 Landscaping C-54 Landscaping C-55 Landscaping C-56 Landscaping C-57 Landscaping C-58 Landscaping C-59 Landscaping C-60 Landscaping C-61 Landscaping C-62 Landscaping C-63 Landscaping C-64 Landscaping C-65 Landscaping C-66 Landscaping C-67 Landscaping C-68 Landscaping C-69 Landscaping C-70 Landscaping C-71 Landscaping C-72 Landscaping C-73 Landscaping C-74 Landscaping C-75 Landscaping C-76 Landscaping C-77 Landscaping C-78 Landscaping C-79 Landscaping C-80 Landscaping C-81 Landscaping C-82 Landscaping C-83 Landscaping C-84 Landscaping C-85 Landscaping C-86 Landscaping C-87 Landscaping C-88 Landscaping C-89 Landscaping C-90 Landscaping C-91 Landscaping C-92 Landscaping C-93 Landscaping C-94 Landscaping C-95 Landscaping C-96 Landscaping C-97 Landscaping C-98 Landscaping C-99 Landscaping C-100 Landscaping 	<ul style="list-style-type: none"> C-1 Landscaping C-2 Masonry C-3 Paving & Highway Improvement C-4 Painting & Decorating C-5 Plastering C-6 Roofing C-7 Signage Systems C-8 Sheet Metal C-9 Structural Steel C-10 Structural Steel, Reinforcing C-11 Steel, Structures C-12 Scaffolding, Form C-13 Tile, Lathwork & related C-14 Water Conditioning C-15 Wood Grading (interior) C-16 Wooding C-17 Lathing C-18 Lathing C-19 Lathing C-20 Lathing C-21 Lathing C-22 Lathing C-23 Lathing C-24 Lathing C-25 Lathing C-26 Lathing C-27 Lathing C-28 Lathing C-29 Lathing C-30 Lathing C-31 Lathing C-32 Lathing C-33 Lathing C-34 Lathing C-35 Lathing C-36 Lathing C-37 Lathing C-38 Lathing C-39 Lathing C-40 Lathing C-41 Lathing C-42 Lathing C-43 Lathing C-44 Lathing C-45 Lathing C-46 Lathing C-47 Lathing C-48 Lathing C-49 Lathing C-50 Lathing C-51 Lathing C-52 Lathing C-53 Lathing C-54 Lathing C-55 Lathing C-56 Lathing C-57 Lathing C-58 Lathing C-59 Lathing C-60 Lathing C-61 Lathing C-62 Lathing C-63 Lathing C-64 Lathing C-65 Lathing C-66 Lathing C-67 Lathing C-68 Lathing C-69 Lathing C-70 Lathing C-71 Lathing C-72 Lathing C-73 Lathing C-74 Lathing C-75 Lathing C-76 Lathing C-77 Lathing C-78 Lathing C-79 Lathing C-80 Lathing C-81 Lathing C-82 Lathing C-83 Lathing C-84 Lathing C-85 Lathing C-86 Lathing C-87 Lathing C-88 Lathing C-89 Lathing C-90 Lathing C-91 Lathing C-92 Lathing C-93 Lathing C-94 Lathing C-95 Lathing C-96 Lathing C-97 Lathing C-98 Lathing C-99 Lathing C-100 Lathing
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DEPARTMENT OF CONSUMER AFFAIRS STATE OF CALIFORNIA CONTRACTORS STATE LICENSE BOARD

1020 N STREET SACRAMENTO, CALIFORNIA 95814

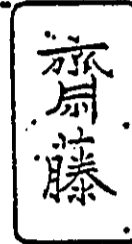
DOCUMENT CAPTURED AS RECEIVED

Mark Saito & Co.

General Building, Design and Engineering Contractor

13 El Camino Real
 San Bruno, California 94306
 510-277-7263

NOTE: I HAVE 5 CONTRACTORS
 LICENSES IN THE STATE OF
 CALIFORNIA. PRESENTLY SEEKING T
 C-10 ELECTRICAL CONTRACTORS LIC



Mark Saito
 Consulting Engineer

STATE OF CALIFORNIA
 DEPARTMENT OF CONSUMER AFFAIRS
 CONTRACTORS STATE LICENSE BOARD
 EXPIRES JUNE 30, 1979

1977

1979

RECEIPT NO.	DATE
59870	07 01 77

LICENSE NO. 274900 SAITO MARK & COMPANY
 1150 UNIVERSITY DR
 MENLO PARK CA 94025

CLASSIFICATION: A

SUPPLEMENTAL CLASSIFICATIONS: B, C51, C36, C20

SIGNATURE

LICENSE "A" - GENERAL ENGINEERING CONTRACTOR
 LICENSE "B" - GENERAL BUILDING CONTRACTOR
 LICENSE "C51" - STRUCTURAL STEEL CONTRACTOR
 LICENSE "C36" - PLUMBING CONTRACTOR
 LICENSE "C20" - WARM AIR HEATING, VENTILATING, AND AIR CONDITIONING CONTRACTOR

CONTRACTORS POCKET IDENTIFICATION CARD

A - General Engineering Contractor B - General Building Contractor C - 1 Electrical & Electronic C - 2 Insulation & Acoustical C - 4 Boiler, Hot Water Heating & Steam Fitting C - 5 Cabinet & Mill Work C - 6 Carpentry C - 7 Drywall C - 10 Electrical General C - 11 Electrical Instrumentation C - 12 Earthwork & Paving C - 13 Fencing C - 14 Flooring & Floor Covering C - 15 Fire Protection Engineering C - 17 Cleaning C - 20 Warm Air Heating, Ventilating & Air Conditioning C - 21 Building Moving & Working C - 22 Ornamental Metals C - 23 Lathing	C - 27 Landscaping C - 28 Masonry C - 29 Painting & Highways Improvement C - 30 Painting & Decorating C - 31 Paving C - 32 Plumbing C - 33 Refrigeration C - 34 Roofing C - 35 Sanitation Systems C - 36 Sheet Metal C - 37 Structural Steel C - 38 Street Sweeping C - 39 Steel Structures C - 40 Scaffolding Erection C - 41 Trenching & Shoring C - 42 Water Conditioning C - 43 Wood Working (Finish) C - 44 Woodworking C - 45 Window Installation
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STATE OF CALIFORNIA
 DEPARTMENT OF CONSUMER AFFAIRS
 CONTRACTORS STATE LICENSE BOARD

1020 N STREET
 SACRAMENTO, CALIFORNIA 95814

This license is the property of the Registrar of Contractors, and shall be returned to the Registrar upon demand when suspended, annulled, or invalidated for any reason. It becomes void if not renewed on or before June 30th of each odd-numbered year.

RONALD REAGAN, GOVERNOR



CONTRACTORS LICENSE BOARD

CONTRACTOR'S LICENSE

No 274900

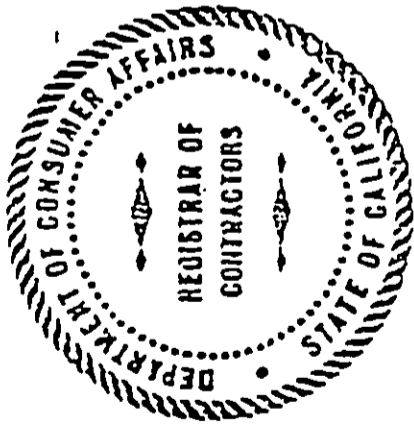
Pursuant to the provisions of Chapter 9 of Division 3 of the Business and Professions Code and the Rules and Regulations of the Contractors' State License Board, the Registrar of Contractors does hereby issue this license to:

MARK SAITO & COMPANY

to engage in the business or act in the capacity of a contractor in the following classification(s):

- A GENERAL ENGINEERING CONTRACTOR
- SB 1 GENERAL BUILDING CONTRACTOR

WITNESS my hand and official seal this 22nd day of March, 1972



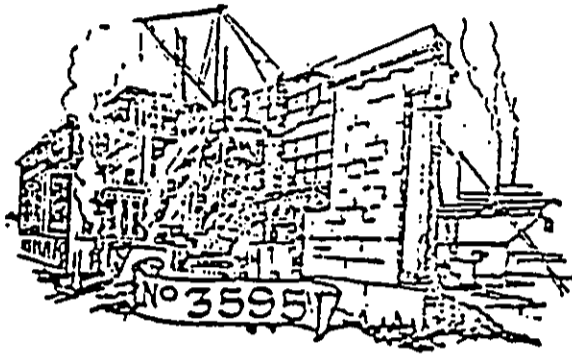
Richard P. ...
Registrar of Contractors

Signature of licensee

Signature of person who qualified on behalf of the licensee

13L-24 (REV. 2-71)

State of Hawaii



Board of Registration
of Professional Engineers,
Architects, Land Surveyors
and Landscape Architects

hereby certifies that on the date hereof

Mark Saito

was duly registered as a Professional

Engineer

having especially qualified in the

Civil and Structural Branches

and is therefore authorized to practice this
Profession within the State of Hawaii

In witness whereof, this Certificate has been issued and
the Seal of the Board affixed hereto, this 18th day of
April A.D. 1974 at Honolulu, Hawaii.



Alberto Dominguez
Chairman of the Board
Laura A. Maffeo
Secretary

May 7 1974
DATE OF ORIGINAL REGISTRATION

(THIS SPACE RESERVED
FOR DISPLAY OF
ANNUAL RENEWAL CARD)

RECORDS DIVISION



State Board of Registered Professional Engineers

This is to certify that

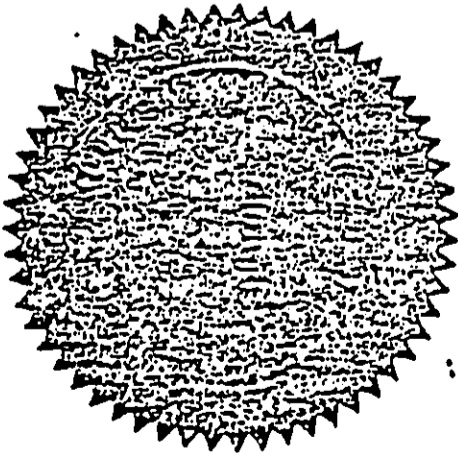
Mark W. Saito

having given satisfactory evidence of the necessary qualifications, as required by the Act of the Legislature of June 1, 1919, and amendment thereto, has been duly registered and is hereby authorized to practice as a

Professional Engineer

Civil

In the State of Nevada. In Testimony Whereof, Witness the signatures of the Members and Secretary of the Board under the Seal of the Board.



Attest:

Certificate No. 4071

Effective as of the 30th day

of MAY 1975

John H. DeLoach

W. C. Caldwell
James H. ...
...
...
Mark W. Saito
Edward ...

State Board of Registered Professional Engineers



This is to certify that

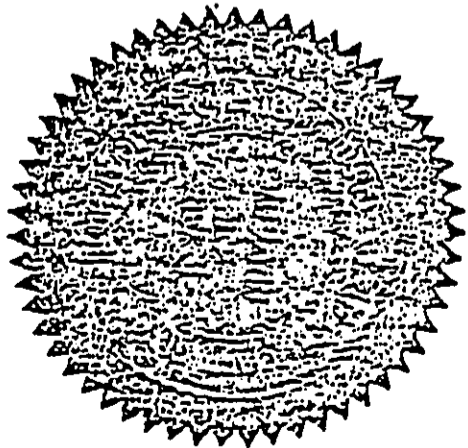
Mark W. Saito

having given satisfactory evidence of the necessary qualifications, as required by the Act of the Legislature of June 1, 1919, and amendment thereto, has been duly registered and is hereby authorized to practice as a

Professional Engineer

Structural

In the State of Nevada. In Testimony Whereof, Witness the signatures of the Members and Secretary of the Board under the Seal of the Board.



Attest:

Certificate No. 4071

Effective as of the 15th day

of MARCH 1925

John F. Galt
SECRETARY

A. F. Colby
Frank ...
H. D. ...
W. ...
George ...
Mark ...
E. ...
CHAIRMAN

STATE OF CALIFORNIA
DEPARTMENT OF PROFESSIONAL AND VOCATIONAL STANDARDS
STATE BOARD OF REGISTRATION
FOR
CIVIL AND PROFESSIONAL ENGINEERS



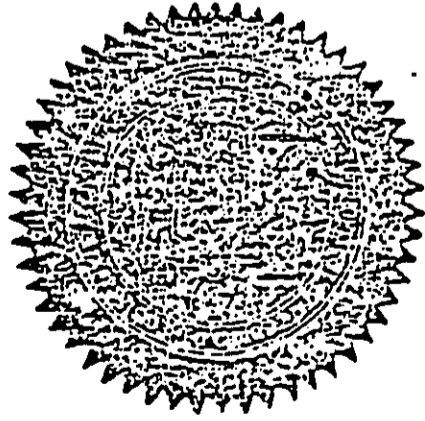
THIS IS TO CERTIFY THAT PURSUANT
TO THE PROVISIONS OF CHAPTER 7, DIVISION 3 OF THE BUSINESS AND PROFESSIONS CODE

MARK V. SAITO

IS DULY AUTHORIZED TO USE THE TITLE

STRUCTURAL ENGINEER

IN THE STATE OF CALIFORNIA, AND IS ENTITLED TO ALL THE RIGHTS AND
PRIVILEGES CONFERRED IN SAID CODE



WITNESS OUR HAND AND SEAL

CERTIFICATE NO 1766
THIS 15 TH DAY OF DECEMBER 1972

STATE BOARD OF REGISTRATION FOR
CIVIL AND PROFESSIONAL ENGINEERS

Loyan Muir
SECRETARY

Robert McLain
PRESIDENT

THIS CERTIFICATE IS THE PROPERTY OF THE STATE OF CALIFORNIA AND IN THE EVENT OF ITS SUSPENSION, REVOCATION OR
INVALIDATION, FOR ANY REASON IT MUST UPON DEMAND BE RETURNED TO THE STATE BOARD OF REGISTRATION FOR CIVIL AND PROFESSIONAL ENGINEERS

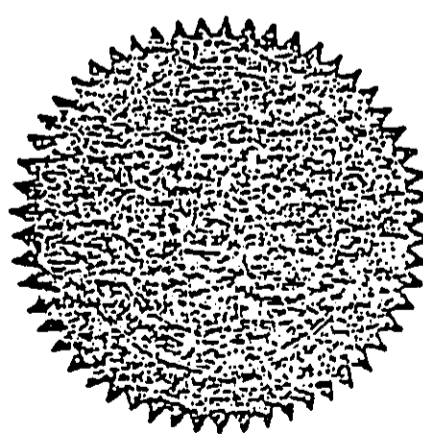
STATE OF CALIFORNIA
STATE BOARD OF REGISTRATION
FOR
CIVIL AND PROFESSIONAL ENGINEERS



THIS IS TO CERTIFY THAT PURSUANT
TO THE PROVISIONS OF CHAPTER 7, DIVISION 3 OF THE BUSINESS AND PROFESSIONS CODE

MARK V. SAITO
IS DULY REGISTERED AS A
CIVIL ENGINEER

IN THE STATE OF CALIFORNIA, AND IS ENTITLED TO ALL THE RIGHTS AND
PRIVILEGES CONFERRED IN SAID CODE



WITNESS OUR HAND AND SEAL

CERTIFICATE No. 19231

THIS 22ND DAY OF DECEMBER 1969

STATE BOARD OF REGISTRATION FOR
CIVIL AND PROFESSIONAL ENGINEERS

Logan Muir
SECRETARY

Charles J. DeL...
PRESIDENT

THIS CERTIFICATE IS THE PROPERTY OF THE STATE OF CALIFORNIA AND IN THE EVENT OF ITS SUSPENSION, REVOCATION OR
INVALIDATION FOR ANY REASON IT MUST UPON DEMAND BE RETURNED TO THE STATE BOARD OF REGISTRATION FOR CIVIL AND PROFESSIONAL ENGINEERS

EDUCATION DEPARTMENT



BE IT KNOWN, THAT

MARK V. SAITO

HAVING GIVEN SATISFACTORY EVIDENCE OF THE COMPLETION OF PROFESSIONAL AND OTHER REQUIREMENTS PRESCRIBED BY LAW IS QUALIFIED TO PRACTICE AS A

PROFESSIONAL ENGINEER

IN THE STATE OF NEW YORK

IN WITNESS WHEREOF THE EDUCATION DEPARTMENT GRANTS THIS LICENSE UNDER ITS SEAL AT ALBANY, NEW YORK THIS SEVENTH DAY OF OCTOBER, 1975.

LICENSE NUMBER

52346

Enable to sign it

PRESIDENT OF THE UNIVERSITY
AND COMMISSIONER OF EDUCATION

Lawrence J. Hollander
EXECUTIVE SECRETARY

State of California
Department of Real Estate
REAL ESTATE LICENSE

IDENTIFICATION NO.	EFFECTIVE DATE			TYPE	EXPIRATION DATE			SECURITY DEALER ENDORSEMENT	STATUS
	MO.	DAY	YR.		MO.	DAY	YR.		
1-332774-9	03	30	75	BROKER	03	29	79		A

SAITO MARK
3065 MIDDLEFIELD RD
PALO ALTO CA 94306

Robert W. Karger
100

AMERICAN INSTITUTE OF BUILDING DESIGN

THIS IS TO CERTIFY THAT

Mark V. Saito

MEMBER WHOSE REQUIREMENTS ARE HEREBY ACCEPTED AS A
Professional Building Designer

MEMBER OF THE AMERICAN INSTITUTE OF BUILDING DESIGN, INCORPORATED

AND FULLY ENTITLED TO THE PRIVILEGES GRANTED IN ITS CONSTITUTION

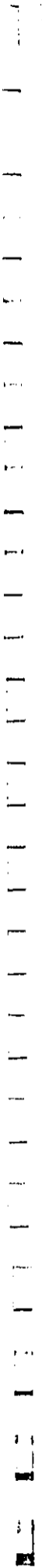
December 11, 1978

ON THIS DATE

Robert J. Zarnoch
PRESIDENT

Marion K. Blaney
SECRETARY

AMERICAN INSTITUTE OF BUILDING DESIGN



Telephone: 521-9511

SECURITY TITLE CORPORATION
Pacific Trade Center
12th Floor
Honolulu, Hawaii 96813



PRELIMINARY REPORT
no liability hereunder

RECEIVED
NOV 20 1978

SECURITY TITLE CORPORATION

Security Title Corporation
Suite 107
100 Pauahi Street
Hilo, Hawaii 96720

Attention: Carole

Order No. 86856
Escrow No. H-4097

Security Title Corporation, hereby reports that title to the land hereinafter described is on November 8, 1978 at 8:00 A. M.

vested in:

NEW-WORLD INVESTMENT, INC.
a Hawaii corporation

SECURITY TITLE CORPORATION

BY *McShane*
Title Examiner

NS:mm

SUBJECT TO:-

1. Tax Keys:- 2-6-2-1 and 2-6-2-2

For any taxes that may be due and owing and a lien on the parcel of land herein described, reference is hereby made to the Office of the Tax Assessor of the Third Division.

2. Reservation in favor of the State of Hawaii of all mineral and metallic mines as reserved in Royal Patents Numbered 4693, 4671, 4989-B and 4687.
3. Mortgage dated February 13, 1974, recorded on February 21, 1974 in the Bureau of Conveyances of the State of Hawaii in Book 9747 Page 100, made by NEW-WORLD INVESTMENT, INC., a Hawaii corporation, as Mortgagor(s), to THE REALTY INVESTMENT COMPANY, LIMITED, a Hawaii corporation, as Mortgagee(s), to secure the repayment of the sum of \$350,000.00, any additional advances and other amounts secured thereby, all according to the terms of that certain promissory note of said mortgagor(s) therein referred to.
4. Mortgage and Guaranty dated May 20, 1977, recorded on May 24, 1977 in the Bureau of Conveyances of the State of Hawaii in Book 12220 Page 243, made by NEW-WORLD INVESTMENT COMPANY, INC., a Hawaii corporation, as Mortgagor(s), and MINORU SHIGEOKA, YOICHI YAMADA, HIROMU YAMANAKA and HAJIME HARADA, Guarantors, to FINANCE FACTORS, LIMITED, a Hawaii corporation, as Mortgagee(s), to secure the repayment of the sum of \$100,000.00, any additional advances and other amounts secured thereby, all according to the terms of that certain promissory note of said mortgagor(s) therein referred to.

Security Title Corporation is informed by the Departemnt of Regulatory Agencies that NEW WORLD INVESTMENT, a Hawaii corporation is registered to do business in the State of Hawaii. However, said corporation has failed to filed its corporate exhibits for 1972 and 1977.

-DESCRIPTION-

PARCEL FIRST:

All of that certain parcel of land (portion of the land described in Royal Patent Number 4693, Land Commission Award Number 1-B to Wahine), situate at Puueo, District of South Hilo, Island and County of Hawaii, State of Hawaii, as per survey of John N. Smith Registered Surveyor, dated May 30, 1966; more particularly described as follows:

Beginning at a pipe at the West corner of this parcel of land and on the South side of Kou Lane, the coordinates of said point of beginning referred to Government Survey Triangulation Station "Halai" being 4230.34 feet North and 2644.71 feet East, and running by azimuths measured clockwise from true South:

1. 221° 38' 10" 176.23 feet along the South side of Kou Lane to a pipe;
2. 315° 10' 109.35 feet along the remainder of R. P. 4693, L. C. Aw. 1-B to Wahine to a point at the edge of the Wailuku River;
3. 71° 14' 55.12 feet along R. P. 4883, L. C. Aw. 5145 to Kauhiahwa to a pipe;
4. 71° 04' 80.00 feet along R. P. 4883, L. C. Aw. 5145 to Kauhiahwa to a pipe;

- | | | |
|----|----------|---|
| 5. | 136° 12' | 25.00 feet along R. P. 4883, L. C. Aw. 5145 to Kauhiahiwa to a pipe; |
| 6. | 53° 01' | 57.00 feet along R. P. 4883, L. C. Aw. 5145 to Kauhiahiwa to a pipe; |
| 7. | 148° 51' | 6.75 feet along R. P. 4671, L. C. Aw. 4989-B to Kaili to the point of beginning, containing an area of 9,893 square feet, or thereabouts. |

PARCEL SECOND:

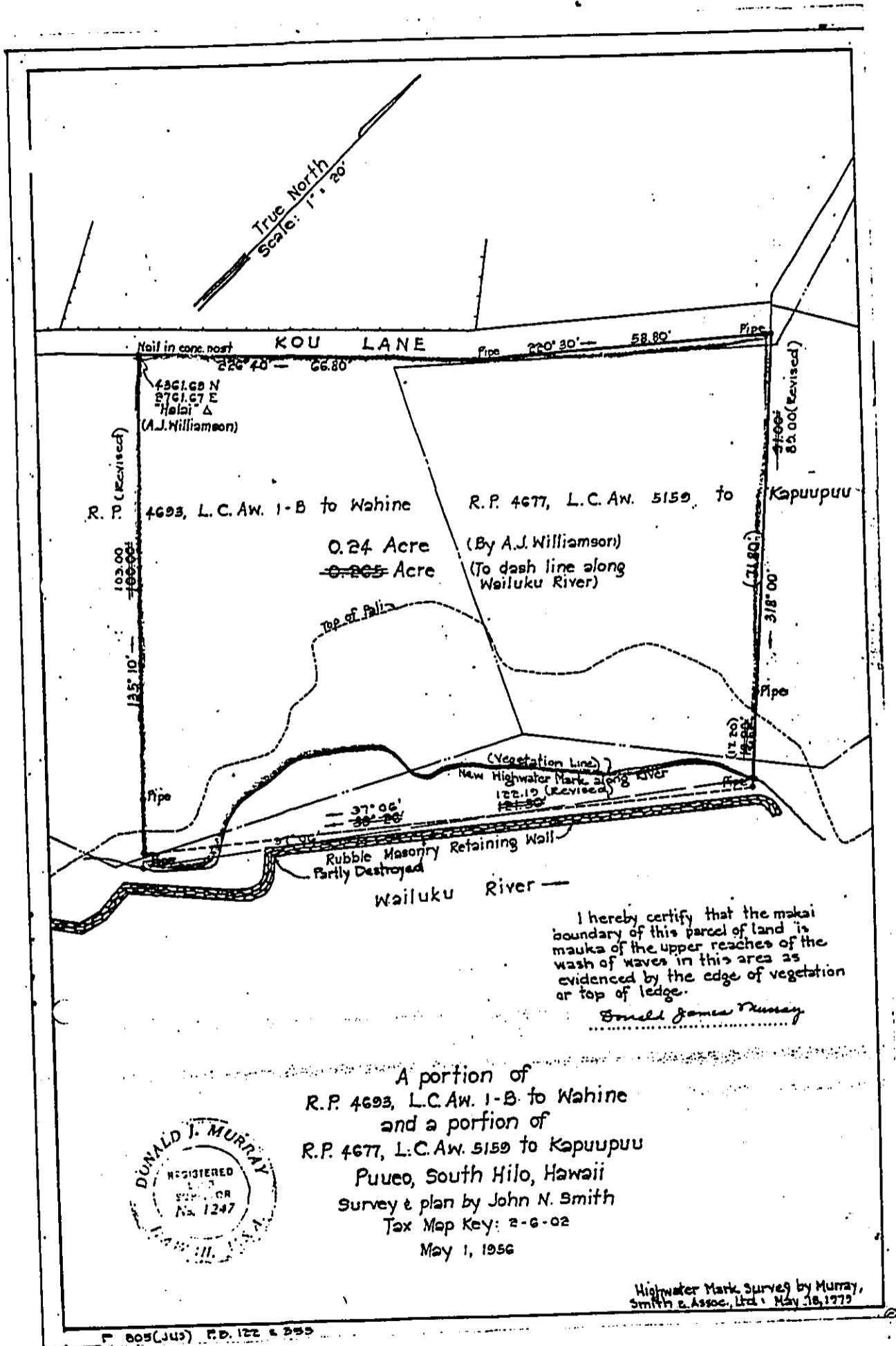
All of that certain parcel of land (portions of the lands described in Royal Patent Number 4671, Land Commission Award Number 4989-B to Kaili, Royal Patent Number 4883, Land Commission Award Number 5145 to Kauhiahiwa and Royal Patent No. 4687, Land Commission Award Number 4809, Apana 1 to Lo), situate at Puueo, District of South Hilo, aforesaid, and more particularly described as follows:

Beginning at a nail in concrete sidewalk at the Northwest corner of this parcel of land and on the East side of Puueo Street, the coordinates of said point of beginning referred to Government Survey Triangulation Station "Halai" being 4157.48 feet North and 2503.95 feet East, and running by azimuths measured clockwise from true South:

- | | | |
|----|----------|---|
| 1. | 254° 13' | 106.30 feet along the South side of Kou Lane to a pipe; |
| 2. | 221° 12' | 58.41 feet along the South side of Kou Lane to a pipe; |

3. 328° 51' 6.75 feet to a pipe;
4. 233° 01' 57.00 feet to a pipe;
5. 316° 12' 25.00 feet to a pipe;
6. 251° 04' 80.00 feet to a pipe;
7. 251° 14' 55.12 feet to a point at the edge of the Wailuku River;
- Thence following along the edge of the Wailuku River in all its windings, the direct azimuth and distances between points at the edge of the Wailuku River for the next two courses being:
8. 357° 45' 49" 180.92 feet;
9. 51° 36' 15" 298.93 feet to a point on the East side of Puueo Street;
10. 141° 25' 25.23 feet along the East side of Puueo Street to a "+" cut in concrete sidewalk;
11. 155° 40' 214.01 feet along the East side of Puueo Street to a spike;
12. 171° 12' 24.99 feet along the East side of Puueo Street to the point of beginning, containing an area of 65,327 square feet, or 1.500 acres, or thereabouts.

Being all of the land conveyed to NEW-WORLD INVESTMENT, INC., a Hawaii corporation, by Warranty Deed dated February 13, 1974, recorded on February 21, 1974 in the Bureau of Conveyances of the State of Hawaii in Book 9747 Page 95.



PUUEO PROJECT - INCREMENT I
SOIL EXPLORATION REPORT

HILO, HAWAII
TAX MAP KEY: 2-6-02: 1 & 2

To:
NEW WORLD INVESTMENT

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS
JUNE 13, 1977

1071282

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS



3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

WALTER LUM
EDWARD WATANABE
EZRA KOIKE

June 13, 1977

MR. MINORU SHIGEOKA
New World Investment
166 Keawe Street
Hilo, Hawaii 96720

Dear Mr. Shigeoka:

Subject: Puueo Project - Increment I
Soil Exploration Report
(for foundation design considerations)
Hilo, Hawaii
Tax Map Key: 2-6-02: 1 & 2

Transmitted herewith is our soil exploration report for foundation design considerations for the proposed Puueo Project - Increment I at Hilo, Hawaii.

This report includes a Boring Location Sketch, boring logs, laboratory test results, general foundation design guidelines and limitations.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Edward K. Watanabe
Edward K. Watanabe

CM/EKW:vl

C O N T E N T S

	<u>Page</u>
SCOPE OF EXPLORATION	1
FIELD EXPLORATION	1
LABORATORY TESTS	2
GENERAL SITE CONDITIONS	2
INTERPRETATION OF SOIL CONDITIONS	2
DISCUSSION AND RECOMMENDATIONS	3

APPENDICES:

- A. LOGS OF BORINGS - Boring Nos. 1 thru 3
- B. LOGS OF PROBINGS - Probing Nos. 1 and 2
- C. SUMMARY OF LABORATORY TEST RESULTS - Tables 1A and 1B
- D. PLASTICITY CHART
- E. LOAD-DEFLECTION AND TIME-CONSOLIDATION CURVES
- F. TRIAXIAL TESTS
- G. CBR TESTS
- H. BORING LOCATION SKETCH
- I. RETAINING WALLS FOR PARKING LOT - Figure 1
- J. LIMITATIONS

PUUEO PROJECT - INCREMENT I
SOIL EXPLORATION REPORT

HILO, HAWAII
TAX MAP KEY: 2-6-02: 1 & 2

SCOPE OF EXPLORATION

The purpose of this exploration was to evaluate general soil conditions for foundation design considerations for the proposed Puueo Project - Increment I at Hilo, Hawaii.

This report has been prepared for the exclusive use of New World Investment and their design consultants as a guide in the design of this specific project. This report has not been prepared for use by other parties and may not contain sufficient information for other uses.

This report includes field explorations, laboratory tests, general foundation design guidelines and limitations.

FIELD EXPLORATION

Three exploratory borings and 2 probings were made at the site. The approximate locations of the borings and probings are shown on the Boring Location Sketch.

The borings were made with 4-in. diameter augers with finger type bits. Soil samples were recovered with 3-in. diameter thin wall tubes and a 2-in. standard split spoon sampler driven with a 140-lb hammer falling 30 inches. Rock samples were recovered with a "BX" double tube core barrel using carbide coring bits.

The probings were made by driving a 2-in. diameter blunt point with a 140-lb hammer falling 30 inches.

LABORATORY TESTS

Laboratory tests included: natural water content and density, Atterberg limit, unconfined compression, torvane, grain-size analysis, specific gravity, triaxial compression, consolidation and CBR.

A summary of the laboratory test results is given in Tables 1A and 1B.

GENERAL SITE CONDITIONS

The proposed site is located on the eastern side of Puueo Street between the lower Wailuku Bridge and Ohai Street. The Wailuku River borders the site to the southeast. An apartment building and some houses border the site to the north.

The site is presently vacant and covered with trees and brush.

The northern three-fourths of the site generally slopes down toward the southeast at gradients of about 5:1 to 10:1 with elevations of about 32 to 42 ft. The southern one-fourth of the site generally slopes down toward Wailuku River at gradients of up to 2:1.

INTERPRETATION OF SOIL CONDITIONS

From the field exploration and laboratory test results, the soils encountered in the borings may be approximated as follows:

A surface layer about 18 to 21 ft of soft to medium clayey silt (volcanic ash) over fractured or decomposed rock to about 30 ft, the depths drilled.

Water was noted in 2 of the borings at about 4 to 11-ft depths during the field explorations. This may have been perched or drill water.

Variations to the above soil and water conditions should be expected between borings and in localized areas.

For more detailed descriptions of soils encountered in the drill holes, refer to the boring logs.

DISCUSSION AND RECOMMENDATIONS

The proposed plan for Increment I is to construct a 4-story wood-frame structure about 160 ft by 50 ft in plan and a parking lot.

Cuts of up to about 10 ft are contemplated.

Because of the surface ash, fills should be avoided.

Retaining and basement walls are anticipated. If practicable, retaining type walls should be planned as part of the parking lot development and not part of the building structure.

Site Grading

The field exploration indicated about 20 ft of soft to medium clayey silt (volcanic ash) at the site overlying a lava formation. Due to the high moisture content of the soils and sloping topography of the southern portion of the site along the shoreline, the construction of fills should be avoided, particularly under buildings and near the tops of slopes.

The surface soil (volcanic ash) has a high water content and may soften under the wheels of construction equipment. A 2 to 3-ft blanket of select, fairly well-graded granular material, "aa," may be considered to form a working platform over the ash soils. The thickness of the working platform may be adjusted in the field.

Surface vegetation, miscellaneous debris and loose organic topsoil should be removed to natural ground prior to site work.

Localized soft pockets encountered during site preparations should be excavated and replaced with compacted select fill material.

Foundations

Because of the soft, high moisture surface soils and closeness to the banks of Wailuku River, deep foundations are recommended.

For the proposed structure, the following foundation alternatives may be considered:

Cast-in-place pile foundations

Twelve-inch diameter cast-in-place piles may be used.

The piles should penetrate to the underlying rocky layer.

The drilled holes should be made in such a manner as to secure a full-sized shaft and provide as clean a hole as practicable.

Concrete should be deposited thru chutes to construct the piles from the bottom up.

Estimated allowable capacities of 30 tons per pile may be used.

Estimated allowable lateral capacities of 2 kips per pile may be used for piles in direct contact with undisturbed ground.

Another alternative to resisting lateral forces is to use batter piles. However, batter piles tend to lift the structure upward when subjected to lateral forces.

Predrilled, driven precast pile foundations

Prestressed concrete pile foundations may be used. To reduce disturbance and possible slope stability problems in the high moisture surface soils, predrilling down to the rocky layer is recommended. After predrilling, the piles may then be driven into the underlying rocky layer.

Twelve-inch square piles may be used.

An estimated allowable design load of 40 tons may be used.

Estimated allowable lateral capacity of 2 kips per pile may be used where the pile is in contact with the surrounding ground. Void spaces around the pile should be filled by grouting.

Another alternative to resisting lateral forces is to use batter piles. However, batter piles tend to lift the structure upward when subjected to lateral forces.

The piles should be driven with a hammer delivering around 15,000 ft-lbs of energy. The piles should be driven into the underlying rock layer to about 45 blows per foot for 5 ft, but not to be overdriven to more than 10 blows per inch for the last 2 in., or 20 blows for the last fraction of an inch.

The estimated pile lengths may vary considerably because of erratic subsoil conditions. Test piles should be driven to estimate the order lengths to be used for this project. The same type of hammer should be used for production driving as used for the test piles.

The piles should be spaced as far apart as practicable and generally not less than 3 ft on centers.

The pile driving contractor should observe that piles already in place are not heaved upward during pile driving. Any pile that has been heaved upward should be redriven to its original position.

Ground Floor Slab

Slab on ground

The subsoils at the site are generally soft. To reduce differential settlements, the floor slab should be separated from grade beams, walls and columns to permit the slab to float independently.

To reduce the possible slope creep effects, the outer one-half of the building adjacent to the Wailuku River slope should be designed as a structural slab.

To reduce the capillary rise of water from underlying soils, concrete slabs on ground should be placed over a base course of 4 in. of well-graded gravel less than 3/4-in. and greater than 1/4-in. in size or some other form of capillary break should be provided.

The subgrade (below the base course) should be compacted and shaped to drain. The elevation of the subgrade should be kept higher than the surrounding ground outside the building whenever practicable.

Structural System

As an alternative, a structural floor system may be considered.

Retaining and Basement Walls

Retaining walls are planned along the parking area and basement walls are planned for the first floor of the structure.

Because of the soft surface soil and additional lateral pressures from earthquake loads, if practicable, basement walls that function as retaining walls should be avoided along the ground floor of the building. The parking lot may be developed and designed with retaining walls that could be independent of the building structure. If basement walls are used for the building, the structure should be designed to resist the lateral earth pressures from earth, surcharge and earthquake loads.

For high moisture volcanic ash soils, retaining walls should be kept less than 10 ft high. Retaining walls greater than 6 ft in height in volcanic ash should be used only to retain cuts. The cut should be made as neatly as practicable and the retaining wall constructed directly against the cut bank (see Figure 1).

Other guidelines for retaining and basement walls follow:

1. Assuming a well-drained backfill, walls subjected to lateral earth pressures should be designed to resist soil pressures approximating at-rest conditions as follows:

Walls restrained at top - 60 p.c.f. equivalent fluid pressure.

Walls unrestrained at top - 45 p.c.f. equivalent fluid pressure.

The above loads should be increased by about one-third to account for earthquake loads. Additional loads due to surcharge and traffic should also be included.

The center of pressure should be considered to act somewhat above the lower third of the triangular fluid pressure diagram.

2. Estimated allowable bearing values may be as follows:
 - a. Walls not integral with the building: 1500 p.s.f. for foundations resting on select granular fill over ash. The base of the wall should rest on select dense granular fill that extends about 3 ft below and 6 ft beyond the wall (see Figure 1).
 - b. Walls integral with the building: Use pile foundations.
3. Estimated lateral resistances may be as follows:
 - a. Walls not integral with the building: Coefficient of friction of 0.35 may be used.
 - b. Walls integral with building: Ultimate passive resistances of 1500 p.s.f. may be used for lateral loads not greater than about 4 kips per lineal foot.
4. The front face of retaining walls should be designed with a batter to reduce the illusion of a leaning wall.
5. Select granular fill below the base of walls should be fairly well-graded "aa" from 3-in. to dust sizes with more than 10% passing the No. 200 sieve.
6. The granular fill below the base of a retaining wall should be well compacted to form a tight dense base.

7. Where a wall is located over or near a utility trench, the bottom of the footing should extend below the bottom of the utility trench and the wall designed to bridge over the utility.
8. In general, the retaining wall should be designed with good drainage provisions along the back of the wall. The filter material may be from 3/4-in. to dust sizes with less than 10% passing the No. 200 sieve.
9. For low walls that are not constructed directly against a cut, the backfill of the wall should be constructed with fairly well-graded granular soils.
10. Subdrains should be placed along the base of the wall and daylighted at low points. The inverts of subdrains along basement walls should be below the floor slabs. Outlet areas should be blanketed with rock to reduce plugging the outlets.
11. Basement walls should be waterproofed below the ground surface.

Driveway and Parking Area

In general, for light automobile traffic and drained subgrade conditions, an estimate of the pavement thickness for the proposed driveway and parking area is as follows:

1. Wearing course - 2-in. asphaltic concrete.
2. Base course - 4-in. base course

3. Subbase course - 6-in. select material such as select "aa" or gravel subbase.
4. Borrow
 - 12-in. select borrow (CBR >8) over an ash subgrade (CBR +1).
 - 6-in. select borrow where the subgrade is a mixture of ash and decomposed rock (CBR +3).

The subgrade should be compacted and shaped to drain. To avoid the ponding of water and softening of the subgrade at low points, weep holes should be placed at subgrade levels thru the walls of catch basins which are placed in these low areas.

Joints and Connection Details

To reduce the wavy surface effects at the ground floor level due to differential settlements or heaving, non-bearing partitions, doors, cabinets, etc., should be designed with loose fits and other precautions taken to allow for some future adjustments or maintenance.

Existing Cesspools

If cesspools are encountered within the proposed site, the locations of the cesspools should be verified.

Sludge should be removed from the bottom and the cesspool backfilled with well-graded granular material. The materials should be placed in thin layers and rammed into place or compacted with vibratory

equipment. The top 5 ft of fill should be compacted in 6-in. compacted layers.

Structural elements close to or over cesspools should be designed to span over the cesspool.

Utilities

Existing underground utilities may be located in the areas. If detected, they should be located and verified in the field prior to construction.

Utility lines should be designed with flexible joints, particularly where they cross through or under walls.

Loose backfill of utilities under the wall should be removed and recompactd.

Site Regrading

Instability problems can arise if the site is regraded, filled, poorly drained or where subsurface water is introduced, or the toe of slope is undercut on the site or on the adjoining lots.

After mass grading work is done and cuts and fills are made according to the grading plans, regrading or altering the drainage pattern at some future date should be avoided unless done under the guidance of a soils engineer.

Unforeseen Conditions

Because of the variability of soil deposits, site improvements, designs and construction techniques, existing or changed conditions may be encountered that cannot be foreseen with even the most exhaustive studies of site and project conditions. These unforeseen conditions should be recognized when encountered and then evaluated so that the designs or the construction methods may be modified accordingly, if necessary.

Unforeseen or changed or undetected conditions such as soft spots, new or existing utility trenches, underground structures, pipes, voids or cavities, cesspools, boulders, expansive soil pockets, rubbish or boulder disposal pits, seepage water or water level changes with weather, etc., may occur in localized areas and will have to be adjusted and corrected in the field as they are detected.

Contingency Allowance

It is inherent in the nature of excavation and foundation construction that some changes in plans and specifications may be necessary during the course of construction to adjust them to field conditions.

A contingency allowance should be included in the construction documents to consider costs for changed or unforeseen conditions.

Review of Plans, Specifications and Construction

Our basic scope of work does not include review of plans, specifications and construction observations.

It is recommended that the soil and foundation engineer review the final plans and specifications for general conformance with the earthwork and foundation guidelines of the soil report.

It is also recommended that the soil and foundation engineer be retained to provide engineering services during the earthwork and foundation phases of the work. This will allow the soil engineer to observe general compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from that anticipated prior to start of construction.

FIELD LOGS/BORING LOGS

A field log was prepared for each boring by our technician. The log contains drilling information and the technician's interpretation of the soil conditions between samples. The copies are kept on file in our office for one year.

We must emphasize that our recommendations are based on the boring logs included in this report and the information contained thereon and not on the field logs.

The boring logs in this report represent our interpretation of the contents of the field logs, and the results of the laboratory observations and tests of the field samples.

The stratification lines shown on each of the boring logs represent the approximate boundary between soil types and the transitions may or may not be gradual.

Symbols

Soil symbols used generally are in accordance with the Unified Soil Classification System.

Where a parenthesis "(MH)" is used, the soil sample was classified by visual observation of the sample recovered.

Where no parenthesis "MH" is used, the soil sample was classified from either the Atterberg limit or grain-size analysis test results.

Rock Cores

The Rock Quality Designation (RQD) is based on a modified core recovery ratio.

This ratio is determined by considering only pieces of core that are 4-in. and longer and fairly hard. The percentage ratio between the total length of such cores recovered and the length of core drilled on a given run is designated as the RQD.

Boring Log

PROJECT PUEO PROJECT - INCREMENT I
 LOCATION Hilo, Hawaii
 Tax Map Key: 2-6-02: 1 & 2

BORING NO. 1 Sheet No. of
 Driller W. LUM ASSOC., INC Date APRIL 29, 1977
 Field Party ASATO, CHOW
 Type of Boring AUGER CORING
 (CME 55) Diam. 4" ϕ "BX"
 Elev. 33' \pm Datum
 Drill Bit T.C. FINGER | T.C. CORING

HAMMER:
 Weight 140[#]
 Drop 30"
 SAMPLER:
 2" ϕ - 2" STANDARD SPLIT SPOON
 3" ϕ - 3" O.D. THIN WALL TUBE
 "BX" - BX DOUBLE TUBE CORE BARREL

Water Level 11'
 Time 4:30 PM
 Date 4-29-77

Unified Soil Classification	DESCRIPTION	Depth (ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Vane Shear P.S.F.	PENETRATION DATA				
										Standard Penetration Test	3" O.D. THIN WALL TUBE			
	ELEV.: 33' \pm *									N (Blows per foot)				
										0	10	20	30	40
(MH)	SOFT, BROWN CLAYEY SILT (VOLCANIC ASH ?)	0 - 2.5	2" ϕ SS	1-A	-	69	-	-	-					
		2.5 - 3.5	3" ϕ S	1-B	-	88	-	440	-					HYDRAULIC PRESSURE 300 PSI/1.0'
		3.5 - 5	2" ϕ SS	1-C	-	209	-	-	-					
		5 - 10	3" ϕ S	1-D	-	208	Y _w = 89 Y ₀ = 47	740	500					HYDRAULIC PRESSURE 275 PSI/2.0'
MH	SOFT, BROWN CLAYEY SILT (VOLCANIC ASH)	10 - 15	3" ϕ S	1-E	106	175	Y _w = 72 Y ₀ = 26	-	680 760 660 400					HYDRAULIC PRESSURE 300 PSI/2.0'
	GRAY BROWN DECOMPOSED ROCK	15 - 20	2" ϕ SS	1-F	-	32	-	-	-					
	CLINKER	20 - 25	"BX"	RUN #1										30'/0.4'
	GRAY, FRACTURED LAVA ROCK	25 - 30	"BX"	RUN #2										"HAMMER BOUNCES
	BROWN, DECOMPOSED LAVA ROCK & CLINKER (?)	30 - 31	"BX"											10B
	END OF BORING @ 31' 4-29-77													
	* ELEVATION ESTIMATED FROM SITE PLAN BY HILO ENGINEERING													
					NOTE:		Y _w = WET DENSITY, P.C.F.							CONTINUOUS PENETRATION TEST W/2" ϕ BLUNT POINT
							Y ₀ = DR. DENSITY, P.C.F.							

Boring Log

PROJECT PUUEO PROJECT - INCREMENT I
 LOCATION Hilo, Hawaii
 Tax Map Key: 2-6-02: 1 & 2
 HAMMER:
 Weight 140#
 Drop 30"
 SAMPLER: 2"SS - 2" STANDARD SPLIT SPOON
3" S - 3" O.D. THIN WALL TUBE
"BX" - BX DOUBLE TUBE CORE BARREL

BORING NO 2 Sheet No. of
 Driller W. LUM ASSOC., INC. Date APRIL 28, 1977
 Field Party ASATO, CHOW
 Type of Boring AUGER & CORING (CMESS) Diam. 4" & "BX"
 Elev. 28' ± * Datum
 Drill Bit T.C. FINGER & T.C. CORING
 Water Level 4.5'
 Time
 Date 4-29-77

Unified Soil Classification	DESCRIPTION	Depth (ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Vane Shear P.S.F.	PENETRATION DATA				
										Standard Penetration Test	3" O.D. THIN WALL TUBE			
	ELEV. = 28' ± *									N (Blows per foot)				
										0	10	20	30	40
(MH)	SOFT, BROWN CLAYEY SILT (VOLCANIC ASH)	0 - 5	2"SS	2-A	-	215	-	-	-					
(MH)	MEDIUM, BROWN CLAYEY SILT (VOLCANIC ASH) w/SOME ROUNDED GRAVEL	5 - 10	3" S	2-B	-	207	-	-	-					HYDRAULIC PRESSURE 300 PSI / 2.0'
MH	MEDIUM, BROWN CLAYEY SILT (VOLCANIC ASH)	10 - 15	3" S	2-C	163	179	360	840	-					HYDRAULIC PRESSURE 300 PSI / 2.5'
(MH)	MEDIUM, BROWN CLAYEY SILT w/ DECOMPOSED ROCK	15 - 20	3" S	2-D	-	71	-	930	-					HYDRAULIC PRESSURE 250 PSI / 2.0'
			3" S	2-E	-	55	-	-	-					HYDRAULIC PRESSURE 350 PSI / 0.2
			2"SS	2-F	-	51	-	-	-					
	CLINKER (?)	20 - 25	"BX"	RUN #1										27/0.5' 25/0.2'
	GRAY, FRACTURED LAVA ROCK w/CLINKERS? NOTE: INTERMITTENT EASY DRILLING	25 - 30	"BX"	RUN #2										
	END OF BORING @ 30' 4-28-77	30												

NOTE:
 γ_w = WET DENSITY, P.C.F.
 γ_o = DRY DENSITY, P.C.F.

* ELEVATION ESTIMATED FROM SITE PLAN BY HILO ENGINEERING

Boring Log

PROJECT PUUEO PROJECT - INCREMENT I
 LOCATION Hilo, Hawaii
 Tax Map Key: 2-6-02: 1 & 2
 HAMMER: 140 #
 Weight 30"
 Drop 2"SS - 2" STANDARD SPLIT SPOON
 SAMPLER: 3" S - 3" O.D. THIN WALL TUBE

BORING NO. 3 Sheet No. _____ of _____
 Driller W. LUM ASSOC., INC. Date MAY 2, 1977
 Field Party ASATO, CHOW
 Type of Boring AUGER (CMESS) Diam. 4"
 Elev. 40' ± * Datum -
 Drill Bit T.G. FINGER
 Water Level NOT NOTICED
 Time _____
 Date 5-2-77

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Vane Shear P.S.F.	PENETRATION DATA				
										Standard Penetration Test	3" O.D. THIN WALL TUBE			
										N (Blows per foot)				
										0	10	20	30	40
(MH)	MEDIUM, DARK BROWN CLAYEY SILT W/GRAVEL & ROOTS.	0 - 2.55	2"SS	3-A	-	63	-	-	-					
		2.55 - 3.0	3" S	3-B	-	100	-	1080	-					
		3.0 - 3.5	3" S	3-C	119	236	244	-	-					
MH	SOFT, MOTTLED BROWN CLAYEY SILT (VOLCANIC ASH)	3.5 - 10.0	3" S	3-D	-	131	-	1160	960					
		10.0 - 15.0	3" S	3-D	-			1200	600					
(MH)	SOFT, GRAY BROWN, CLAYEY SILT (VOLCANIC ASH)	15.0 - 17.0	2"SS	3-E	-	82	-	-	-					
	END OF BORING @ 17' 5-2-77	17.0												
	END OF PENETRATION @ 22' 5-2-77	22.0												
CONTINUOUS PENETRATION TEST W/2" Ø BLUNT POINT														
NOTE: γ_w = WET DENSITY, P.C.F. γ_d = DRY DENSITY, P.C.F.														
* ELEVATION ESTIMATED FROM SITE PLAN BY HILO ENGINEERING														

HYDRAULIC PRESSURE
 300 PSI / 2.0'
 HYDRAULIC PRESSURE
 350 PSI / 1.5'
 HYDRAULIC PRESSURE
 300 PSI / 2.5'

2 BLOWS / 1.0'
 2 BLOWS / 1.0'
 3 / 0.5' 10 / 0.5' 75 / 0.5'

WALTER LUM ASSOCIATES, INC.

3030 WAIALAE AVENUE • HONOLULU, HAWAII 96816 • PHONE 737-7931

Boring Log

PROJECT PUEO PROJECT - INCREMENT I

LOCATION Hilo, Hawaii

Tax Map Key: 2-6-02: 1 & 2

HAMMER:

Weight 140[#]

Drop 30"

SAMPLER: 2" DIAM. BLUNT POINT

PROBING

PROJECT NO. 1 Sheet No. of

Driller W. LUM ASSOC., INC. Date APRIL 27, 1977

Field Party ASATO, CIOW

Type of Boring CONTINUOUS PENETRATION Diam. 2"

Elev. 36'± Datum

Drill Bit

Water Level NOT NOTICED

Time

Date 4-27-77

Unified Soil Classification	DESCRIPTION	Depth (Ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Vane Shear P.S.F.	PENETRATION DATA	
										CONTINUOUS Penetration Test	
	ELEV. = 36'± *	0								N (Blows per foot) 0 10 20 30 40	
										AUGER 0.0'-2.5'	
										1 BLOW / 1.0'	
										2 BLOWS / 1.0'	
										3 BLOWS / 1.0'	
										2 BLOWS / 1.0'	
										3 BLOWS / 1.0'	
										27/0.5' 50/0.2'	
	END OF PENETRATION @ 19.7' 4-27-77	20									

* ELEVATION ESTIMATED FROM SITE PLAN BY HILO ENGINEERING

Boring Log

PROBING

PROJECT PUUEO PROJECT - INCREMENT I
 LOCATION Hilo, Hawaii
 Tax Map Key: 2-6-02: 1 & 2
 HAMMER:
 Weight 140#
 Drop 30"
 SAMPLER: 2" DIAM. BLUNT POINT

Sheet No. 2 of _____
 Driller W. LUM ASSOC., INC. Date APRIL 27, 1977
 Field Party ASATO, CHOW
 Type of Boring CONTINUOUS PENETRATION Diam. 2"
 Elev. 35' ± * Datum _____
 Drill Bit _____
 Water Level NOT NOTICED
 Time _____
 Date 4-27-77

Unified Soil Classification	DESCRIPTION	Depth (ft.)	Sampler	Sample No.	Plastic Limit	Water Cont. %	Liquid Limit	Unconf. Comp. P.S.F.	Vanr Shear P.S.F.	PENETRATION DATA	
										CONTINUOUS Penetration Test	
	ELEV. = 35' ± *									N (Blows per foot)	
										0 10 20 30 40	
		0									14/0.5'
		5									3 BLOWS/1.0'
		10									2 BLOWS/1.0'
		15									3 BLOWS/1.0'
		20									0/0.5'
											18/0.5'
											18/0.5'
											58/0.5'
	END OF PENETRATION @ 24' 4-27-74										

* ELEVATION ESTIMATED FROM SITE PLAN BY HILO ENGINEERING

PUUEO PROJECT - INCREMENT 1

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	1	2
SAMPLE NO.	E	C
DEPTH BELOW SURFACE	15.0'-17.0'	10.0'-12.5'
DESCRIPTION	BROWN CLAYEY SILT (VOLCANIC ASH)	BROWN CLAYEY SILT (VOLCANIC ASH)
GRAIN-SIZE ANALYSIS (% Passing)		
Sieve		
1-1/2"		
1"		
1/2"		
#4		
#10		
#20		
#40		
#100		
#200		
ATTERBERG LIMITS		
Air Dried or Natural	NATURAL	NATURAL
Liquid Limit	213	360
Plastic Limit	106	163
Plasticity Index	107	197
Dilatancy	RAPID	RAPID
Toughness	WEAK & SOFT	WEAK & SOFT
Dry Strength	LOW	LOW
UNIFIED SOIL CLASSIFICATION	MH	MH
APPARENT SPECIFIC GRAVITY		
CBR TEST		
(Surcharge - 51 P.S.F.)		
Molding Moisture, %		
Molding Dry Density, P.C.F.		
Swell upon saturation, %		
CBR at 0.1" Penetration		
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method ___)		
Dry to Wet or Wet to Dry		
Max. Dry Density (P.C.F.)		
Optimum Moisture (%)		

REMARKS:

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 6.6.77 By CM

PUUEO PROJECT - INCREMENT 1

TABLE I D - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	3	P-1	P-2
	C	SURFACE	SURFACE
DEPTH BELOW SURFACE	50:6.8'		
DESCRIPTION	MOTTLED BROWN CLAYEY SILT (VOLCANIC ASH)	BROWN SANDY GRAVEL W/CLAYEY SILT (VOLCANIC ASH)	BROWN SANDY GRAVEL W/CLAYEY SILT (VOLCANIC ASH)
GRAIN-SIZE ANALYSIS (% Passing)			
Sieve		94.4	81.5
1-1/2"		87.6	77.2
1"		77.6	68.0
1/2"		57.1	61.9
#4		46.9	53.5
#10		38.1	53.3
#20		32.5	48.6
#40		25.5	38.9
#100		22.7	33.5
#200			
ATTERBERG LIMITS			
Air Dried or Natural		NATURAL	NATURAL
Liquid Limit	244	83	123
Plastic Limit	119	50	76
Plasticity Index	125	33	47
Dilatancy	RAPID	RAPID	SLOW
Toughness	WEAK & SOFT	WEAK & SOFT	WEAK & SOFT
Dry Strength	LOW	LOW	MEDIUM
UNIFIED SOIL CLASSIFICATION	MH	GM	GM
APPARENT SPECIFIC GRAVITY			2.71
CBR TEST			
(Surcharge - 51 P.S.F.)		22	49
Molding Moisture, %		105	71
Molding Dry Density, P.C.F.		0.1	0.4
Swell upon saturation, %		3.5	2.7
CBR at 0.1" Penetration			
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)			
Dry to Wet or Wet to Dry			
Max. Dry Density (P.C.F.)			
Optimum Moisture (%)			

REMARKS:

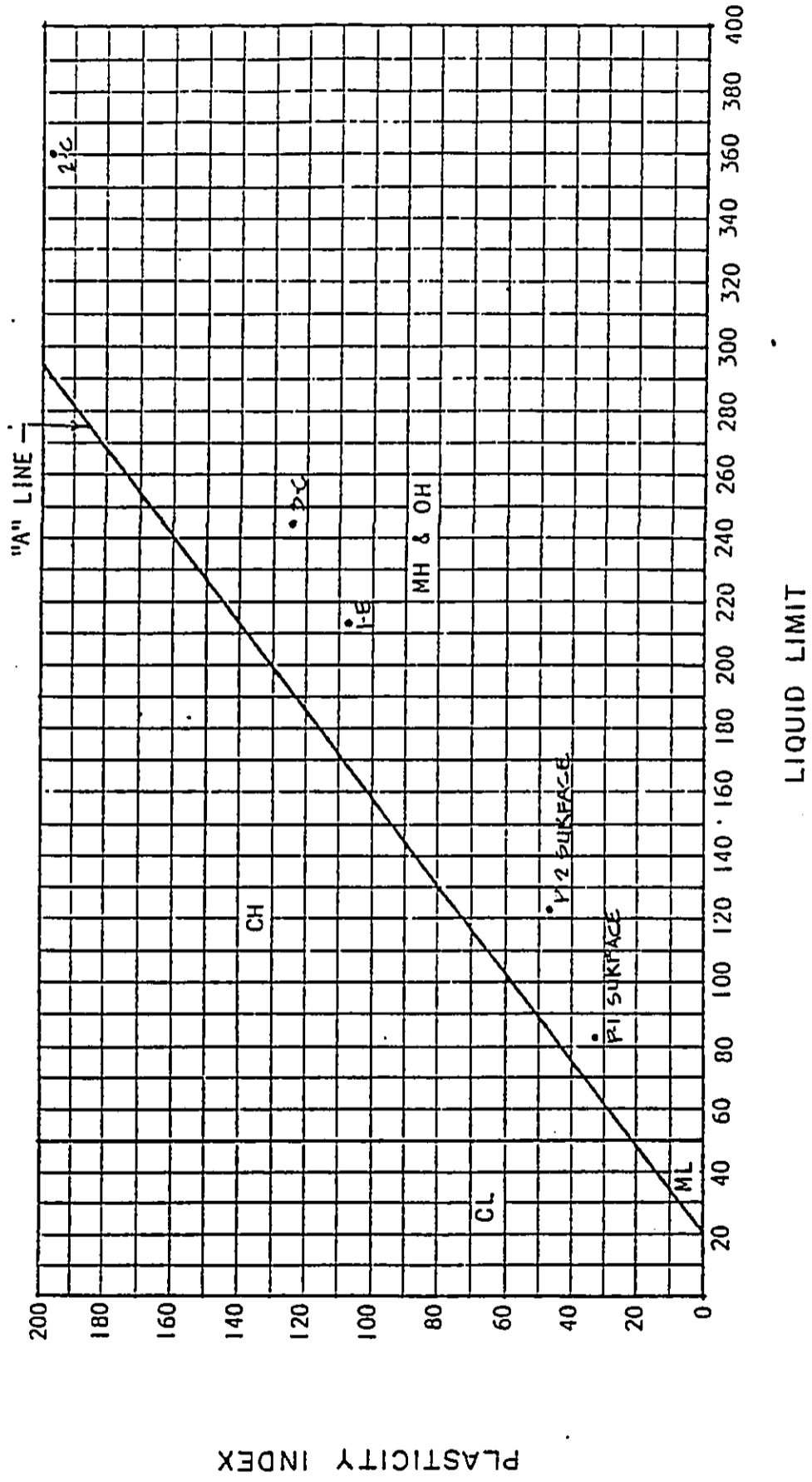
WALTER LUM ASSOCIATES, INC.
CIVIL STRUCTURAL SOILS ENGINEERS

Date 6-6-77 By CM

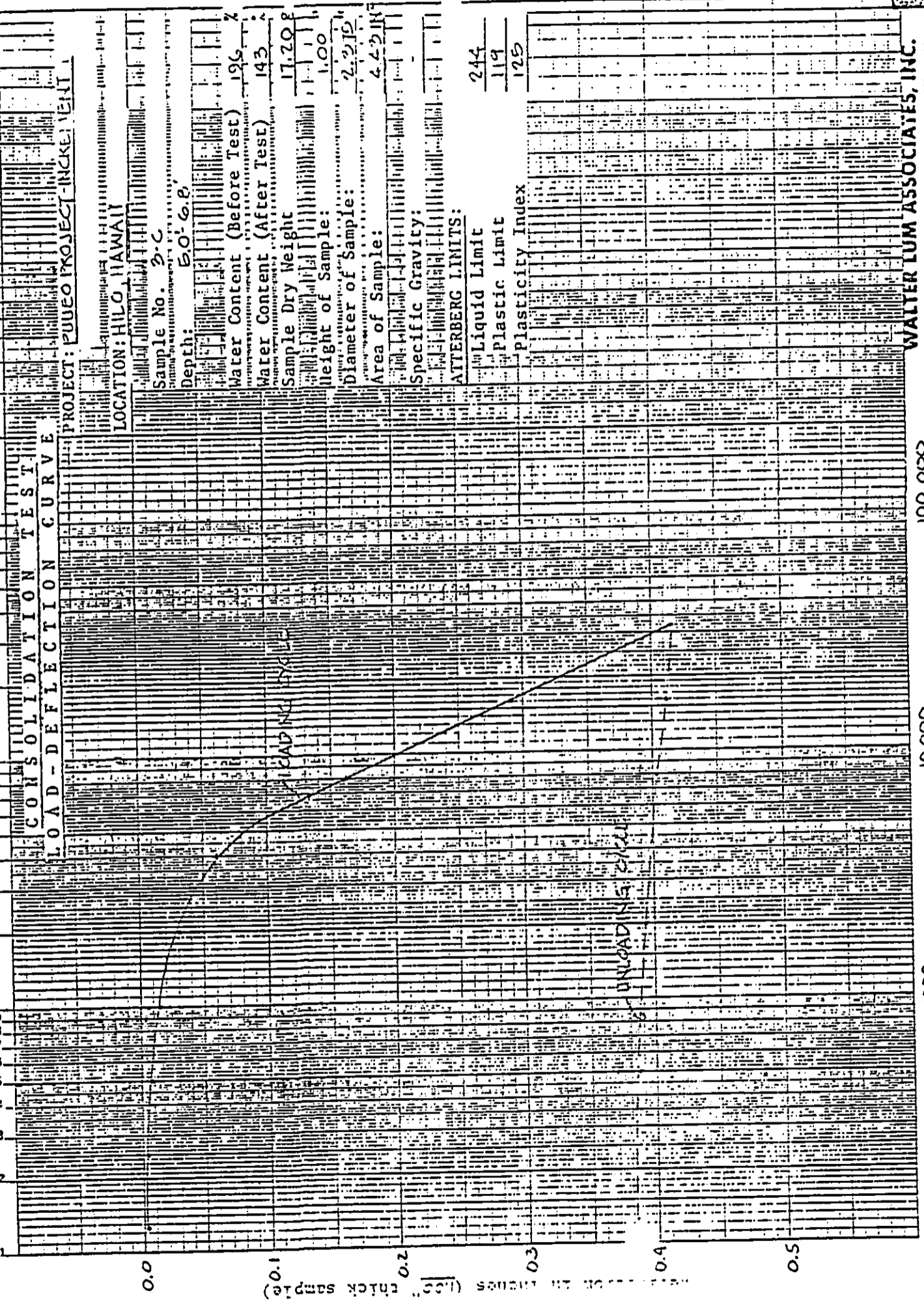
PLASTICITY CHART

PROJECT: PUUEO PROJECT INCREMENT I

LOCATION: HILO, HAWAII



DATE 6.1.77 BY CM



PROJECT: PUUEO PROJECT - INCKET VERT 1

LOCATION: HILO, HAWAII

Sample No. 3-C

Depth: 50' 6.8'

Water Content (Before Test) 196%

Water Content (After Test) 143%

Sample Dry Weight 17.70 g

Height of Sample: 1.00

Diameter of Sample: 2.375

Area of Sample: 4.42 IN²

Specific Gravity: _____

ATTERBERG LIMITS:

Liquid Limit 244

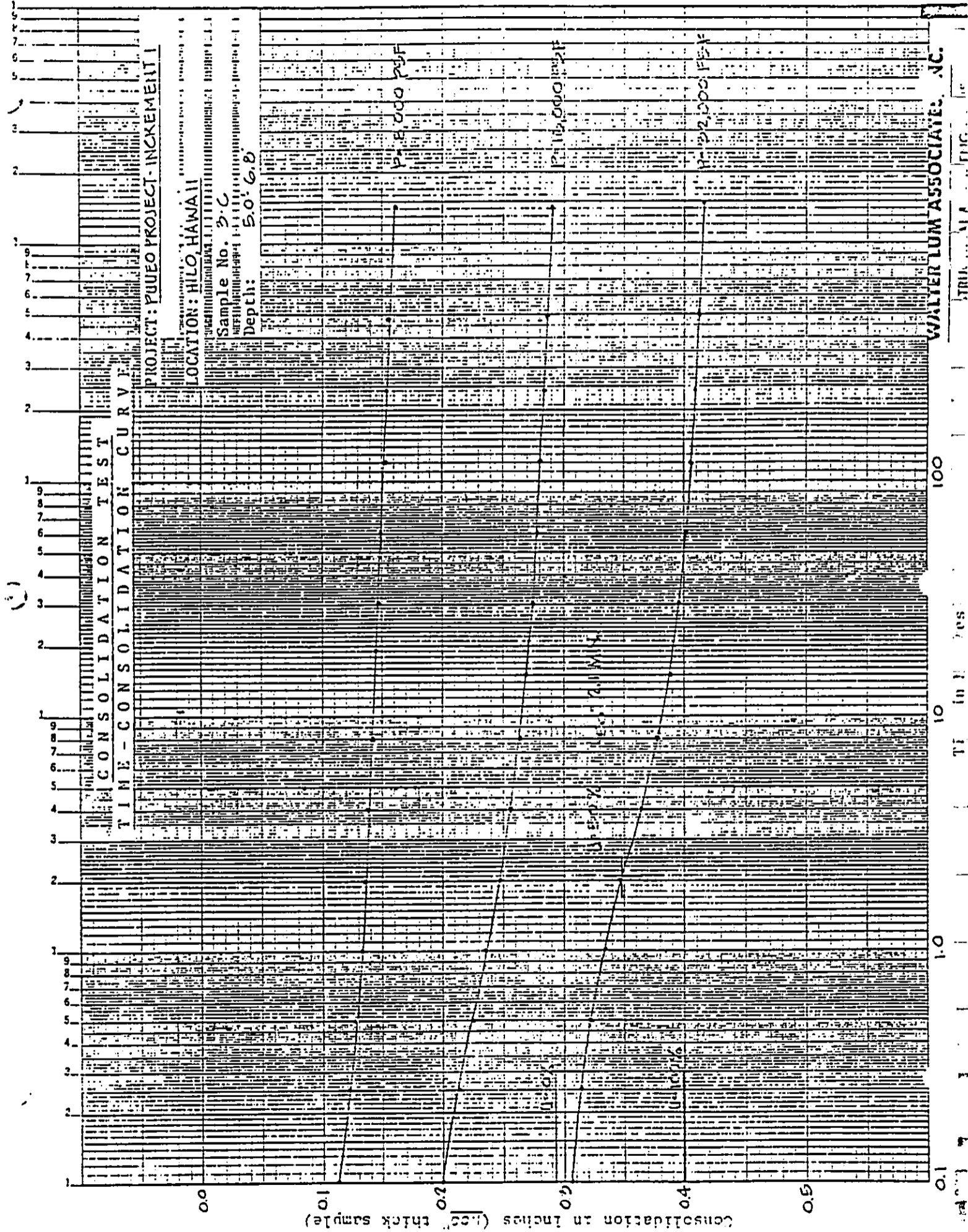
Plastic Limit 119

Plasticity Index 125

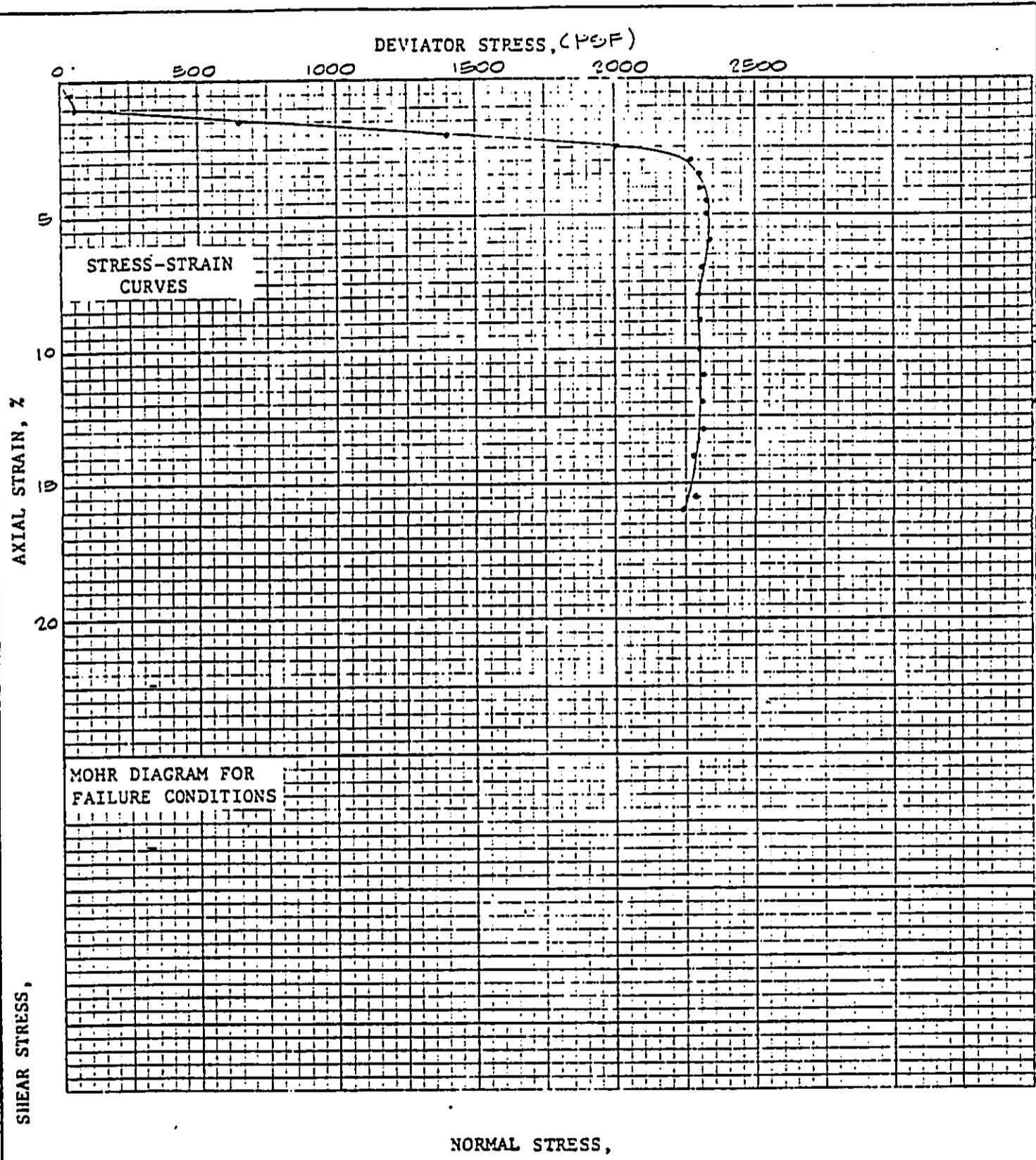
WALTER LUM ASSOCIATES, INC.

STRUCTURAL & SOIL ENGINEERS

5-1273

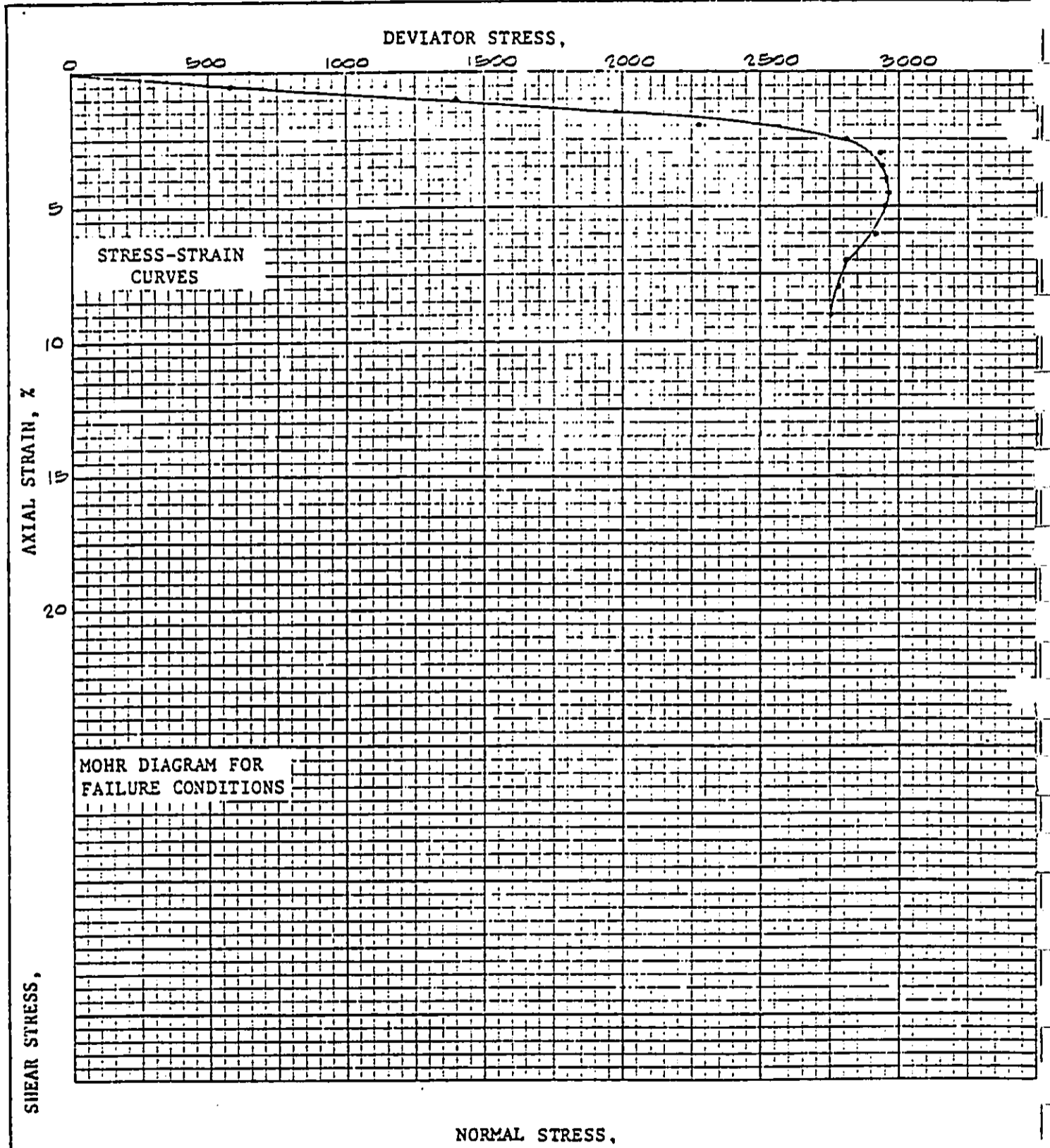


DOCUMENT CAPTURED AS RECEIVED



SAMPLE DESCRIPTION		SAMPLE SIZE	ATTERBERG LIMITS		REMARKS					
BROWN CLAYEY SILT (VOLCANIC ASH) w/ SOME ROUNDED GRAVEL		2 1/8" x 6"	LL =	PL =	PUUEO PROJECT - INCREMENT I Hilo, Hawaii					
KEY	CORNO SAMPLE NO.	DEPTH	TEST TYPE	LATERAL PRESSURE PSF	DEVIATOR STRESS PSF	WATER CONTENT, %		DEGREE OF SATURATION, %		AXIAL STRAIN %
						INITIAL	FINAL	INITIAL	FINAL	
	2	3.0 TO 7.0'	Q	720	2360	216	-	-	-	4.5
TEST TYPE										
"Q" UNCONSOLIDATED-UNDRAINED										
ALTER LUM ASSOCIATES, INC.										

DOCUMENT CAPTURED AS RECEIVED



SAMPLE DESCRIPTION					SAMPLE SIZE	ATTERBERG LIMITS	REMARKS					
MOTTLED BROWN CLAYEY SILT (VOLCANIC ASH)					2 7/8" x 6"	LL = 244 PL = 119 PI = 125	PUUEO PROJECT - INCREMENT I Hilo, Hawaii					
KEY	BORING NO.	SAMPLE NO.	DEPTH	TEST TYPE	LATERAL PRESSURE P.S.F.	DEVIATOR STRESS P.S.F.	WATER CONTENT, %		DEGREE OF SATURATION, %		AXIAL STRAIN %	TEST TYPE
	3	C	5.0' to 6.8'	Q	1440	2960	249	-	-	-	4.5	"Q" UNCONSOLIDATED-UNDRAINED
WALTER LUM ASSOCIATES, INC.												

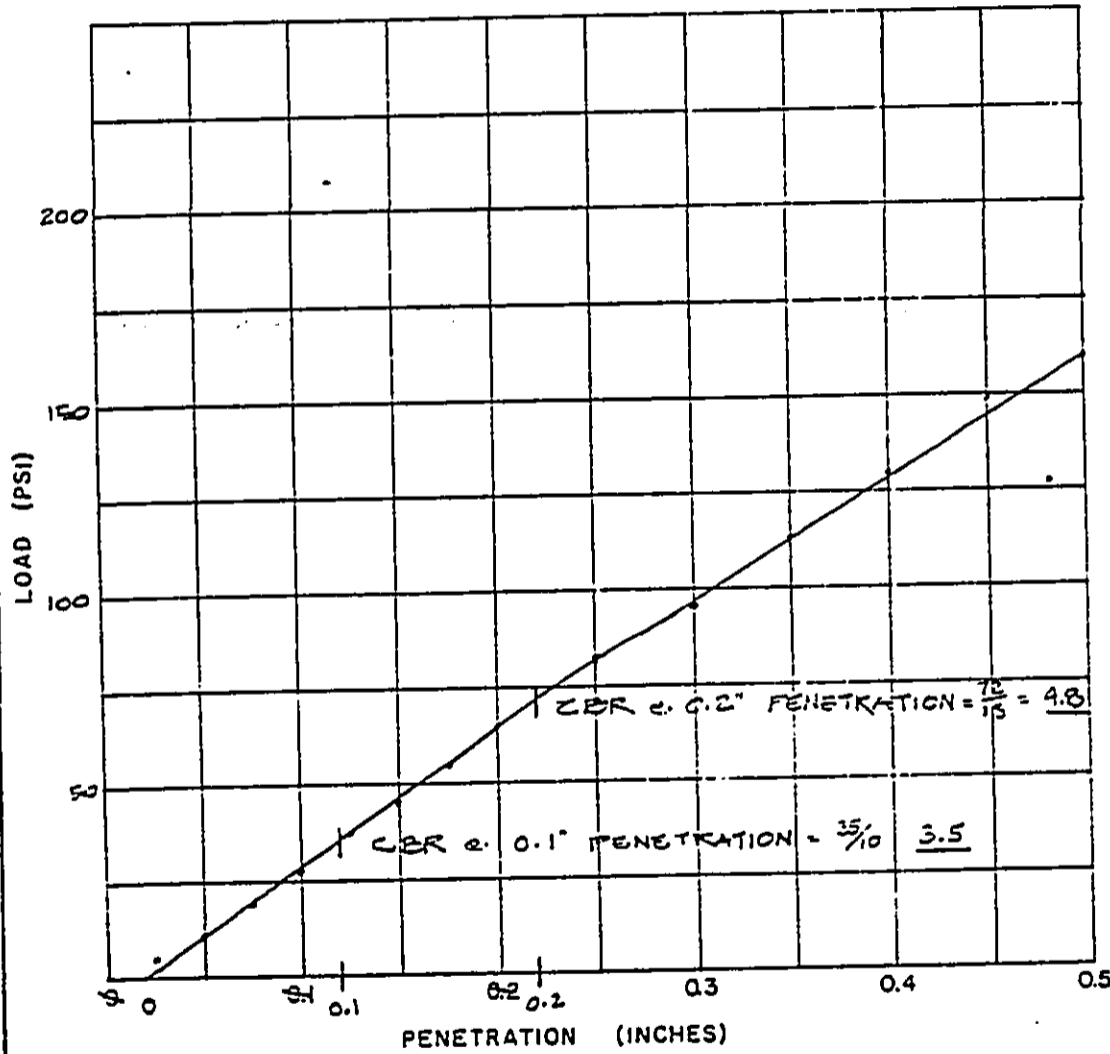
CBR TEST

PROJECT: PUUEO PROJECT-INCREMENT 1

LOCATION: HILO, HAWAII

SAMPLE NO: P-1 SURFACE

SAMPLE DESCRIPTION: BROWN SANDY GRAVEL W/ CLAYEY SILT (VOLCANIC ASH)



CBR PENETRATION DATA

PENETRATION (INCHES)	LOAD (LBS)	LOAD (PSI)
0.025	15	5
0.050	34	11
0.075	57	19
0.100	80	27
0.125	110	37
0.150	136	45
0.175	165	55
0.200	195	65
0.250	245	82
0.300	285	95
0.350	338	113
0.400	390	130
0.450	444	148
0.500	481	160

AGGREGATE 3/4" MINUS
 HAMMER WEIGHT 10 LBS
 HAMMER DROP 15 IN
 No. OF BLOWS 56/LAY. 2
 No. OF LAYERS 5

TEST RESULTS:

MOLDING MOISTURE, % 21.8

MOLDING DRY DENSITY, P.C.F. 105

CBR @ 0.1" PENETRATION 3.5

DATE 5-31-77 BY C.S.

DATE 6-2-77 BY C.S.

WALTER LUM ASSOCIATES, INC.
 CIVIL, STRUCTURAL SOILS ENGINEERS

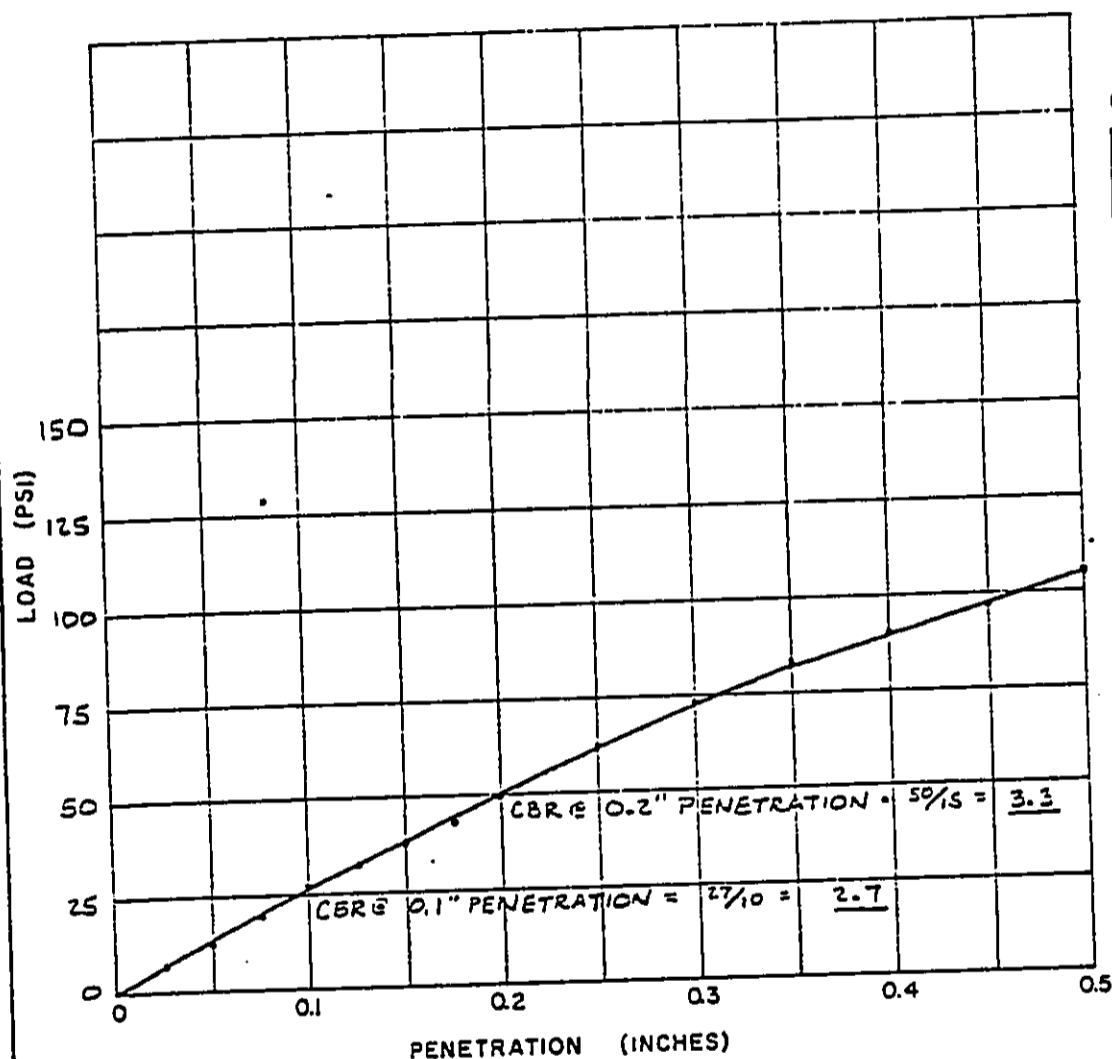
CBR TEST

PROJECT: PUUEO PROJECT - INCKEMENT 1

LOCATION: HILO, HAWAII

SAMPLE NO: P.2 SURFACE

SAMPLE DESCRIPTION: BROWN SANDY GRAVEL W/CLAYEY SILT (VOLCANIC ASH)



CBR PENETRATION DATA

PENETRATION (INCHES)	LOAD (LBS)	LOAD (PSI)
0.025	20	7
0.050	40	13
0.075	60	20
0.100	80	27
0.125	100	33
0.150	115	38
0.175	130	43
0.200	150	50
0.250	185	62
0.300	220	73
0.350	250	83
0.400	270	90
0.450	290	97
0.500	315	105

AGGREGATE 3/4" MINUS
 HAMMER WEIGHT 10 LBS
 HAMMER DROP 18 IN
 No. OF BLOWS 56 / 1.12
 No. OF LAYERS 5

TEST RESULTS:

MOLDING MOISTURE, % 49.0

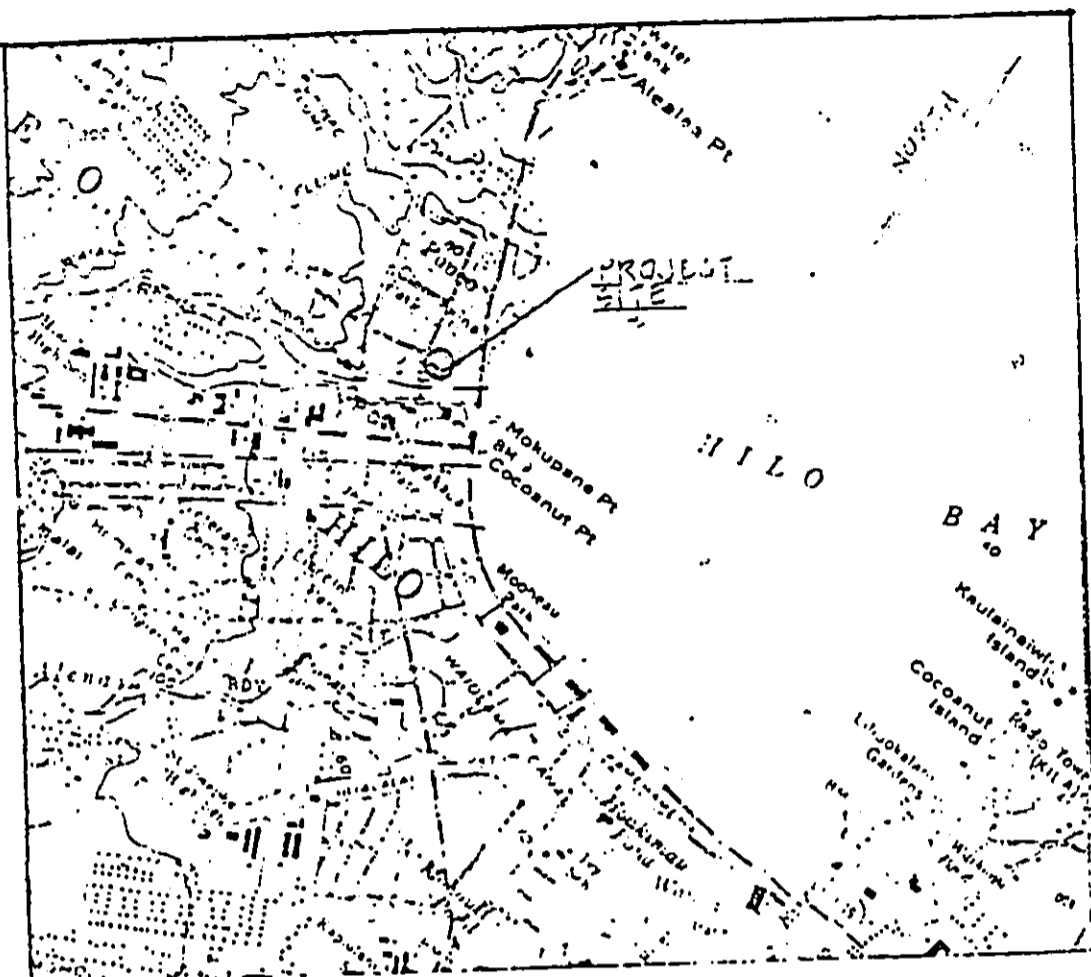
MOLDING DRY DENSITY, P.C.F. 70.6

CBR @ 0.1" PENETRATION 2.7

DATE 5-31-77 BY C.S.

DATE 6-2-77 BY C.S.

WALTER LUM ASSOCIATES, INC.
 CIVIL, STRUCTURAL, SOILS ENGINEERS



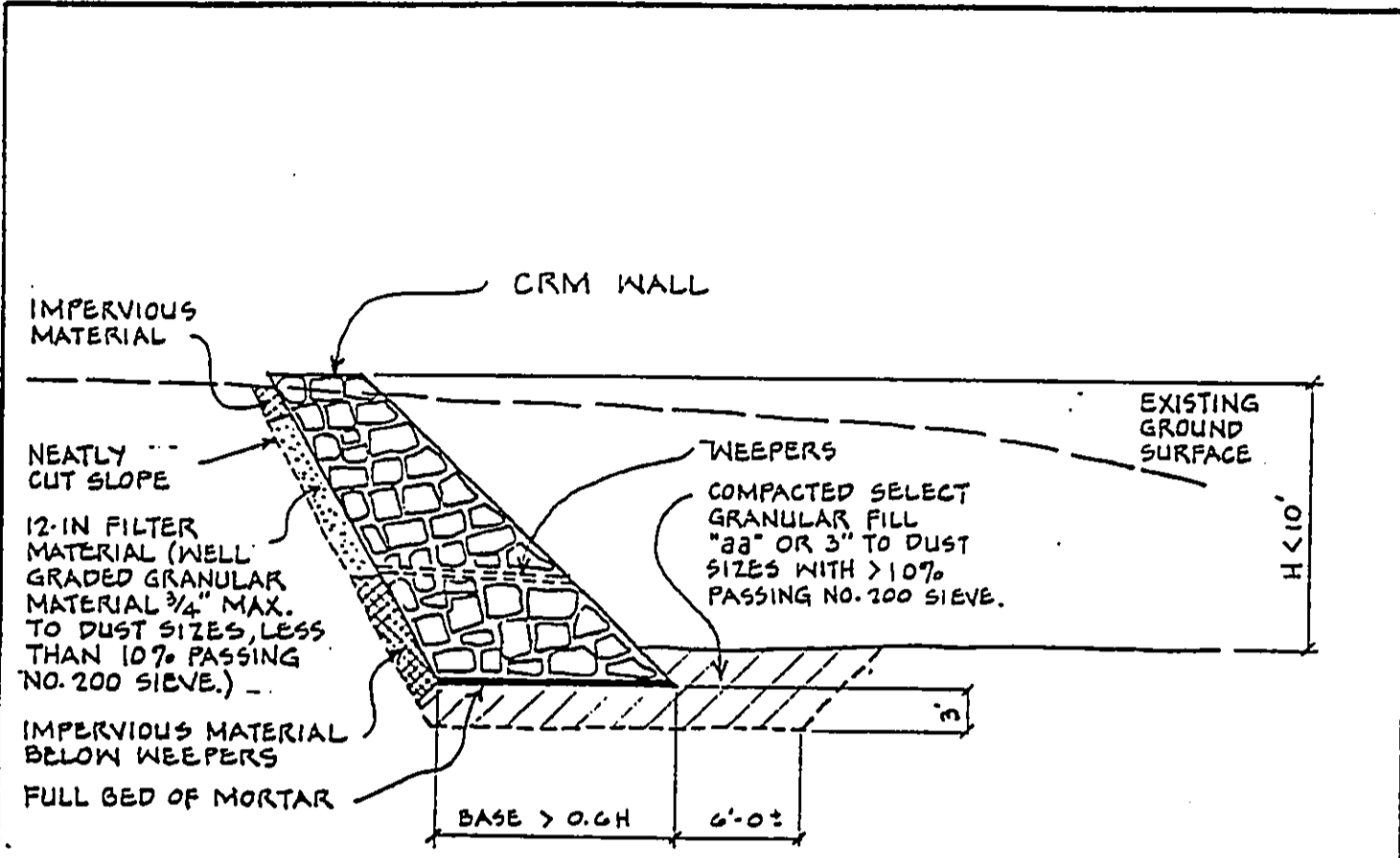
PROJECT LOCATION SKETCH
NOT TO SCALE

LEGEND

- ⊙ BORING
- ✦ PROBING

BORING LOCATION SKETCH
PUBCO PROJECT-INCREMENT 1
HILO, HAWAII
TAX MAP KEY: 2-6-02:1 & 2

Dr. _____	WALTER LUM ASSOCIATES, INC. 135 NORTH AVENUE CIVIL ENGINEERS HONOLULU, HAWAII 96813	
Date: 6/77		18
Rev: _____		



SCHEMATIC SECTION
NOT TO SCALE

FIGURE 1
RETAINING WALLS FOR PARKING LOT
PUEO PROJECT-INCREMENT 1
HILO, HAWAII

WALTER LUM ASSOCIATES, INC.
CIVIL STRUCTURAL SOILS ENGINEERS
JUNE, 1977

LIMITATIONS

In general, soil formations are commonly erratic and rarely uniform or regular. The boring logs indicate the approximate subsurface soil conditions encountered only at the drill holes where the borings were made at the times designated on the logs and may not represent conditions between borings, at other locations, or at other dates. Soil conditions and water levels may change with the weather, passage of time and construction methods or improvements at the site.

During construction, should subsurface conditions much different from those in the borings be observed, encountered, or otherwise indicated, we should be advised immediately to review or reconsider our recommendations in light of the new developments.

If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes, plan changes, or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the recommendations considering the time lapse, changed conditions, and changes in the state of the art of soil engineering.

Our professional services were performed, findings obtained and recommendations prepared in accordance with generally accepted engineering practices. This warranty is in lieu of all other warranties expressed or implied.

LIMITATIONS (cont'd.)

Contract documents and specifications often prescribe supervision by the soil engineer. It should be understood by all parties that the soil engineer's actual scope of work is very limited. We as the soil engineer do not assume the day to day physical direction of the works, nor minute examination of the elements, nor do we assume the responsibility for the safety of the contractor's workmen. Supervision, inspection, control, etc., by the soil engineer generally mean taking of soil tests and making visual observations, sometimes on only an intermittent basis relating to earthwork or foundations for the project. The soil engineer does not guarantee the contractors' performance, but rather looks for general conformance to the intent of the plans and soil report. Any discrepancy noted by the soil engineer regarding earthwork or foundations will be referred to the project engineer or architect or contractor for action.

Although the soil report may comment or discuss construction techniques or procedures for the design engineer's guidance, the report should not be interpreted to prescribe or dictate construction procedures or to relieve the contractor in anyway of his responsibility for the construction.



Mark Saito
Consulting Engineer

GEOGRAPHIC LOCATION AND PERTINENT FACTS ABOUT
THE STATE OF HAWAII

The Hawaiian Islands were created by the action of volcanoes. They were formed by the oozing of basaltic lava from the floor of the Pacific Ocean. The lava built up in successive layers to peaks rising above the ocean waters. These peaks are the islands of Hawaii.

There are 122 islands, reefs and shoals in the Hawaiian group. The chain as a whole extends nearly 2,000 miles to a northwest-southeast direction, along the great fault in the earth's surface running from California to Japan.

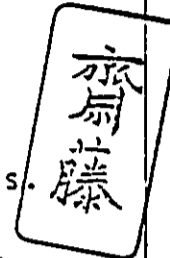
There are eight major islands, seven inhabited. Four of the 114 minor islands are inhabited. The principal islands are Hawaii, Oahu (Honolulu and Pearl Harbor), Maui, Molokai, Kauai, Lanai, Niihau, and Kahoolawe (Uninhabited).

The islands of Hawaii were first populated by Polynesians, a proud, tan people believed to have originated in India and Asia Minor. Early migration took them south into the island groups between Sumatra and Luzon (Philippines). They made organized expeditions into the Pacific Ocean during the first few centuries of the Christian era.

Through intermarriage with other races met during their travels the Polynesians became a thoroughly mixed race. They reached the Hawaiian Islands, most likely by way of Tahiti, in or before the sixth century A.D.

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

Blessed with plentiful sunshine, cooled by the Pacific trade winds, the Islands of Hawaii have a balmy climate. The average temperature ranges from 72 degrees in February to 79 degrees in August. Temperatures vary widely by area, occasionally dropping into the 20's atop the highest peaks. Temperatures in Honolulu range from a low of 57 degrees to a high of 97 degrees.



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Most electric power in Hawaii is produced by steam or diesel generators. A negligible amount is generated by hydroelectric power in Kauai and Hawaii Counties.

The Honolulu Gas Company and its branches supply gas for the Islands. There is no natural gas supply in Hawaii. Gas piped to urban areas on Oahu, Maui, and Hawaii is manufactured by high temperature burning of a residual petroleum product brought from the Mainland. Propane gas, in bulk or cylinders, is available in most areas.

The Hawaiian Telephone Company is a subsidiary of General Telephone and Electronics Corporation. They are a participating company in the Communications Satellite Corporation, which operates the world-wide "Cosmat" communications system through manmade satellites orbiting in space. One of the satellite ground stations is located on Oahu. The station has already made it possible for Hawaii to receive "live" television from the Mainland.

The Hawaiian Telephone Company provides telephone service for all of Hawaii. A total of 627,848 telephones were in service at the end of 1977, an increase of ten percent over the end of 1975. Of the 567,685 telephones in service at the end of 1975, 431,437 were in the County of Oahu, 50,090 were in the County of Hawaii, 33,131 in the County of Maui, and 20,851 in the County of Kauai. [1]

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

More than 90,900 jobs are provided by the wholesale/retail trade throughout Hawaii in 1977.^[2] The State Tax Office reports that the total retail sales for 1976 in the State were \$3.7 billion, a 9% increase from 1975.^[3]


Complete shopping centers are numerous in Hawaii, and the number is growing as new suburban subdivisions spring up. The four-level Ala Moana Shopping Center in Honolulu, now enlarged, is probably the largest in the world. Supermarkets and department stores in the State offer national brands of merchandise as well as many Hawaiian and Asian products.

National firms having branch stores in Hawaii include: Sears, Roebuck and Company (their largest retail store), GEM, Kress, J.C. Penny, F.W. Woolworth, Safeway, Long's Drug, Hartfields, Leeds, Chandler's Thom McAn, Liberty House, and others.

The State of Hawaii had 3,433,667 visitors who stayed overnight or longer in 1977. This is a 12% increase over 1976. One factor that made this increase possible was the great increase of package tours from Japan which are more than offsetting the gradual declining of military R & R (Rest and Recuperation) program.^[4]

The tourist industry is beginning to take over the lead in the growth rate of revenue producing industries. With the new capacity of airlines and airline deregulation, the lowering of fares, and the rising of national and international economy, more people are traveling and are able to visit the "Islands of Paradise". Now resort areas are being opened on all of the major islands. Waikiki, in Honolulu, is still the most popular visitor's destination, but more and more people are visiting the outer islands also.

Hawaii now has two airports that can handle the large jumbo jet aircraft, the International Airport in Honolulu and


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Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

the new and expanded airport at Hilo, on the Island of Hawaii. A new inter-island jet strip has been built in North Kona on the Island of Hawaii, it was opened and dedicated in July, 1970. Presumably, this will alleviate some of the congestion at the Honolulu terminal.

Rainfall also varies widely. Average yearly rainfall in downtown Honolulu is 24 inches, 140 inches at Hilo (Island of Hawaii), and 472 atop Waialeale, a mountain on the Island of Kauai.

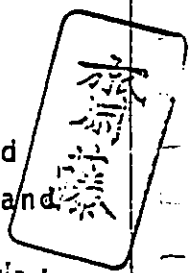
However, the climate in the most populous areas is pleasantly subtropical. Such climate together with Hawaii's lush scenery provide the setting for "Island Living" -- a phrase connoting the recreational and cultural amenities which ease the rather strenuous work-a-day pace of the people.

For recreation Hawaii offers almost countless, matchless beaches for safe swimming, surfboarding and surf fishing, outrigger canoe riding, water skiing -- or just lazing in the sun. There are an increasing number of pleasant parks for games, picnics, or unabashed loafing.

The 1977 de facto population of the State of Hawaii, is 964,900 according to the State Department of Planning and Economic Development. Some 81% of these persons live on the Island of Oahu, in the City and County of Honolulu.

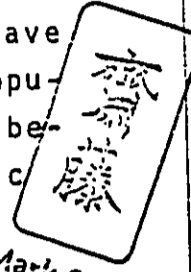
Approximately 58,700 military are stationed in Hawaii, with some 63,700 military dependents as of July 1, 1977.^[5] They are included in the resident population. All but a few hundred servicemen and dependents live on Oahu, where the major military bases are located.

The population of Hawaii has increased an annual average of 2.78% for the period of 1970 to 1977, an increase of


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Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

124,787. Most of this increase has been in the City and County of Honolulu. Maui, Kauai, and Hawaii Counties have enjoyed moderate increases. It is expected that the population of the Neighbor Islands has started to increase because of the increases in new resorts and other economic developments. [6]



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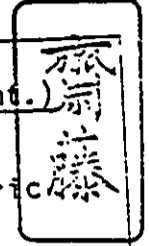
The people of Hawaii are of many racial extractions and mixtures. Everyone in the islands is a member of a minority group, since no one race is in the majority. About two-fifths of the population is Caucasian, "Haole". About one-fourth is of Japanese descent. The combined total of Hawaiian and part-Hawaiian comprise about fifteen percent of the total population. The remaining 18% is comprised of Chinese, Korean, Filipino, and many others as well as those of racial mixtures or Cosmopolitans. Island people are proud of their mixed ancestry, and of the racial harmony that exists in Hawaii. [7]

There are eight banks doing business in Hawaii. They operate more than 168 branches throughout the State, and also on Guam, Kwajalein, and the Caroline Islands. [8]

Fifteen savings and loan associations are in operation on Oahu and on the Neighbor Islands. A large number of loan (consumer finance) companies operate throughout the State. They are both locally owned and branches of Mainland Companies. [9]

Electric power in Hawaii is provided by public companies operating in each county. Honolulu is served by Hawaiian Electric Company. Hilo Electric Company serves Hawaii County. Kauai County is served by Kauai Electric Company. Maui Electric Company, Molokai Electric Company and Lahaina Light and Power Company serve Maui County.

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)



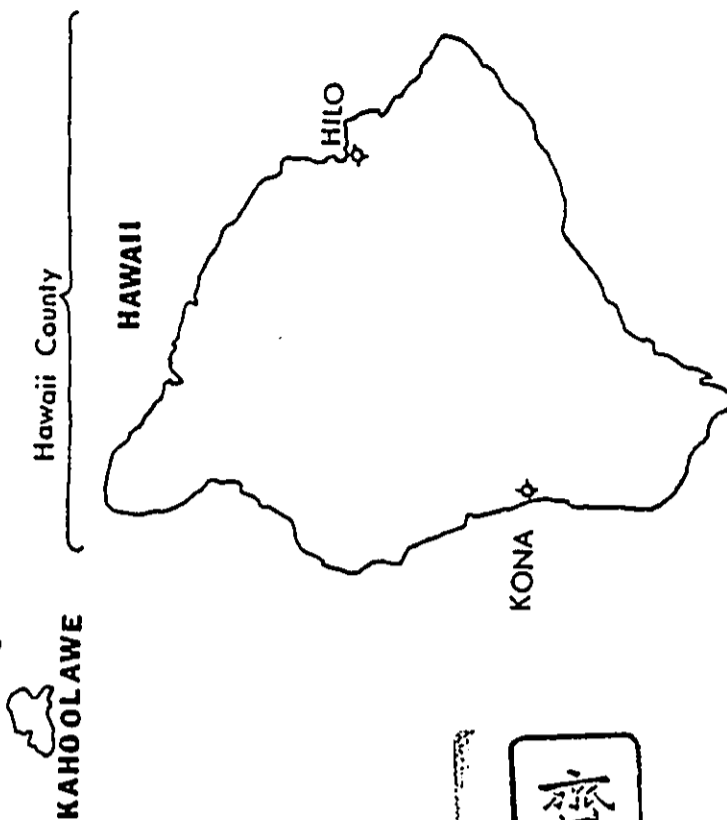
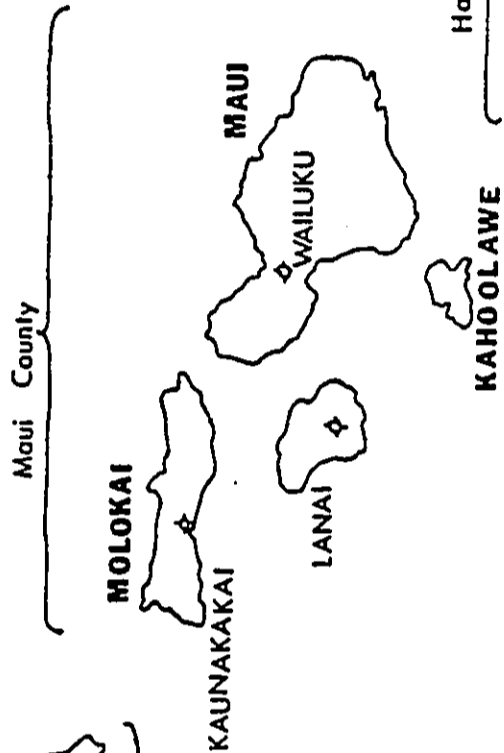
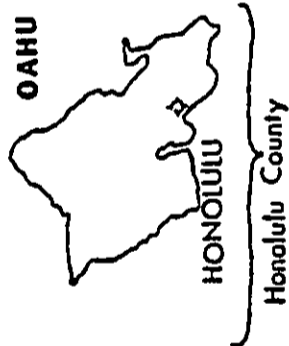
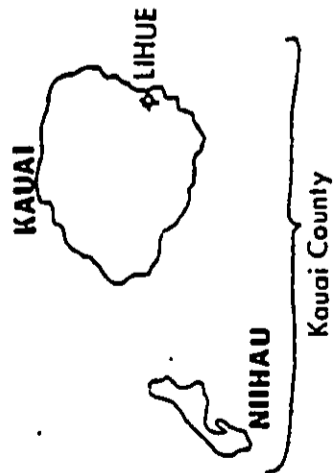
Some plantations and military installations produce electric power for their own use.

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Hawaii's highway program is progressing, but it is difficult to keep up with the demand and need. On the Island of Oahu H-1, the largest undertaking is under construction. Some segments have been completed and are in use. On the Outer Islands some of the highways are fairly new. None of the Neighbor Islands, as yet, have a highway which completely circles the island. When new highways and roads are opened, the surrounding areas begin to develop.

Hawaii is fast becoming the financial and educational center of the Pacific linking the "East" with the "West", cementing better relations with our Asian neighbors who are becoming more involved in our economy.

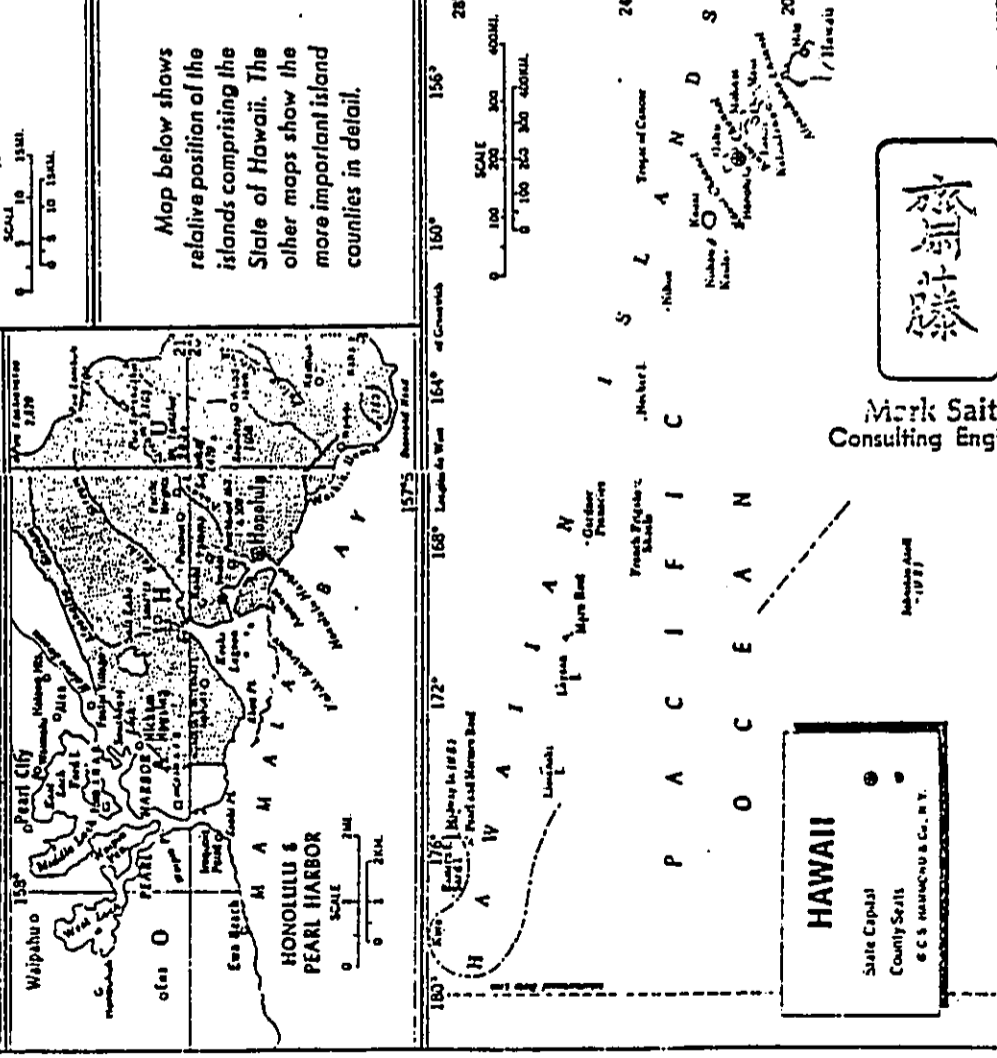
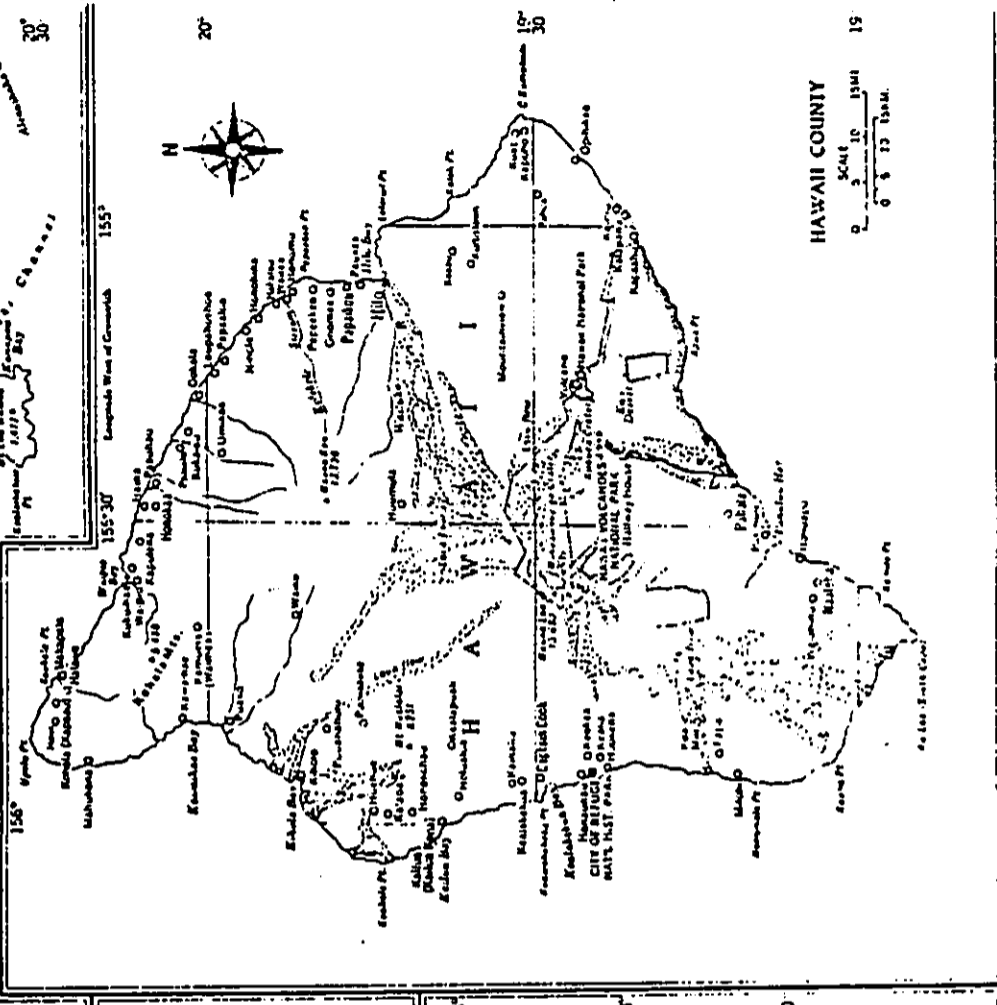
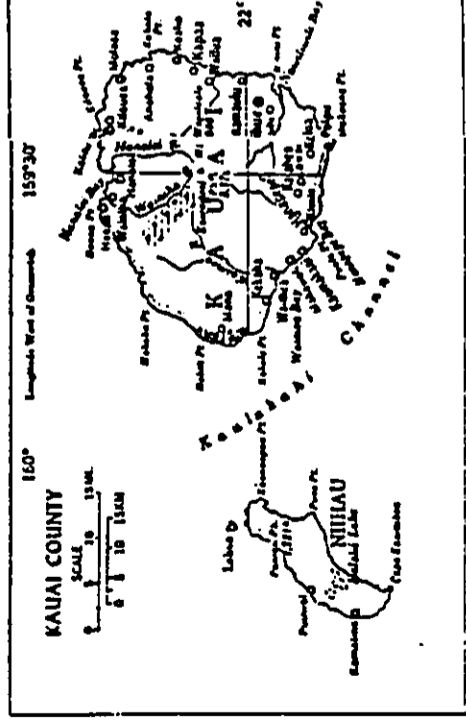
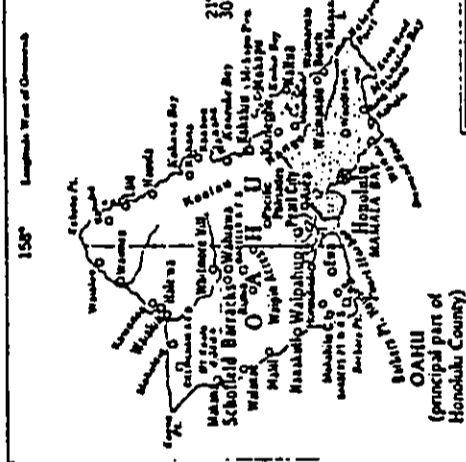
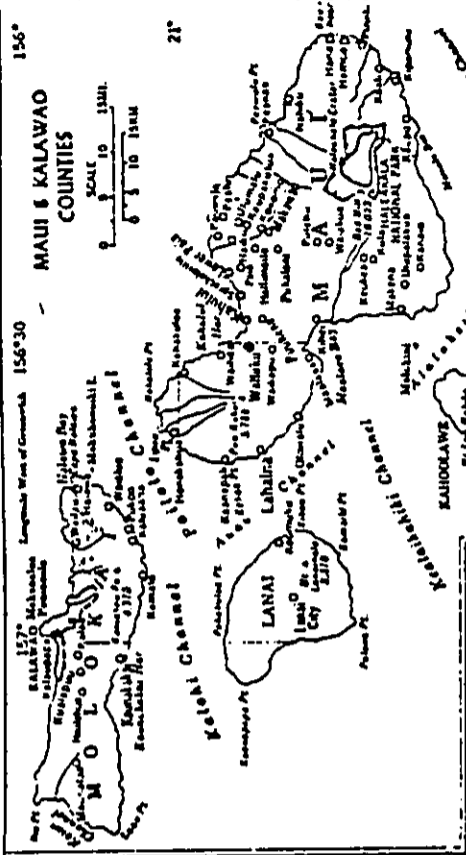
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- [1] Source: Hawaiian Telephone Company
 - [2] Source: Bank of Hawaii Annual Report
 - [3] "Hawaii Facts & Figures", The Chamber of Commerce of Hawaii
 - [4] Ibid
 - [5] Ibid
 - [6] State of Hawaii, Department of Planning and Economic Development,
"The State of Hawaii — Data Book"
 - [7] Ibid
 - [8] "Hawaii Facts and Figures", The Chamber of Commerce of Hawaii
 - [9] Ibid



State of HAWAII

EXHIBIT A

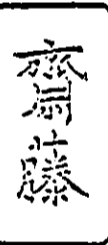

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HAWAII COUNTY
SCALE
0 5 10 15
0 5 10 15

HAWAII
State Capital
County Seats
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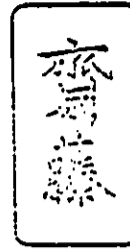
P A C I F I C
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Consulting Engineer

COUNTY OF HAWAII ANALYSIS
ISLAND OF HAWAII

The County of Hawaii encompasses the Island of Hawaii, which is the southeasternmost and largest island of the Hawaiian archipelago. Commonly referred to as the "Big Island," the land area of the Island of Hawaii with its 2,584,320 acres or 4,038 square miles is nearly twice the combined size of all the other islands of the state.

The Island of Hawaii is a land of diverse climate, topography, and scenic beauty. Environments range from the dense tropical forests to majestic snow-capped mountains. There are active volcanoes, black, white, and green sand beaches, deeply eroded valleys, and large expanses of grazing land.

The Island may have been the first of the group to be inhabited by the Polynesians. Tracings which date back to 750 A.D. have been found in the South Point area. Captain James Cook, the first European to set foot in Hawaii, met his death at Kealahou Bay in 1779. The Hawaiian monarch who united all Hawaii under one rule, Kamehameha the Great, was born in Kohala and died in Kona. The entire island is rich in historical lore.

Throughout the County's history, agriculture has played an important economic role. After many economic ventures and experiments, sugar production and cattle ranching emerged as leaders of the modern agricultural industry. In recent years

County of Hawaii Analysis (continued)

other forms of diversified agriculture, principally macadamia nuts, papaya, and flowers, have experienced substantial growth. Most manufacturing concerns on the Island are closely associated with the agricultural industry.


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Consulting Engineer

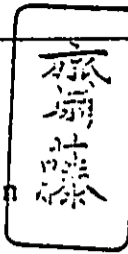
In the past two decades a new major industry, tourism, has emerged. Much of the economic growth experienced during this period can be linked with the expansion of the visitor industry.

POPULATION

The County's population, numbering approximately 78,200 in 1977, consists of people from various ethnic backgrounds. No majority ethnic grouping is found on the island. This can be seen in the following percentages of ethnic backgrounds represented: Japanese, 39.9%; Caucasian, 15%; Filipino, 9.6%; Hawaiian, 2.6%; Puerto Rican, 1.9%; Chinese, 1.2%; Part Hawaiian, 18.9%; Cosmopolitan and others not reported, 10.9%. This diversity is largely the result of the practice started by the sugar plantations over a century ago of importing immigrant workers. The first laborers were the Chinese, followed by the Japanese and the Portuguese, and more recently, the Filipinos. The plantations had and still exert a large influence on the economic and social lives of many Big Islanders.

The 1970 census count of population was the first to show an increase of people in the County since 1930. Population in modern history peaked at 73,325 during that year, largely the result of importing labor into the island. After World War II, however, plantations began an intensive program of mechanization which substantially reduced the demand for labor. Since there were few alternative forms of economic or educational opportunities, a sizeable out-migration of residents, especially the younger segment of the population,

County of Hawaii Analysis (continued)



occurred between 1940 and 1960. This was reversed between 1960 and 1970.

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The out-migration between 1940 and 1960 left a serious imbalance in the age-sex distribution of the island's population which was first reflected in the 1960 census. There were about 7,000 fewer people between the ages of 15 and 34 in 1960 than in 1950. The 1970 census, however, showed a gain of 1,940 residents in this age group.

Because of the increasing number of residents above 54 years old, the median age of the Big Island's population increased from 27.4 years old in 1960 to 29.2 years in 1970. Effects of the plantations' practice of importing male workers can be seen in the sex distribution of the population. In 1970 there were 108 males for every 100 females. The ratio between men and women has since been balancing out.

Resident population in 1970 for the urban areas of the Island of Hawaii were: Hilo 26,353; Papaikou 1,888; Pahala 1,507; Captain Cook 1,263; Naalehu 952; Keaau 951; Pahoa 924; and Waimea 756.

Resident population in 1970 by districts for the Island of Hawaii were: Puna 5,154; South Hilo 33,915; North Hilo 1,881; Hamakua 4,648; North Kohala 3,326; South Kohala 2,310; North Kona 4,832; South Kona 4,004; and Ka'u 3,398.

CLIMATE

Although the Island of Hawaii's climate is diverse because of the terrain, there is very little seasonal variation. The average annual temperature is 70 degrees Fahrenheit on the Big Island. The coldest month is February with an average temperature of 68 degrees; warmest months are August and September, with average temperatures of 73 degrees.

County of Hawaii Analysis (continued)

Rainfall ranges from 90 inches at the Mauna Kea summit to 133 inches at the Hilo Airport. Average annual possible sunshine (percentage of days) is 65%.

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Consulting Engineer

DEVELOPMENT POTENTIAL

Many opportunities for business and development exist for any endeavor which will bolster the economic situation, and consider the welfare of the people. The government encourages, and is willing to assist in, the expansion of industries such as agriculture (and all related industries such as processing, canning, etc.), research and development, visitor industry, ocean-based activities and many others.

The county is studying the feasibility of establishing a business development loan program, and the capital improvements program is working to improve the quality of existing commercial and industrial areas.

HOUSING

In a 1968-69 Land Use Inventory, it was found that of the 19,183 units, 96 percent are occupied by resident households. Although the overall vacancy rate is 4 percent, many of the units are not available because they are seasonal or second homes, or are delapidated. It is reported that approximately 60 percent of the units are owner-occupied and 40 percent are renter-occupied. The inventory indicates that 4.5 percent of the total units are delapidated and 22 percent are in poor or deteriorating condition. Thirty percent of the housing units are more than 30 years old.

As of 1970, the median value of owner-occupied units was \$25,000. For renter-occupied units, the median contract rent was \$56.00.

The average density for Hawaii County is 1.4 dwellings per acre.

County of Hawaii Analysis (continued)

LABOR FORCE

The civilian labor force (ages 16 - 65) for Hawaii County in 1975 consisted of 32,030 people, with 29,280 of these employed. About 8.6 percent of the labor force were unemployed and were seeking jobs. In 1970 the labor force actually included 27,400 potential workers with 26,310 employed.

The major sources of employment in 1970 were in the white-collar work area (38.2 percent), government (18.6 percent), and manufacturing industries (15 percent).

WAGES

Minimum wage for covered employment throughout the state is \$2.65 per hour.

Average monthly salary for typical jobs in 1975 were:

Junior typist	\$588	per	month
Clerk-stenographer	\$657	"	"
Secretary	\$734	"	"

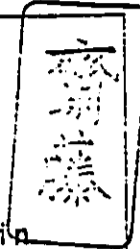
Typical hourly wages were:

Waiter/waitress	\$2.17	per	hour
Laborer (light)	\$3.48	"	"
Carpenter (maintenance)	\$4.90	"	"

AGRICULTURE

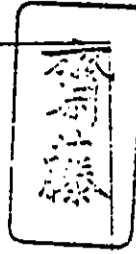
Agriculture is the economic mainstay of the County of Hawaii and has played a major role in the development of the island.

Agriculture, not including related industries such as canning and processing, is a \$95 million business in the County of Hawaii. The island produces more than one-third of the state's agricultural output, including almost all of the papaya and macadamia nuts, over one-third of the sugar, and half of the beef produced in the state.



Mark Saito
Consulting Engineer

County of Hawaii Analysis (continued)



TOURISM

The State of Hawaii has hundreds of thousands of visitors each year. Of these, an average of 43 percent visit the County of Hawaii during their stay. Of all the visitors to the state, 89.9 percent rate Hawaii superior to any other vacation area they had visited.

Mark Saito
Consulting Engineer

The active and inactive volcanoes, beautiful snow-capped mountains, and tropical valleys with sparkling waterfalls on the island of Hawaii, combine to form a beauty unsurpassed anywhere in the world.

In February 1976, there were 6,045 existing units available for occupancy by visitors in the County of Hawaii. An average of 59.9 percent of these were occupied.

There are 3,224 units that are either under construction now, or in the planning stage.

MILITARY

The total of all military personnel on the island in 1976 was 135, with 124 of these stationed on shore and 14 aboard ship. These men and women had a total of 105 dependents on the island.

MANUFACTURING

Most of the manufacturing and industry on the island are related to agriculture. Sugar processing, food processing, and canning make up the biggest percentage of the manufacturing on the island. The processing of coffee, macadamia nuts, meat products, fruits, and vegetables account for the left-over percentage. There are also some small firms which supply building materials such as crushed rock, concrete, and lumber.

County of Hawaii Analysis (continued)

The South Hilo district contains 75 percent of the island's industrially zoned lands, therefore it is the state's leading manufacturing area. This area has an industrial equipment manufacturer, a fertilizer plant, and several timber processing and furniture manufacturing plants.



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RESEARCH AND DEVELOPMENT

To a limited degree, Hawaii County has begun to participate in the research and development industry. There are over 200 people directly employed in this industry in such facilities as the Center for Cross Cultural Research and Training, the Mauna Kea and Mauna Loa Observatories, the University of Hawaii Cloud Physics Laboratory, Hawaii Volcano Observatory, and various agricultural research centers. The University of Hawaii at Hilo has received approval and funding to become a four-year institution and will play an increasingly important role in this industry.

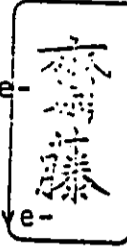
The future of research and development in Hawaii County is bright. The County government works closely with the universities and is exploring several joint programs. This industry, however, is hampered by lack of funding from state and federal governments and research organizations.

TRANSPORTATION

Hawaii County is faced with an increasing demand for the development of new transportation facilities and systems.

County of Hawaii Analysis (continued)

Numerous transportation projects have been recently completed, are underway, or are in the planning stage. Much of the construction underway, however, is expansion or improvement of existing systems and facilities.



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There are two major airports on the island, Hilo (Lyman) Airport and Kona (Keahole) Airport. In 1975, Hilo Airport handled 101,162 passengers coming in and 126,139 going out. They handled 36,934 pounds of mail (both incoming and outgoing).

The island has 1,428.06 miles of road, of which 1,219.22 are paved and the remaining 208.84 are unpaved or being paved.

In 1975, there were 3,480 registered privately-owned cars in the county and 901 registered trucks.

There are two major shipping harbors on the island: Hilo, with a depth of 35 feet, width of 1,400 feet, and length of 2,300 feet; and Kawaihae Harbor, with a depth of 40 feet, width of 1,450 feet, and length of 1,500 feet. Hilo Harbor has 2,600 linear feet of piers and 425,00 square feet of storage area (104,00 square feet are shedded and 321,00 square feet are in the open). With 1,015 linear feet of piers and 94,00 square feet of storage area, Kawaihae harbored 195 inbound vessels in 1974. The same year, Hilo harbored 471 inbound vessels.

County of Hawaii Analysis (continued)



INCOME

Per capita income in 1974 for Hawaii County was estimated at \$4,587. This ranks the county lowest of the four counties in the State of Hawaii. The median family income for the county in 1970 was \$9,750. Of the 14,692 families in the county, 8,897 of them made from \$5,000 to \$15,000 a year.

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GOVERNMENT

Hilo is the seat of the County Government in Hawaii County. There are no separate municipal governments within the county. The entire county is governed by a mayor and his council. They are elected for four-year terms.

TAXES

Under Hawaii's centralized tax system, non-federal taxes are state-administered and collected. General excise taxes, personal and corporate income taxes, and real property taxes are the major sources of revenue. There are no personal property taxes, inventory taxes, or separate local levies.

UTILITIES

The water for the County of Hawaii is taken from streams, lakes, springs, and other natural sources. Except in rare times of drought, the supply is adequate; however new and better supplies are being sought.

Electricity is the major source of power for Hawaii County, and is supplied by the Hilo Electric Light Company. Because most of the electric power is generated by the burning of imported oil, the rates are among the highest in the nation.

Virtually every community on the island has telephone service. As in the rest of the state, telephone service is supplied by the Hawaiian Telephone Company.

County of Hawaii Analysis (continued)

COLLEGES AND UNIVERSITIES

A four-year university and community college are located at Hilo, and have a combined enrollment of about 1,750 day students. The campus covers 60 acres and intends to add a mauka-adjointing 550 to 600 acres of state-owned land for its expansion.

SCHOOLS AND VOCATIONAL TRAINING

There are thirty separate public schools on the island, with a total enrollment of 17,229 students. The schools range in size from 67 students at Keakealani to 2,285 students at Hilo High School. Including private schools, the number of students on the island from kindergarten through the twelfth grade total 18,300, or 29 percent of the population.

Industrial, technical, and trade schools offer training in fields ranging from truck driving to modeling.

Adult education courses are offered, and further vocational courses are available through the Department of Labor and Industrial Relations.

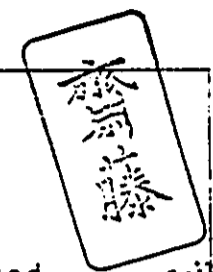
BANKING AND FINANCIAL INSTITUTIONS

Main offices for the Hawaii County branches of the state's seven banks are located in Hilo. The banks have branches widely covering the island.

Savings and loan associations and other financial institutions provide a wide variety of financial services covering almost any need.

RECREATION

The Island of Hawaii has a pleasant climate throughout the year and a variety of scenic areas ranging from snow-capped volcanic peaks to tropical rain forests and sunny beaches.



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County of Hawaii Analysis (continued)

Traditionally, the shorelines have been preferred for fishing, swimming, picnicking, and camping. There are also facilities on the island for specific recreational activities, such as golf courses, small boat harbors, tennis courts, and swimming pools.


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MEDICAL

The Hawaii County Hospital System includes five hospitals widely spread to provide service for the whole island. There is also the St. Francis Hospital located near Hilo.

In 1976, there were 82 licensed medical doctors, 33 dentists, 230 registered nurses, and 14 pharmacists practicing on the island.

RADIO AND TELEVISION

There are six radio stations on the island. Five of these are AM and one is an AM-FM station.

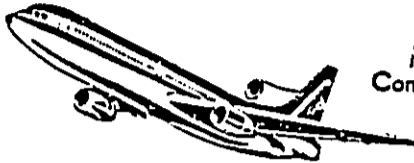
There are three television stations; one is the public television broadcaster, and the other two broadcast local and network programs.

NEWSPAPERS

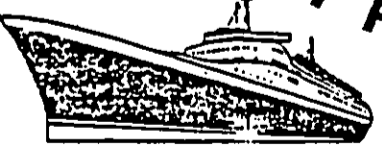
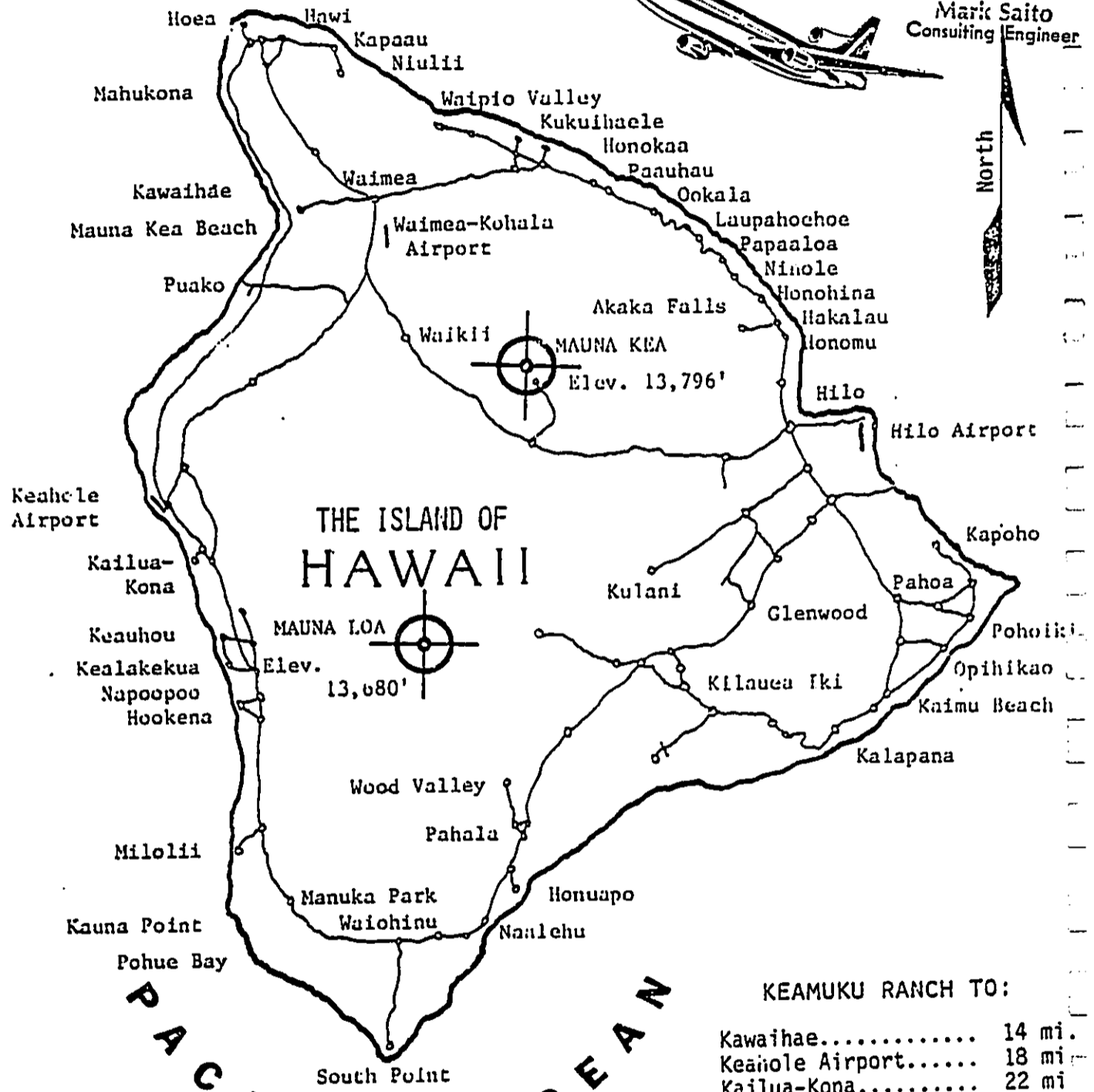
There are several papers in operation on the island, but only one is a daily newspaper, "The Hawaii Tribune-Herald Ltd." The rest are either weekly, bi-weekly, or semi-weekly editions of special interest papers aimed at groups such as churches, or are for advertising.



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Consulting Engineer

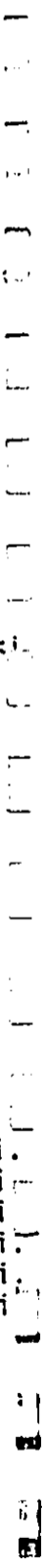


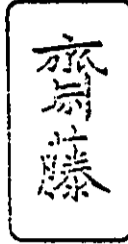
North



KEAMUKU RANCH TO:

Kawaihae.....	14 mi.
Keaiole Airport.....	18 mi.
Kailua-Kona.....	22 mi.
Keohou Resort Area...	26 mi.
Waimea Resort Area...	6 mi.
Hilo.....	65 mi.



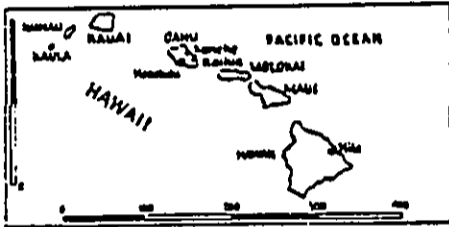


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PERTINENT GEOGRAPHICAL INFORMATION

HAWAII

Capital: Honolulu (325,000). Location: Archipelago of more than 100 islands (eight of substantial size) running roughly northwest to southeast across more than 1,500 miles of the Central Pacific. Topography: Islands of volcanic origin, mountainous and generally steep, with fertile valleys and sand beaches. Climate: Sub-tropical. Warm but tempered by northeast trade winds and only slight seasonal temperature variations (average of high 70s in summer, low 70s in winter). Generally heavy rainfall on windward sides of islands. People: 800,000 (about 80% urban), strongly heterogeneous with substantial numbers of Japanese, Chinese, Polynesians, Filipinos, Portuguese and various mixtures. Language: English, with an accent. Time: Add six hours to New York City time.



Long a territory of the United States, Hawaii became the 50th state in 1959, giving the Union what it had long lacked—a bona fide tropical island paradise. Polynesians are believed to have reached the islands in ocean-going canoes well before 1000 A.D., but they lived on the lush volcanic islands in blessed isolation until Captain James Cook found them in 1778. Pure-blood Polynesians are relatively few in this Pacific crossroads, the place where Asia meets the Occident. Hospitality and a languid life-style lure tourists from all over to our southernmost state, where sugar and pineapple fields prosper in the rich volcanic earth and a few volcanoes continue the island-building process with sporadic outpourings of lava.

TRIPPING IN

AIR: Nonstop and direct flights to Honolulu or Hilo from Chicago by Continental, Northwest Orient and United; from Cleveland by United; from Dallas by Braniff and Pan Am; from Los Angeles by Continental, Northwest Orient, Pan Am, United and Western; from Las Vegas, Phoenix and San Diego by Western; from Minneapolis by Western and Northwest Orient; from Portland by Continental, Pan Am and Northwest Orient; from San Francisco by United, Western, Pan Am and Northwest Orient. Inter-island service by Aloha and Hawaiian Airlines.

SEA: Holland America, Pacific Far East, Prudential and Royal Viking call on Honolulu out of West Coast ports.

HIGHWAY: There are some 3,500 miles of paved roadway, with the most extensive networks on the island of Hawaii and Oahu.

TOURS: Dozens of tour operators offer a wide variety of vacation packages to the islands. Both escorted and independent tours are available, and tour styles include fly/drive and fly/cruise. Tennis, golf, diving, nature study and

villa rentals are among special-interest packages. **BY THE BOOK:** Robert S. Kane, *Hawaii A to Z* (Doubleday); *Fodor's Guide to Hawaii* (McKay); Sunset Editors, *Hawaii* (Lane); Faye Hammel and Sylvan Levey, *Hawaii on \$10 & \$15 a Day* (A. Frommer); Euell Gibbons, *Beachcomber's Handbook* (Van Rees); Bank Wright, *Surfing Hawaii* (Mountain & Sea); Gerret P. Judd, ed., *A Hawaiian Anthology* (Macmillan); Frederick Simpstick, *Anatomy of Hawaii* (Coward McCann); Francine du Plessix Gray, *Hawaii* (Random House).

THE WAY IT IS

TOURIST SEASON: Visitable all year. Summer and holidays draw the biggest crowds.

DRESS: Decidedly casual. Bring bathing suits and light rainwear.

TIPPING: Same as in the continental U.S.

SHOPPING: Bold and colorful fabrics, particularly aloha shirts and muumuus, are bought to be worn in the islands. Beachwear and footwear are popular purchases, as is costume jewelry made of shells, jade and coral. Good woodcrafts and ceramics share counter space with the schlockiest of souvenirs. Hawaiian fruits, candies and jellies and Kona coffee make ideal presents for the folks back home.

BEING THERE

ACCOMMODATIONS: Good to lavish, ranging from motels and motor inns to plush resort hotels. Reserve well in advance, especially for hostleries in the moderate price range and all space in summer. Tent and trailer camping at several grounds (most plentiful on Hawaii, Kauai and Maui) are a popular option to the generally high hotel prices.

FOODS & BEVERAGES: A wide range of cuisine is served at generally moderate prices. In addition to the standard hotel fare, good Japanese restaurants are plentiful, featuring sushi, sashimi and a liberal use of the teriyaki marinade. Chinese restaurants are also popular, though the quality isn't quite up to what you find in San Francisco. Polynesian food—including roast pig and none-too-tasty poi—are central to the traditional Hawaiian feast, the luau, which tourists are prone to sample. French and Italian restaurants tend to be few but round out a welcome variety of fare. Seafood is generally excellent, and fresh fruits—pineapple, papaya and passion fruit—are downright delicious.

DRINKING & NIGHTLIFE: Handsome people with handsome voices and outgoing personalities make good entertainment commonplace in the big hotels, theater reviews and lounges. After-hours hotel-hopping is a fine way to sample the best. Dancing comes with the climate, and most everybody does it. Besides the standard American cocktails, there are some elaborate exotic concoctions using tropical juices for those who like their pleasure sweet.

PERFORMING ARTS: Theater and concerts are pretty much an Oahu thing. Pageants of an historic Hawaiian nature are favored and ongoing. Cinema, yes. Television (Honolulu-based), yes.

FETES & FESTIVALS: Haleiwa Sea Spree (Oahu, Feb.); Wesak Day—Buddha's birthday (Apr.); Lei Day (May 1); Kamehameha Day (June 11); State Fair (Oahu, late June, early July); Hula Festival (Waikiki, Aug.).

SPORTS: There are enough fine golf courses in Hawaii to make you almost forget that there's

an ocean nearby. But not quite. Beaches still draw sand and sun lovers as well as surfers. And ocean fishing—especially off the Kona Coast—brings rewards in marlin, tuna, dolphin and other gamesters. Tennis and the hunting of boar and chucker on the island of Hawaii are also offered.

PLACES

OAHU: About 80 percent of all Hawaiians live on this island—home to Honolulu, Waikiki and similar tip-of-the-tongue tourist meccas. Be sure to tour Pearl Harbor and view the moving memorial atop the sunken battleship *Arizona*, pay your respects to the war dead at the Punchbowl cemetery, pay a visit to the tri-stated Bishop Museum, and spend a day at the Polynesian Cultural Center at the east-coast town of Laie, where the Mormon Church staffs and operates a remarkable and authentic collection of populated villages representing practically all the South Pacific cultures. As for the famed landmark, Diamond Head, it's hard to miss—wherever you are, wherever you be going.

HAWAII: The "Big Island" is bigger than the rest of the major islands put together. Its cynosure is towering Mauna Loa (13,680 feet), the largest still-active volcano in the world and the dominant peak in spectacular Hawaii Volcanoes National Park. (Neighbor cater Kilanea, however, is the fiery crowd pleaser that lights nocturnal skies with its pyrotechnics.) On the west side of Hawaii is the steep and rocky Kona Coast, coffee-rich but largely beachless. Along it the accomplished Captain Cook came to his untimely end, and here the ancient Hawaiians built their City of Refuge (now a national historic park), where disgraced warriors, breakers of taboos and war refugees found sanctuary and absolution. Back on the wet east side of the island is Hilo, the state's second largest city, backdropped by majestic Mauna Kea (13,784 feet) and a charming jumping-off place for exploring the island. The Kamuela area in the north is headquarters for the 300,000-acre Parker Ranch, which has museums worth visiting.

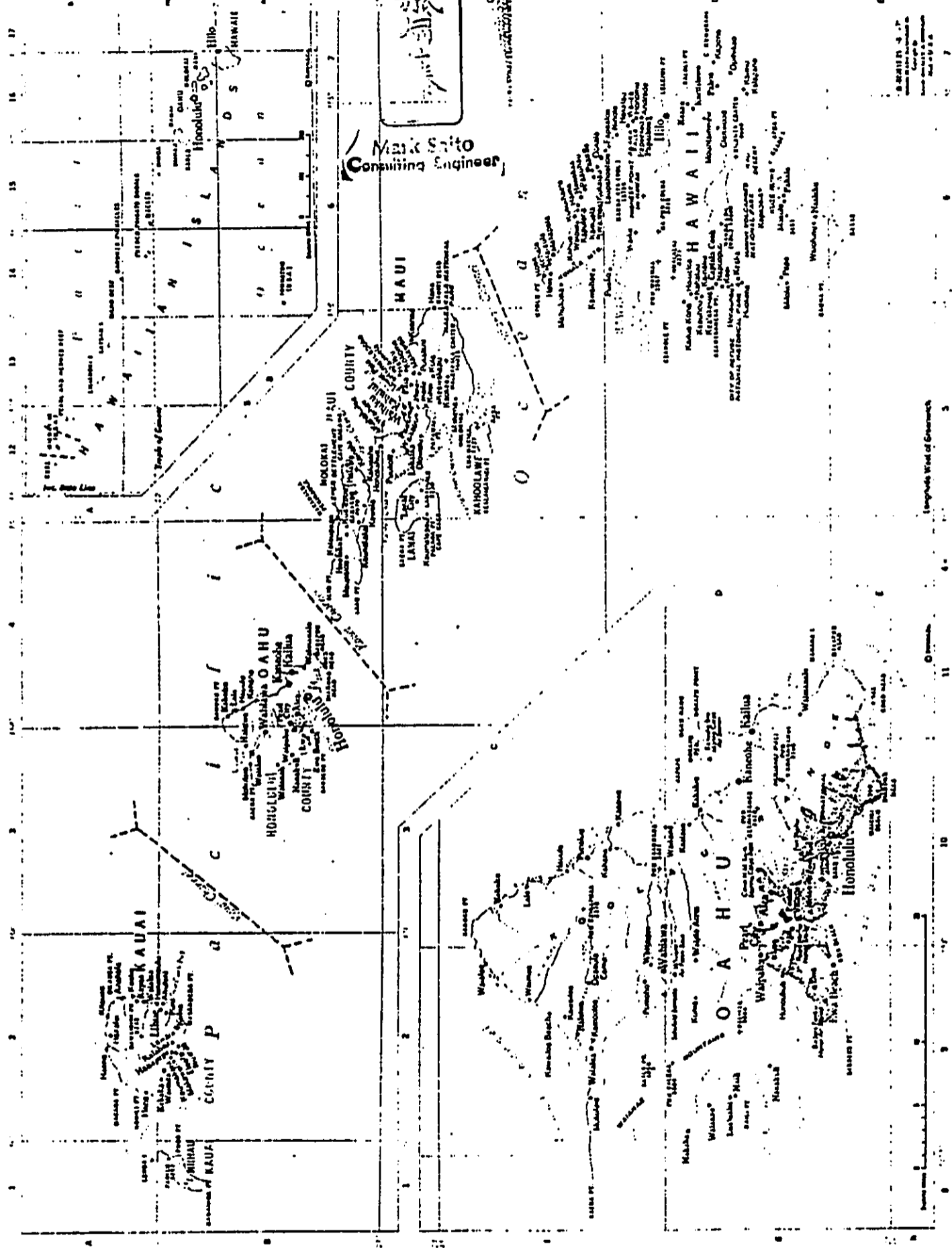
KAUAI: The "Garden Island" it's called, and lush fields of sugar, pineapple and taro validate the claim in what many consider the most "perfect" of Hawaii's islands. Tourists come to see spectacular Waimea Canyon, touristy but satisfying Fern Grotto, exquisite Hanalei Bay and the barely accessible cliffs of the Na Pali Coast.

MAUI: Many an island freak will tell you *this* is the place to end your days, on the second largest in the group. The sun is believed to reside in Haleakala crater, focus of Haleakala National Park, the extinct volcano which "created" the eastern half of this bifurcated island connected by a fertile isthmus. But the smaller west section is prized by those who know a good thing when they see it—particularly the picturesque old town of Lahaina, where randy whalers and no-nonsense missionaries met more than a century ago in a battle for local hearts and minds. Judging by what you find today, the tourists won. The nearby beaches of Napali and Kaanapali are considered treasures by many.

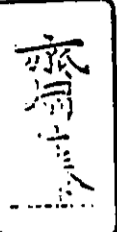
FOR INFORMATION

HAWAII VISITORS BUREAU: 2285 Kalia Ave., Honolulu, HI 96875.

Hawaii



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Consulting Engineer



Scale: 1:50,000
 Date: 1950
 Project: Hawaii



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GEOGRAPHIC LOCATION AND PERTINENT FACTS
ABOUT THE
STATE OF HAWAII

THE STATE

Hawaii is nicknamed "The Aloha State," and its motto is "The Life of the Land is Perpetuated by Righteousness." Native Hawaiians belong to the Polynesian race and are an intelligent people with good appearance and fine physique. They discovered and settled the island about a thousand years ago or more, probably coming from the Society Islands. The Hawaiians lived in villages usually nearby the sea. In addition to having fish and other seafood, their diet consisted of taro grown in artificial swamps, yams and sweet potatoes grown on drier land, breadfruit and bananas, both of which required cooking, and many other food products including certain seaweeds, coconut, Kukui, and pandanus. Pigs were raised and then roasted in pit ovens for community feasts. The big roots of the taro were ground and slightly fermented into a food called poi, which was a main food staple; other foods merely supplemented it. Clothing was made from the inner bark of trees. Chiefs had ceremonial robes made from feathers of gold, green, and many other colors. Utensils were made of wood, stone, bone, and plant fibers.

Situated in the tropics, just south of the Tropic of Cancer, Hawaii's temperature at sea level average 72°F. and there are only five to eight degrees difference in the mean temperature of the warmest and coldest months. The daily range of

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

temperature is about 10°F. Maximum temperatures rarely approach 90°F and frost is unknown except in the highest mountains and then never occurs below 4000 feet in elevation.

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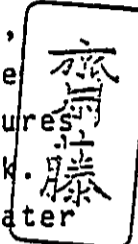
Rainfall is largely determined by the mountains and exposure to the trade winds from the ocean. At ranges of 2,000 to 3,000 feet on the northeast side of high mountains, the mean average rainfall is between 100 and 300 inches. In contrast, near sea level on leeward Kauai, rainfall is only 20 inches per year. Occasionally, warm damp winds from the south called Kona storms, bring heavy rains to the ordinarily dry sides of the islands. These such rains have been known to bring 24 to 30 inches of rainfall to the islands in 24 hours. Hawaii normally, though, has a high percentage of sunshine, especially on the leeward side of the mountains.

A large variety of plants flourish in Hawaii. More than 900 native species of plants are known of which about 300 are trees. The forests of Hawaii are of great value for the conservation of water, needed for irrigation purposes, domestic supply, and the prevention of floods and soil erosion. About 700,000 acres of forest are owned by the state and 357,000 acres of privately owned land are also included in forest reserves. Together, these acres total more than one quarter of the area of the islands.

Except for birds, animal life, originally, was scarce, including no more than a species of bat and the geckos or little lizards. In modern times, wild pigs and goats, and in some places wild cattle and spotted deer occur. Native birds were abundant and included 60 species of songbirds, many migrant fowl, and a number of exotic birds. There are no snakes, and until introduced, ants, mosquitoes, spiders, and most other insect pests, were unknown. To help control such insect pests, toads were introduced. There are hundreds of species of brilliant colored fish in the shore waters.

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

The bulk of the island's mineral production is in stone. Hawaii, Kauai, and Oahu produce limestone and Maui, Kauai, Oahu, and Hawaii supply basalt. Both coral and lava stone have been quarried for building churches and other structures or for crushing into materials for roads and concrete work. In the past salt was made by solar evaporation from the water of a salt water lake in Oahu.



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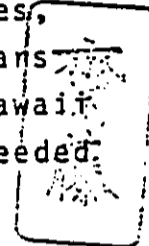
The Hawaiians readily accepted education, and only 12 years after the arrival of missionaries in 1820, there were some 900 schools for teaching 53,000 island children and adults. By 1832, 80 percent of the Hawaiians were literate. By 1831 and 1834, two institutes were founded for the education of teachers and religious assistants. By the 1840's, education had progressed to the point where students from California and various Pacific islands came to an English taught school in Honolulu. The present school system offers work from Kindergarten through high school and university, with special schools for the training of the physically handicapped, the feeble-minded, and juvenile delinquents.

The first missionaries arrived in 1820 and conversion of the Hawaiians to Christianity was quickly achieved. In Honolulu, there are Roman Catholic and Episcopal cathedrals and a Buddhist temple. A Mormon temple is located in Oahu.

The sugar industry is the most important industry in Hawaii. The soil is fertile, most of the sugar cane is irrigated and heavily fertilized, and because of skilled management, the output of sugar per acre is the highest in the world. The annual value of the crop is about \$148 million. One mill makes white sugar; the rest is shipped as raw sugar to the San Francisco Bay area, where it is refined. The pineapple industry is second in importance to sugar. Pineapples are raised by the plantation method on Oahu, Maui, Lanai, and a

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

few on Molokai. Coffee of a superior quality is grown in the Kona District on Hawaii Island. It ranks third in value among the crops, but is far behind sugar and pineapples. Other farm products include bananas, Macadamia nuts, papayas, potatoes, and other vegetables. Orchids worth several million dollars are sent by air to the mainland each year. Visitors to Hawaii are a major source of revenue. The tourist income is exceeded only by that of the sugar and pineapple industries.



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THE ISLAND OF HAWAII

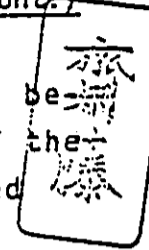
The Island of Hawaii has three different nicknames. Because of the three active volcanoes and the many other volcanoes which are inactive, the Island has been called the "Volcano Island." The three active ones are the Mauna Loa, which is the world's largest active volcano (13,675 ft.), the Kilauea (4,088 ft.), and the Hualalai (8,275 ft.) Since the beginning of the 19th century, Mauna Loa has erupted on an average of once every three and one-half years and has produced a lava flow on an average of every six years. The eruptions are usually relatively quiet and non-explosive and few lives have ever been lost, but the lava flow has been known to block highways, invade sugar plantations and ranch lands, and reach the seacoast. The eruptions are spectacular and attract many visitors, some of whom fly over the craters and flows.

Besides the volcanoes, the island of Hawaii has long been known for its beautiful flowers. One in particular is the orchid, from which comes the second nickname of the island - the "Orchid Island." Hawaii's tropical climate is well suited for the growth of these flowers and many others, too, and they take advantage of this fact by growing them in mass quantities and selling them to eager tourists.

Last, but not least, is the most popular nickname of the island, which is the "Big Island." This nickname is ideally

Geographic Location and Pertinent Facts About the State of Hawaii (cont.)

suited to distinguish Hawaii from the rest of the islands because the "Big Island" is almost twice the size of any of the other islands. Hawaii is also the only part of the United States which is growing in size because of its volcanic activity.



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Consulting Engineer

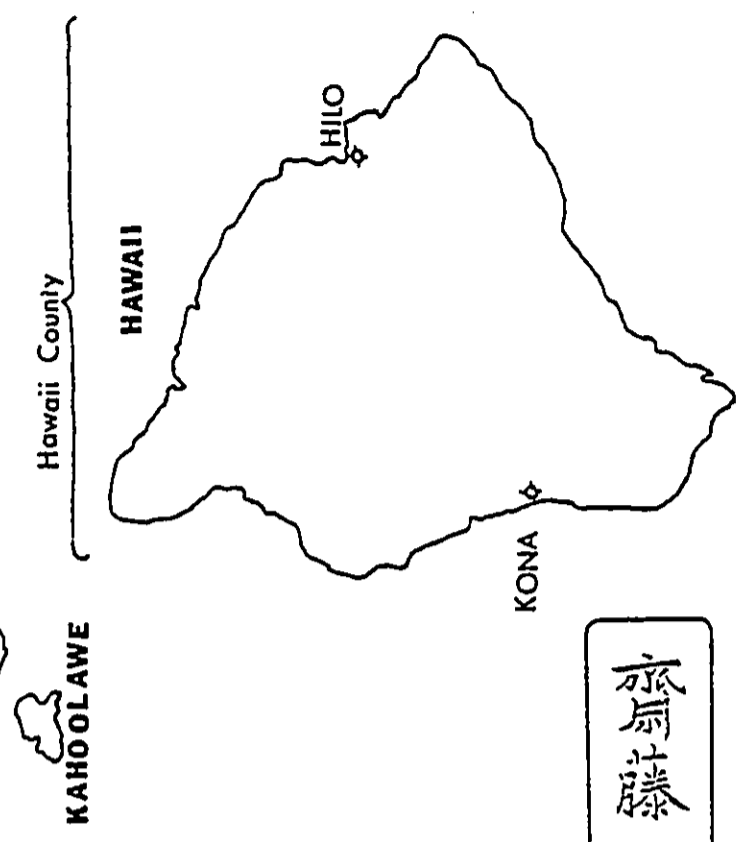
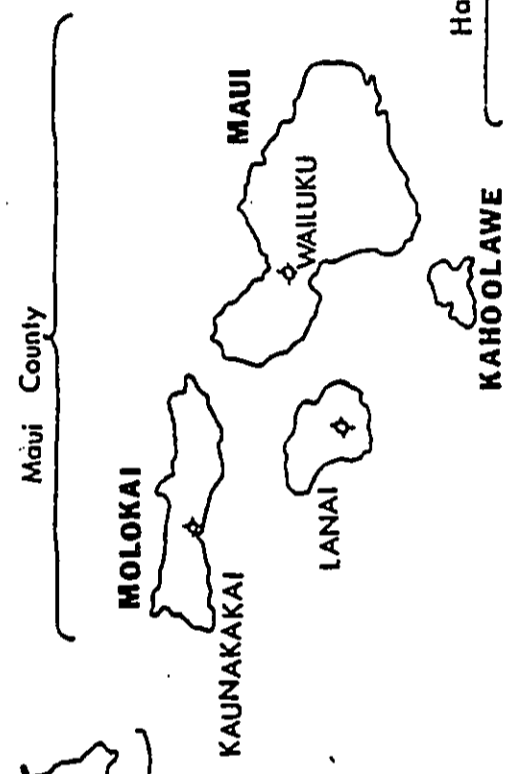
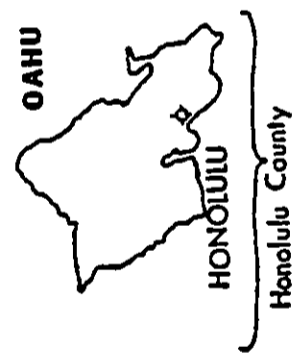
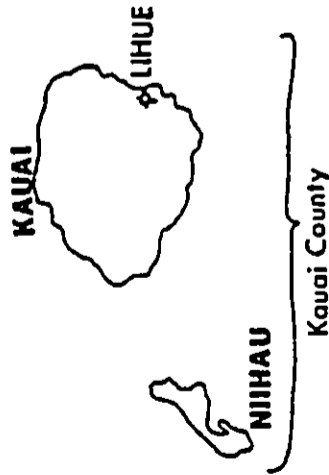
The "Big Island" is the "Texas of Hawaii" in comparison of size to its neighboring islands and also because one of the largest ranches in the United States under single ownership, the Parker Ranch, is located on it. Several other features distinguish the island. The island of Hawaii has the United States' only coffee industry, and it is the state's largest producer of sugar, papayas, macadamia nuts, anthuriums, and Christmas trees. It is also the southernmost part of the United States, very rich in history, and most important to tourists, it offers a variety of scenery ranging from vastly desolate volcanic areas to tropical valleys with spectacular cliffs and waterfalls.

Earthquakes in Hawaii are fairly common, but rarely damaging. However, earthquake waves from distant sources have sometimes destroyed lives and property on the coasts. One such earthquake in 1976 came from near the Aleutian Islands. It was worse at Hilo, the county seat and largest city in Hawaii, where much of the waterfront was destroyed with losses of property worth many millions of dollars. The known dead totaled fifty persons. When earthquakes occur in the Aleutian area, warnings are issued by the government and residents in the area are requested to evacuate.

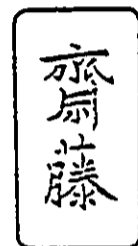
On the southwest slopes of Hawaii at elevations up to a few thousand feet is the Kona District in which a superior grade of coffee is grown. Most of the coffee beans are hand-picked while they are still green and shipped from Hawaii to be processed and packed. Most of the northwestern portion of the

Geographic Location and Pertinent Facts About the State
of Hawaii (cont.)

state consists of grasslands which are primarily used for cattle grazing. The Parker Ranch covers a large section of this area. Sugar cane is grown on the rainy windward coast, without irrigation, at elevations up to several thousand feet. Part of this region is covered by dense rain forests, and is noted for its numerous varieties of orchids. Deep-sea fishing is carried on off the coast of the island. A paved highway encircles the island, mostly within sight of the three hundred mile coast line.



State of HAWAII



Mark Saito
Consulting Engineer



Mark Saito
Consulting Engineer

PRELIMINARY GEOLOGY REPORT

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Consulting Engineer

GEOLOGY

The island of Hawaii today consists of five volcanic mountains. All of them are very young, and three of the volcanoes have been active in historic time. A minimum of two other volcanoes have been buried by more recent volcanoes. Kohala Mountain, which forms the northern end of the island north of Kamuela, is the oldest. K-Ar dating has established their age at 700,000 years (Madonald, 1970).

The Kohahala Volcano had already reached nearly its final size before southern flank was buried beneath lava flows from Mauna Kea, the next volcano to the south.

The entire surface area of the subject property is made up of the Mauna Kea volcanic series. At a depth, it is probable that Mauna Kea lavas overlap Kahala lavas, and therefore must be younger. The oldest Mauna Kea lavas are exposed above sea level at Laupahoehoe on the Hamadua (NE) coast. All of the visible portion of Mauna Kea must be more recent than middle Pleistocene.

Nevertheless, Mauna Kea had already reached its present size by the time the last Pleistocene glacier disappeared 15,000 years ago. Only three flows are known that are later than the glacial moraines. Mauna Kea has probably not been active in the last 3,000 years. Occasional earthquakes originate beneath it and emphasize the possibility that it may someday erupt again.

Hualului, on the west side and south of the subject property, is a dormant volcano that last erupted in the years 1800 to 1801. These eruptions flowed west and into the sea, destroying at least one village. Several thousand earthquakes were reported beneath its northern flank in 1929, indicating that its magmatic hearth is still alive (Madonald, 1970). It is the opinion of this author that no apparent danger exists from this volcano.

There appears to be three distinct phases to the Mauna Loa Volcano, an ancient volcano found near Ninohe, at about the same time as the Kahala eruptions. After Ninohe became extinct, activity appears to have shifted to two other centers; one beneath the present Mauna Loa summit, and the other 18 miles or so east, both forming large shields.

Activity at Kulani to the east came to an explosive end not more than a few thousands of years ago. The more westerly shield has continued active and has built the present summit of Mauna Loa. The entire 10,000 cubic miles of the mountain was built in little more than 1 million years.



An 1859 flank eruption from Mauna Loa flowed northwest to the sea through the saddle between Aaulalo'i and Mauna Lea. The flow was 5 miles (8 Km) to the south of the property at its closest. Mark Saito
Consulting Engineer

A 1843 flow from the summit flowed north to the saddle road then westerly down between the subject property and Hualala. The westerly extension of this flow never reached the southern line of the property, but it appears that it would have flowed south of the property line.

Recent history has shown that most eruptions flow toward Hilo from the east zone. It would take a well placed eruption to effect the subject property in the near term; one which is not very likely in the time frame of real estate contracts.

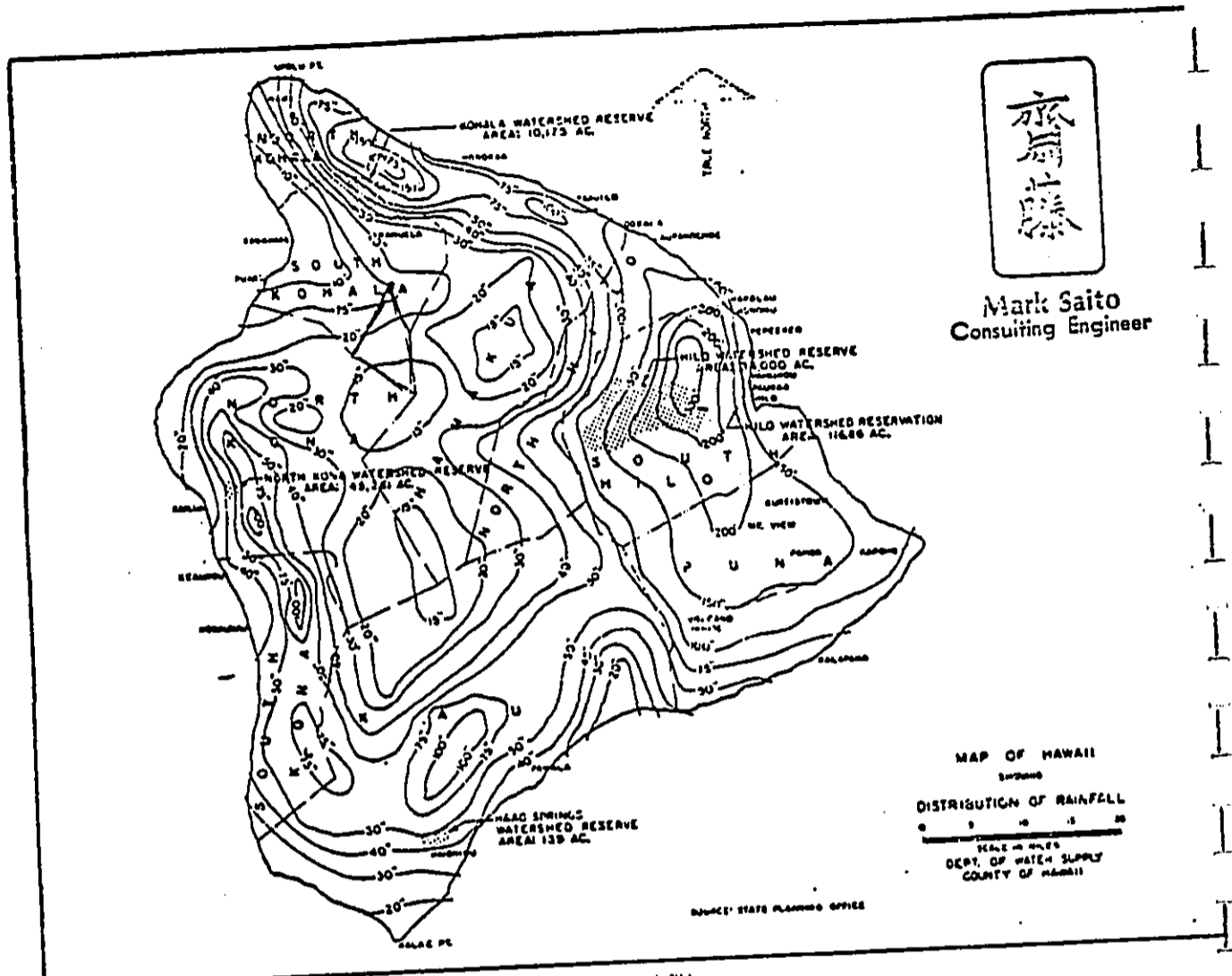
The northern half of the property has a bedrock geology of the Haunakua Volcanic series. This series consists of theolite basalts. The southern half of the property, roughly to the south of the Signal Hawaii property, consists of the lower member of the younger Lanpahoehoe series of basalts. The two series contact at Poopoo Gulch. Another 2 defined gulchs Arwalakeakua and Waikii, help form the drainage in the area, which is draining to the west.

7 cinder and spater cones are located within the boundaries of the property. These present no eminent danger in that no activity has been reported connected to the Mauna Kea volcanic series in history.

Pahola ash covers the upper Hamakua volcanic series to the north; up to 25 feet in one area. The ash consists of vitrified ash, bits of Pele's hair; Pele's tears and Pumice. Throughout most of its extent, the once glossy ash has been largely altered by weathering to a mixture of clay minerals and hydrated oxides of aluminum and iron. This ash is older than the Lanpahoshoe volcanic series and probably originated at Lanpahoehoe cones on Mauna Kea and late Hamakua cones.

The south boundary of the property and the county line are probably determined by Mauna Loa lavas of the prehistory Kau volcanic series, which is the youngest series.

7/31/75



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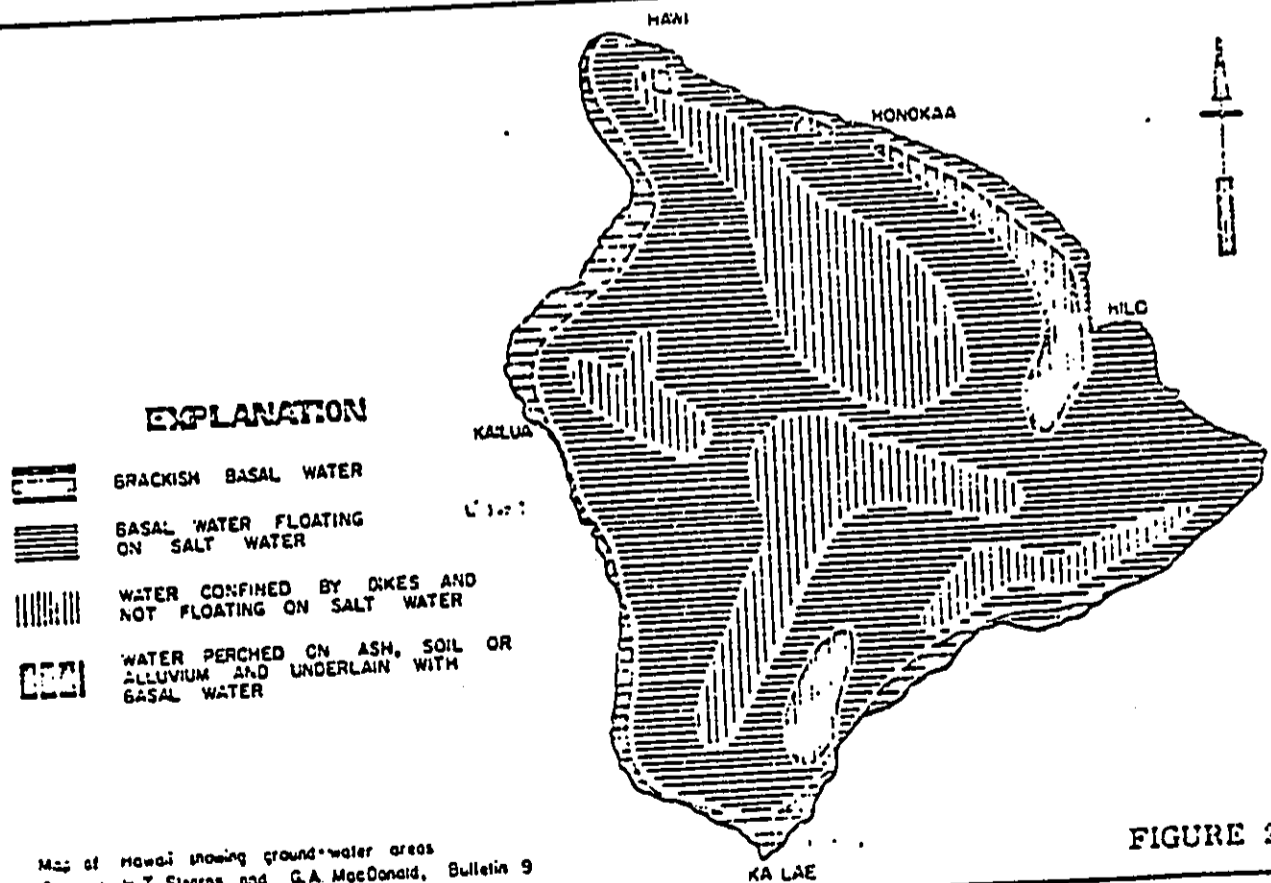


FIGURE 2



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WATER

In dry areas, evaporation and transpiration may greatly exceed surface runoff and infiltration. In young lavas, essentially all of the rain water that is not evaporated or transpired infiltrates into the ground. In all but dry areas; 1/3 the rain goes into stream runoff, 1/3 evaporation plus transpiration, 1/3 to evaporation. Enclosed in the material is a rainfall chart. As one can see, the further down the mountain you proceed, the less precipitation you encounter.

The ground water in the region is dependent upon the Hydenberg Lense. This is a lense of fresh water that floats on the sea water under the island. Most all of the rainfall that is absorbed by the ground percolates down to this lense and then migrates toward the sea within the lense. The lense itself is thickest near the topographic highs of the island and then outward to the open ocean. There is some mixing of fresh and salt waters near the coast because of the draw down on wells in the area.

Data from existing wells in the area indicate that the lense is about 300 feet thick, and has quite a bit of recharge capability. The state drilled a well at the 2,200 foot level (marked on map) and draws 1.4 million gallons per day. The cost of this 18 inch well was \$330,000. This includes testing, logging and exceptionally good casing.

The nearest I could determine, it should cost approximately \$80 per foot to sink a well. The water table should be reached about 250 feet above sea level.

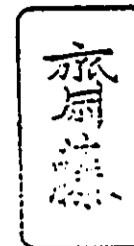
Presently, a water system services the property. This is part of the Parker Ranch water system, and the ranch owns about 50 miles of pipe and 19 holding tanks. These service the entire acreage. The water rights to service 8,000 cattle are guaranteed by contract (author's opinion) but subject to adjustment at some later date.

This water comes from runoff in the Kahala mountains to the north of Waimea.

SOILS AND TOPOGRAPHY

Accompanying this report is a soils report for the entire island. Top soil exists on the great majority of land.

There are 7 cinder cones on this property and each contains large quantities of cinder. This is the chief road building agent on the island and is known as black gold. There are strict usage policies that are extended on the use of the cones as construction materials. Boise Cascade had to replant one cone and cease and desist exploitation of another, even though they were on their property.



Mark Saito
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Soils and Topography, Cont.

Fortunately, (as per map) there are permits to use 2 of the cones as building material. Presently a local aggregate company uses one of the cones under lease to Isaacs. In this one cone is enough material to construct all the roads this property will ever need.

The roads in the area do not have to be dedicated to the county so some of the roads will be able to utilize in-place materials and not comply with the high county standards. Road costs and existing roads are estimated in John Michael White's summary of the property.

The topography of the subject lands is such that less than 5% is lost to terrain. Road building should be relatively easy. There are existing roads on the subject property including some paved roads (see air photos that Nelson has).

Some coulees exist on the property which should be bridged in order to preserve roads. This could be easily done with culverts. Once again, this is a minimal problem localized in the topographic low south western part of the property.

This same area has many hummocks with some exposed basalt. The extent of this hummocky area can be best determined by scrutinizing air photos. The property in general, slopes to the west and afford a beautiful view of the Kona Coast line to almost all portions of the property.

All in all, I was very impressed with this property. The upland 1/3 of the property had soil and rainfall enough to grow heavy grass for cattle. I would suspect that a variety of vegetables would be able to survive with only minimal irrigation. Forestation is just a matter of planting the trees, as the Parkers did in certain areas in past decades. Soils, view, and vegetation make this area the most desirable western slope property on the island.

Drainage for holding tanks is unusually good because of the very porous basalts.

DEVELOPMENT ATTITUDE

Included in the materials are current copies of the zoning code, subdivision regulations, and the general management plan for the island of Hawaii.

Planning and zoning are pretty self-explanatory. The property is zoned agriculture with 40 acre tracts minimum. Any subdivision would have to be approved by the county government. Any zoning change would have to be done by the state Land Use Commission, and would be very difficult. Boise Cascade found this out the hard way.

Development Attitude, Cont.

The State Land Use Commission has four zoning classifications: Agricultural, conservation, urban and rural. Most all the islands are in the first two classifications. This Commission is appointed by the governor and is one of the most powerful political forces in the islands.

The county of Hawaii is the only local governing body on the Big Island as there are no incorporated cities. The General Plan for the island portrays their commitment to comprehensive planning. Presently, the county plan is being revised. The proposed changes are included in the packet accompanying the plan.

There is also a more comprehensive plan being put together by the county for the South Kohala district. This plan should be out for public hearings in the next few months. It is the opinion of this author that these plans are fairly well adhered to by the planning commission in their review of development plans.

Generally speaking, the Big Island is the most democratic and honest of the county governments in Hawaii. They are trying to do the best job they can to preserve the unique Hawaiian environment while still developing the industries (of which tourism is number one) to economically survive. The Planning Commission did force the issue with Boise Cascade because Boise tried to force a radical change of zoning and planning on the Commission.

One complaint was that Boise shipped in their own crew and equipment from Idaho and did all the developing right in the Kahala area where the unemployment rate is 20%. This is in sharp contrast to this project will give priority to local residents in construction jobs.



II. ECONOMIC BACKGROUND

A. State of Hawaii

Hawaii, the only State not situated on the North American mainland, comprises seven major and 124 minor volcanic and coral Islands which form a 1,610 mile long chain in the middle of the Pacific Ocean. The major Islands are, in order of size: Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, and Niihau. Admitted as the 50th State in 1959, the Aloha State, with a total land area of 6,426 square miles, ranks 47th in size and has a coastline of 750 miles. Honolulu, Hawaii's capital and largest city, is situated about 2,400 miles west of the U.S. mainland, on the Island of Oahu.

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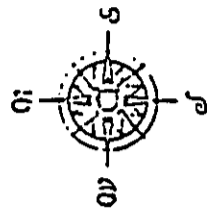
1. Population

The State has enjoyed rapid growth during the past quarter century. This growth is related to the growth pattern of the entire western portion of the United States, and may be traced back to World War II, which was followed by an era of economic expansion. This growth was further stimulated in 1959 with the advent of Statehood, and has continued unabated in the following years. As shown in Table 1, the resident population of the State increased from 499,794 persons in 1950 to 886,600 on July 1, 1976, as estimated by the Hawaii State Department of Planning and Economic Development. The last figure represents approximately 830,000 civilians and 56,000 military. Since the 1970 Census, the State's total resident population has grown 15.2 percent, triple the rate experienced nationally.

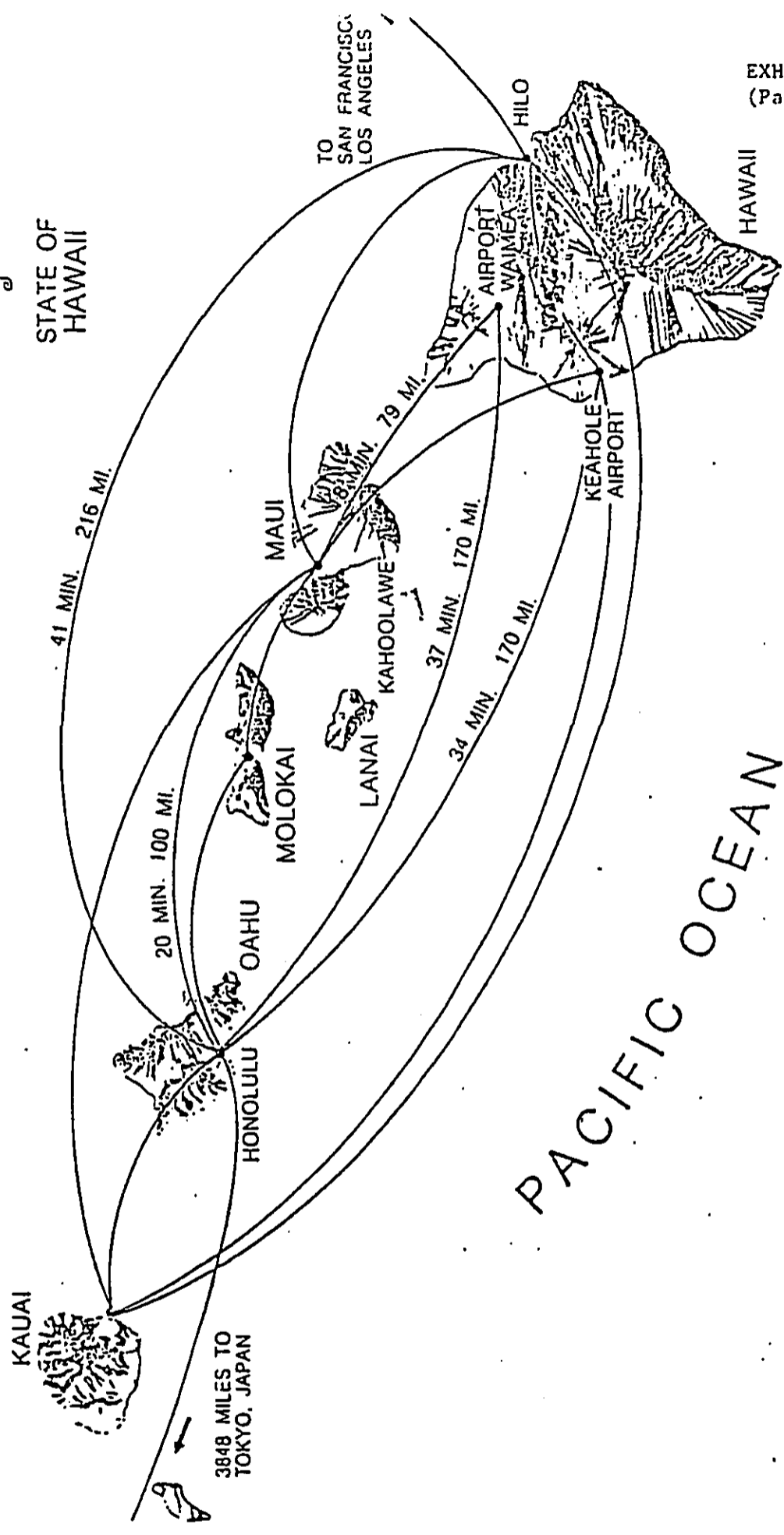
Over 81 percent of the 1976 population lived on Oahu, giving this Island a density in excess of 1,100 persons per square mile, 8.6 percent lived on the Island of Hawaii, 3.8 percent lived on the Island of Kauai, and 6.5 percent lived on the Islands of Maui, Molokai, and Lanai. The population is young with over 50 percent under 25 years of age, and is racially diversified with over one-fourth the product of mixed marriages.

2. Income and Employment

Personal income, as shown in Table 2, is increasing at a much more rapid rate than either population or employment in Hawaii. In the third quarter of 1976, total personal income reached an estimated \$6.2 billion, an increase of 8.2 percent over the same period in 1975. During the ten year period 1966 to 1976, personal income had an annual compound growth rate of 10.8 percent. Per capita income in 1975 was an estimated \$6,658, over twice the 1965 level.



STATE OF
HAWAII



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Table 1

STATE OF HAWAII
POPULATION, EMPLOYMENT, AND ASSESSED VALUATION
1940 to 1976

Subject	1950	1960	1970	1974	1975	1976
Resident Population(1)	499,794	632,772	769,913	854,100(2)	868,400(2)	886,600(2)
City & County of Honolulu	353,020	500,409	630,528	697,400	705,700(2)	718,400(2)
Other Counties	146,774	132,363	139,385	156,600	162,700(2)	168,200(2)
Civilian Employment(3)	170,075	228,050	297,110	331,930	330,760	331,300(5)
Agriculture	27,235	19,190	13,166	9,310	10,020	N.A.
Federal Government	18,891	27,010	31,391	31,010	30,530	N.A.
Other	123,949	181,850	252,553	291,610	290,210	N.A.
Assessed Valuation(4)						
Gross	772.8	3,174.1	7,666.5	12,642.4	15,254.4	N.A.
Net Taxable	333.6	1,820.1	4,627.0	8,316.4	10,415.9	N.A.


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N.A. Not Available

1 As of April, includes armed forces and military dependents.

2 As of July 1.

3 Annual averages. Data for 1970 and after on revised basis.

4 In millions of dollars. As of January. Fiscal years beginning July 1 as of 1969.

5 As of March 1976.

Source: Hawaii State Department of Planning and Economic Development, 1976 Data Book, Statistical Report 119.

Hawaii State Department of Labor and Industrial Relations, Labor Force Estimates.

Table 2

STATE OF HAWAII
POPULATION, MILITARY DEPENDENTS, ARMED FORCES, CIVILIAN LABOR FORCE, PERSONAL
INCOME AND STATE TAX REVENUES: 1960 to 1976

Year	Resident Civilian Population(1) July 1	Military Dependents	Armed Forces	Total Labor Force	Unemploy- ment Rate	Personal Income, Total (\$1,000,000)	Personal Income Per Capita \$	State Revenue (\$1,000,000)
1960	522,100	60,300	59,200	235,140	3.0	1,478	2,368	148,2
1961	535,800	62,000	60,800	242,850	4.1	1,595	2,481	164,8
1962	541,300	63,200	79,000	246,180	4.7	1,677	2,568	172,7
1963	561,200	61,500	59,600	250,880	4.8	1,769	2,637	175,2
1964	557,600	69,100	73,200	257,630	3.9	1,906	2,811	191,2
1965	584,600	65,800	53,400	269,020	3.4	2,028	2,906	212,7
1966	593,600	62,600	54,100	281,880	3.2	2,225	3,192	263,2
1967	605,200	61,300	56,000	293,400	3.5	2,440	3,447	297,4
1968	618,300	59,100	57,000	306,780	2.9	2,729	3,796	324,3
1969	642,100	59,700	48,500	326,700	2.7	3,087	4,155	379,8
1970	663,400	57,800	53,000	311,150(2)	4.5(2)	3,523	4,623	438,3
1971	685,700	62,200	50,800	325,320	6.3	3,773	4,818	480,6
1972	702,700	66,200	52,000	338,670	7.3	4,124	5,123	512,0
1973	715,300	70,300	58,100	351,670	6.8	4,617	5,570	571,6
1974	728,200	68,300	57,500	359,070	7.6	5,069	6,010	650,8
1975	745,900	63,700	58,800	356,440	7.2	5,674	6,658	743,9
1976	763,700	67,000	56,000	363,900(3)	9.0	6,178	N.A.	N.A.

N.A. Not Available

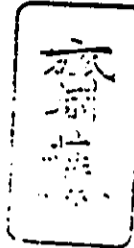
1 Excludes military dependents.

2 Department of Labor and Industrial Relations, not on the same basis as previous years.

3 As of March 1976.

Source: Hawaii State Department of Planning and Economic Development, 1976 Data Book
Bank of Hawaii, First Hawaiian Bank.EXHIBIT I
(Page 4)Mark Saito
Consulting Engineer

The number of civilian jobs in Hawaii has increased dramatically since Statehood. It rose from 228,050 in 1960 to 331,590 in 1970. The annual average in 1976 was 378,900. Hawaii's location in the Pacific accords it a major role in U.S. military planning. The United States Army, Navy, and Air Force units in the Pacific area are all under a single command located in Hawaii. Until 1976, government was the largest single employer in the State. Federal government jobs alone accounted for 7.9 percent of the 1976 civilian jobs; and when combined with State and local employees, government represented 22.4 percent, or about one out of four. Until 1972, Federal defense expenditures were the largest source of income in Hawaii.



The largest occupational group in Hawaii was wholesale and retail trades which filled 85,900 jobs in 1976. Extractive industries are few and manufacturing, except for sugar and pineapple processing, is not yet a major economic sector.

In response to increased mechanization, development of agriculture lands to more profitable uses and the growing volume of tourism, there has been a marked shift in economic activity in recent years from agriculture to the visitor industry, as shown in Table 3 following. Where sugar and pineapple production had been Hawaii's major historic sources of income following armed forces expenditures, visitor expenditures since 1967 have generated greater income than both major agricultural activities combined.

3. Construction

Construction activity in the State was vigorous starting in about 1968 when a large number of building permit applications were submitted on Oahu in anticipation of enacting the Comprehensive Zoning Code. Resulting building activity contributed to a then record pace set during 1970. After a minor contraction following 1970, activity picked up again, and in 1975, construction put in place amounted to another record high of \$1.14 billion. The following year, however, saw construction put into place decline 11.4 percent to \$1.101 billion.

The construction industry has been a major component of the State's economic activity, and except during the past few years, construction completed consistently exceeded visitor expenditures. Further, since 1965, construction employment has been larger than the State's agricultural employment, historically a major activity in the State's economy.

Table 3 MAJOR SOURCES OF STATE INCOME
(By Industry)
(In Thousands of Dollars)

Year	Federal Defense Expenditures	Sugar Production	Pineapple (Canned and Juice)	Visitor Expenditures
1950	\$ 147,039	\$124,000	\$ 97,400	\$ 24,200
1955	272,478	145,000	110,100	55,000
1956	284,514	148,000	116,800	65,000
1957	307,940	146,000	110,200	77,600
1958	301,700	98,000(1)	130,100	83,000
1959	316,000	122,900	128,300	109,000
1960	351,400	118,400	119,400	131,000
1961	379,900	136,500	117,500	137,000
1962	348,000	149,300	115,000	154,000
1963	347,500	181,700	123,700	186,000
1964	392,600	154,600	126,900	205,000
1965	430,200	165,700	126,600	225,000
1966	488,400	179,600	127,700	280,000
1967	561,400	180,300	133,300	380,000
1968	574,600	189,100	127,500	440,000
1969	625,900	179,000	125,400	550,000
1970	639,400	187,800	138,600	595,000
1971	708,800	202,900	141,400	705,000
1972	744,200	184,700	145,400	840,000
1973	840,900	222,200	142,400	1,020,000
1974	897,900	676,600	127,100	1,225,000
1975	982,800	365,800	136,700	1,270,000
1976	1,034,000	N.A.	N.A.	1,450,000



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19.15%
21.43%
20.10%
3.67%
14.17%

N.A. Not Available
1 Four month strike.

Source: Bank of Hawaii, Annual and Monthly Economic Reviews.
Hawaii Visitors Bureau, Annual Research Reports.
Department of Planning and Economic Development, 1976 Data Book,
Table 166. First Hawaiian Bank, Economic Indicators

4. Land Use

Not all land in Hawaii is usable. Since the Islands are volcanic in origin, much of the total land area is too steep for development, or lacks production capacity. Out of the four million acres on six major Islands, only 155,705 are in urban use. The major uses are grazing (1.2 million acres), forest reserve (1.2 million acres) and pali (cliffs), or other barren land (0.5 million acres).



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Over 50 percent of the total acreage of usable land on Oahu is unused open space, or forest reserve when last surveyed in 1974. The second largest land use category is agriculture with 76,124 acres followed by residential with 26,481 acres (excluding military use).

5. Economic Outlook

The short range outlook for the State continue to be clouded by recent world political and economic events. Both the extent and implications of the energy crisis are difficult to determine at this time. The State's dependence upon the United States defense posture, the mainland economy, and the Japanese economy make current internal analysis insufficient, and external analysis conjectural.

A few patterns are, nevertheless, beginning to emerge regarding the direction of the economy. Despite a slowdown in tourism growth in 1974 and 1975, tourism was up sharply in 1976, and continues strong in 1977.

Growth in tourism will be augmented by expected gains in federal government expenditures (both defense and non-defense). World sugar prices fluctuated widely from 1974 to 1976. Much of the fluctuation occurred after the stabilizing U.S. Sugar Act expired. Some stability may return as a result of the recently proposed \$0.01 per pound sugar subsidy, announced by the Administration. Fruit crop failures in other countries and on the U.S. mainland have also bolstered sagging pineapple activity, mitigating its decline over recent years.

Longer range, the economic forces serving to stimulate both the U.S. mainland and Japan in the past are expected to continue, but a slower pace. Since the State's economy is keyed to activity in these two areas, continued, but more moderate, growth is also expected. Further, sufficient economies of scale are being achieved to support secondary manufacturing and tertiary service industries. As these industries expand, some could begin serving export markets, and provide more economic stability via diversification.

For example, processing (exclusive of sugar and pineapple) is advancing steadily. Important new industries include cement making, oil refining, steel reinforcing rod manufacturing, aluminum extrusion and fabrication, flour milling, aircraft servicing, electronics, garment and furniture manufacturing. Other potential new industries, including oceanography, space and astronomical research, a State sponsored free trade zone located at Honolulu, expansion of the University of Hawaii and East-West Center facilities, modular home manufacturing, roofing tile production, centers for advanced studies ("Think-Tanks"), and trade information will further enhance the Hawaiian economy.



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B. Hawaii County

The County of Hawaii is coterminous with the Island of Hawaii, the largest in the Hawaiian chain. It covers an area of about 4,038 square miles and is nearly twice the combined size of all the other islands in the State; hence, it is commonly referred to as the Big Island. It is a land of very diverse climatic and topographical features, ranging from tropical rain forests to snow-capped mountains to dry desert areas. There are active volcanoes; black, white and green sand beaches; inert lava fields; and rich productive agricultural lands.

The economy of the Big Island is based to a considerable extent on agriculture, with sugar being the dominant production crop. In 1974, Hawaii County was the leading county in terms of value of crops and livestock sales (\$199 million of which sugar accounted for \$165 million). Six sugar companies in 1974 produced 3.6 million tons of unprocessed cane. These companies employ approximately 1,480 persons. Hawaii County also raised about 73 percent of the fruits and over 33 percent of the vegetables grown in the State. The balance of the agricultural industry includes macadamia nuts, Kona coffee, orchids, antheriums and other tropical flowers.

As with the State, tourism is the Island's fastest growing industry. According to the Hawaii Visitors Bureau an estimated 742,800 visitors arrived in Hawaii County in 1974. This represents a 7.01 percent increase over 1973 and is 3.7 times the 203,000 estimated visitors to the island in 1965. Hawaii County currently has 6,045 hotel units; 3,423 in Kona, 2,167 in Hilo-Hamakua and 455 scattered throughout the Island. Plans have been proposed for the construction of 3,224 additional hotel units within the county. Tourism is expected to continue at a very active pace in the future, particularly on the neighbor islands, as resort facilities are disbursed from Waikiki.

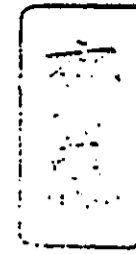
Scientific research is also beginning to affect the economy of the Big Island. The County offers unique and natural advantages for aspects of scientific research, particularly astronomy, geophysics and volcanology. The National Aeronautics and Space Administration and the University of Hawaii operate an 88 inch telescope and observatory on Mauna Kea. The world's third largest telescope will be installed on top of Mauna Kea by means of a joint venture with the governments of France, Canada and the University of Hawaii.

Education is another increment of potential growth for the Island. The Hilo Campus of the University of Hawaii currently is the only other campus outside the main one in the Manoa Valley in Honolulu.

Selected economic trends for the County are shown in Table 4 following.

1. Population

As of July 1, 1974 Hawaii County had a resident population of 72,200 persons or 9.1 percent of the State total. From the late fifties until 1968, the County's population remained relatively stable at about 60,000 persons. Since that time there has been an increase of 20.3 percent or an annual average growth rate of approximately 3.4 percent per year. In fact, it appears that Hawaii County's share of State-wide civilian population is increasing, reversing a pattern of decline from 1955. This trend is shown in Table 5. The districts having the greatest growth rate between 1960 and 1970 were South Hilo, South Kohala and North Kona.



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2. Employment

From Table 4, it can be seen that the number of jobs filled in Hawaii County declined slightly from 1959 to 1961, but since then has increased steadily. Although population was almost constant from 1961 to 1967, employment increased 15 percent. From 1966 to 1969, employment increased 2,420 persons, and between 1970 and 1973, the gain increased to 3,100 persons.

The method of determining employment was changed in 1973 from the basis of jobs filled to the number of persons employed. Data before 1970 have not been revised to reflect this change so that historical employment statistics cannot be used for comparison with those of recent years.

Comparisons can be made though between 1973 and 1974. On a year-to-year basis, employment in Hawaii County increased from 28,600 in July 1973 to 29,000 in July 1974, a gain of 400, or 1.4 percent. However, unemployment grew from 7.8 percent to 9.2 percent.

Per capita income for the Hawaii County in 1972 was \$3,685, below the State at \$5,153, and the City and County of Honolulu at \$5,359 for the same period.

3. Housing

According to the 1970 U.S. Census there were 18,972 housing units in Hawaii County, of which 9,815 were owner occupied, 7,445 were renter occupied and 1,712 were

Table 4
ECONOMIC TRENDS - COUNTY OF HAWAII: 1958 to 1974

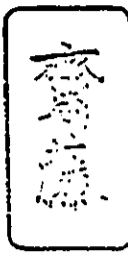
Year	Resident Population July 1	Employment (1)		Wages and Salaries		Hotel Units, End of Year	Assessed Valuation of Real Property (2) (\$1,000)
		Civilian Employ- ment	Percent Unemployed	Total Annual Amount (\$1,000)	Per Worker (\$)		
1958	61,264	20,040	3.9	28,053	3,165	N.A.	90,855
1959	60,550	21,590	2.7	40,694	3,463	581	94,734
1960	60,928	21,520	3.4	44,997	3,535	N.A.	125,709
1961	60,233	21,300	4.0	42,926	3,648	N.A.	125,608
1962	59,568	21,330	4.1	39,689	3,777	692	130,910
1963	59,573	21,370	4.6	43,230	3,947	742	140,796
1964	59,176	21,820	4.5	48,535	4,310	865	162,905
1965	59,712	23,100	4.0	55,220	4,458	1,387	174,697
1966	59,686	23,930	3.9	59,048	4,595	1,790	206,693
1967	59,755	24,520	4.0	62,627	4,793	2,188	234,874
1968	60,965	25,990	3.1	72,857	5,163	2,480	253,315
1969	62,707	26,350	3.1	81,581	5,529	3,166	293,135
1970	64,400	26,300	4.0	111,745	6,184	3,486	427,152
1971	67,900	27,400	6.3	123,877	6,627	4,241	525,510
1972	68,600	27,900	6.9	135,744	7,097	4,796	655,985
1973	71,600	28,600	7.8	147,841	7,352	5,234	734,214
1974	72,200	29,000	9.2	N.A.	N.A.	5,348	900,304

N.A. - Not Available

(1) Definitions changed for data after 1970.

(2) Valuation for tax rate purposes, at approximately 60 percent of market value.

Source: State Department of Planning and Economic Development, State Department of Labor and Industrial Relations, Hawaii Visitors Bureau.



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Table 5
RESIDENT POPULATION
Hawaii County and State of Hawaii, 1955 - 1974



<u>Year</u> (1)	<u>State</u>	<u>Hawaii County</u>	<u>Percent of State</u>
1955	482,485	63,079	13.1
1956	501,329	62,654	12.5
1957	524,885	62,558	11.9
1958	550,345	61,264	11.1
1959	565,491	60,550	10.7
1960	582,337	60,928	10.5
1961	597,872	60,233	10.1
1962	604,536	59,568	9.9
1963	622,679	59,573	9.6
1964	626,684	59,176	9.4
1965	650,423	59,712	9.2
1966	656,267	59,686	9.1
1967	666,547	59,755	9.0
1968	677,443	60,965	9.0
1969	701,754	62,707	9.0
1970	721,214	64,400	8.9
1971	744,900	67,900	9.1
1972	764,178	68,600	9.0
1973	783,041	71,600	9.1
1974	792,281	72,200	9.1

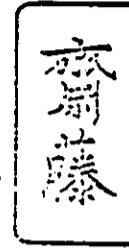
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(1) As of July 1.

Source: County of Hawaii, Department of Research and Development, Department of Planning and Economic Development, State of Hawaii, Hastings, Martin, Hallstrom and Chew, Ltd.

vacant. All but 2,195 were in single family structures. Five-sixths of the total had fully standard plumbing (even though many were located in the rural areas).

Half of all owner occupied units were worth an estimated \$24,000 or more, including land. The median contract rent was \$56 per month. This relatively low rental figure for housing units is due to the number of plantation subsidized rentals which are lower than the prevailing rates.



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4. Transportation

Hawaii County has deep water ports at Hilo and Kawaihae. Container service is available at Hilo; barge service is available at both ports.

State airports at Hilo, Keahole and Waimea-Kamuela serve as terminals for interisland passengers and freight traffic. There is direct air service between Hilo and the mainland. Aloha Airlines and Hawaiian Airlines provide frequent daily interisland flights. Air taxi and charter services are also available. A new hydrofoil ferry service began in early 1976.

In 1974 there were 50,626 motor vehicles registered in Hawaii County and approximately 1,371 miles of improved roads and scenic highways.

5. Retail Business

The most recent data available with respect to retail business in Hawaii is contained in the 1972 U.S. Census of Business which was published in 1974.

Table 6 depicts the growth in the number of retail establishments and total sales volume for Hawaii County and the urban area of Hilo.

Table 6
RETAIL ESTABLISHMENTS AND SALES
Hawaii County, 1963 - 1972

Area	Number of Establishments		Sales (\$1,000)		Percent Change 1967-1972	
	1963	1967	1963	1967	No.	Sales
State	4,578	5,212	\$751,411	\$1,083,458	22.64	72.13
Hawaii County	564	642	61,094	83,635	18.85	99.92
Hilo	310	362	44,225	58,975	9.39	100.73
Other	254	280	16,869	24,660	31.07	97.98

Source: 1972 U.S. Bureau of the Census, Census of Retail Establishments.



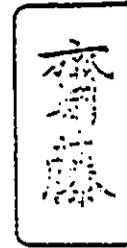
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EXTRACTS FROM HAWAII COUNTY ZONING ORDINANCE (ORDINANCE 63 - CHAPTER 8 HAWAII COUNTY CODE)

DISTRICT DESIGNATION	DISTRICT	PERMITTED USES	HEIGHT LIMIT	MINIMUM BUILDING SETBACKS	MINIMUM BUILDING SETBACKS	MINIMUM BUILDING SETBACKS	OTHER REGULATIONS
RS	RESIDENTIAL SINGLE-FAMILY DETACHED	Single-family detached dwellings, accessory uses, and uses incidental to the residential use.	35 feet	5 feet	5 feet	5 feet	...
RD	RESIDENTIAL SINGLE-FAMILY DETACHED	Single-family detached dwellings, accessory uses, and uses incidental to the residential use.	35 feet	5 feet	5 feet	5 feet	...
RM	RESIDENTIAL MEDIUM-DENSITY	Single-family detached dwellings, accessory uses, and uses incidental to the residential use.	35 feet	5 feet	5 feet	5 feet	...
RA	RESIDENTIAL SINGLE-FAMILY DETACHED	Single-family detached dwellings, accessory uses, and uses incidental to the residential use.	35 feet	5 feet	5 feet	5 feet	...
A	AGRICULTURE	Uses incidental to agriculture, including but not limited to: agricultural buildings, structures, and equipment; and uses incidental to the agricultural use.	35 feet	5 feet	5 feet	5 feet	...
U	UNDESIGNATED	Uses not specifically listed in other districts.	35 feet	5 feet	5 feet	5 feet	...
V	VEHICLE SALES AND SERVICE	Uses incidental to vehicle sales and service, including but not limited to: car washes, repair shops, and parts stores.	35 feet	5 feet	5 feet	5 feet	...
CO	COMMERCIAL OFFICE	Uses incidental to commercial office, including but not limited to: offices, banks, and professional services.	35 feet	5 feet	5 feet	5 feet	...
GN	GENERAL BUSINESS	Uses incidental to general business, including but not limited to: retail stores, restaurants, and service businesses.	35 feet	5 feet	5 feet	5 feet	...
CG	COMMERCIAL GENERAL	Uses incidental to commercial general, including but not limited to: large retail stores, warehouses, and industrial uses.	35 feet	5 feet	5 feet	5 feet	...
CV	COMMERCIAL VEHICLE SALES AND SERVICE	Uses incidental to commercial vehicle sales and service, including but not limited to: car washes, repair shops, and parts stores.	35 feet	5 feet	5 feet	5 feet	...
ML	MEDIUM-DENSITY RESIDENTIAL	Uses incidental to medium-density residential, including but not limited to: townhomes and multi-unit dwellings.	35 feet	5 feet	5 feet	5 feet	...
MG	MEDIUM-DENSITY RESIDENTIAL	Uses incidental to medium-density residential, including but not limited to: townhomes and multi-unit dwellings.	35 feet	5 feet	5 feet	5 feet	...
O	OFFICE	Uses incidental to office, including but not limited to: offices, banks, and professional services.	35 feet	5 feet	5 feet	5 feet	...

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INTERIM COASTAL ZONE MANAGEMENT
County of Hawaii, Hawaii



Purpose

It is the State policy to preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii. Until a general coastal zone management program can be developed and implemented, special interim controls on development within an area along the shoreline are necessary to avoid permanent loss of valuable resources and the foreclosing of coastal zone management options, and to insure that adequate public access to public-owned or used beaches, recreation areas, and natural reserves is provided by dedication or other means.

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Special Management Areas

Maps prepared by the Agency and filed with the Authority by December 1, 1975, shall delineate certain areas along the coastlines of the County of Hawaii, which areas shall be the official special management areas to be administered and enforced by these rules and regulations, excluding therefrom such areas otherwise exempted by State or Federal laws.

"Special Management Area" means the land area extending not less than 100 yards inland from the shoreline, including the surrounding area extending 100 yards from the border of any body of surface water subject to salinity intrusion or tidal influences and the waters themselves, as delineated on the maps established by the Agency and filed with the Authority and the office of the County Clerk.

Guidelines

The following guidelines shall be used by the Authority for the review of proposals in the special management areas:

- A. All developments or structures in the special management areas shall be subject to reasonable terms and conditions set by the Authority based on the following:
1. Provide adequate access, by dedication or other means, to public-owned beaches, recreation areas, and natural reserves to the extent consistent with sound conservation principles;
 2. Preserve adequate and properly located public recreation areas and wildlife preserves;
 3. Provide for solid and liquid waste management, treatment and disposition which will minimize adverse effects upon special management area resources;

4. Alterations to existing land forms, vegetation except cultivation of crops and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimize danger of floods, landslides, erosion, siltation, or failure in the event of earthquake.

B. No proposal shall be approved unless the Authority has first found that:

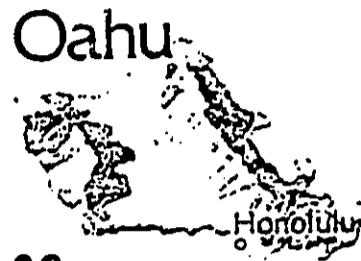
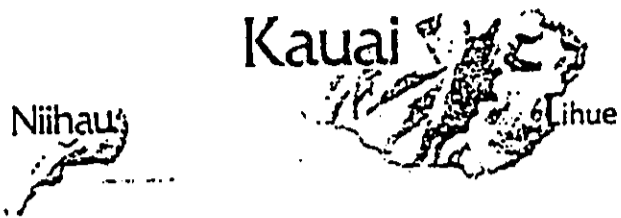
1. The development or structure will not have any substantial, adverse environmental or ecological effect except as such adverse effect is clearly outweighed by public health and safety. Such adverse effect shall include, but not be limited to, the potential cumulative impact of singular developments or structures, each one of which considered individually might not have a substantial adverse effect and cause the foreclosure of coastal zone management options;
2. The development or structure is consistent with the policies set forth in Section 7.

C. The Authority shall seek to minimize, where reasonable:

1. Dredging, filling, or any altering of any bay, estuary, salt marsh, river mouth, slough, or lagoon.
2. Any development or structure which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management areas and the mean high tide line where there are no beaches.
3. Any development or structure which would reduce the size of any beach or other area usable for public recreation.
4. Any development or structure which would substantially interfere with or detract from the line of sight toward the sea from the State highway nearest the coast.
5. Any development or structure which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, estuarine sanctuaries, potential or existing agricultural uses of lands.



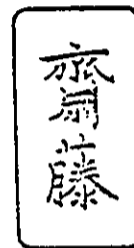
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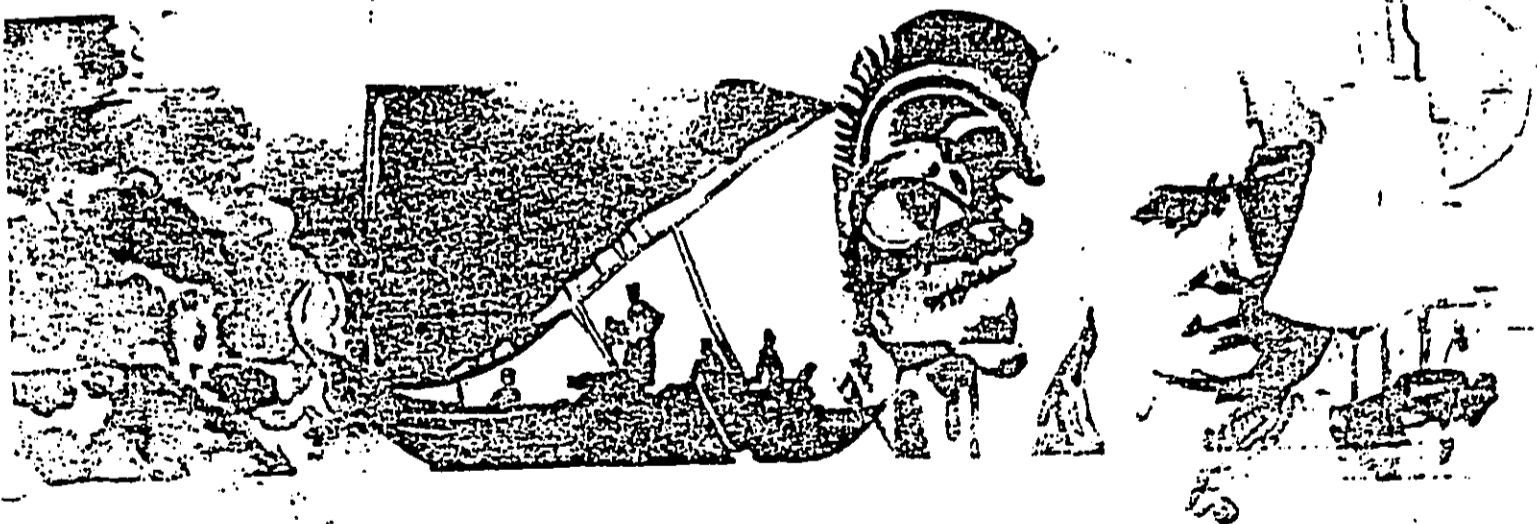
An Introduction to Beautiful Hawaii

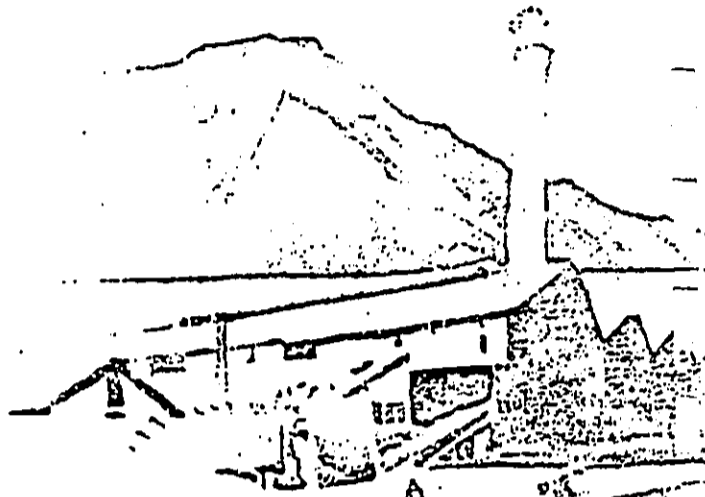
Some 25 million years ago, molten lava began to bubble up out of a fissure at the bottom of the sea. This was the beginning of the Hawaiian Ridge, the great range of volcanic mountains that today stretches for 1,600 miles across the Pacific Ocean just below the Tropic of Cancer. From ocean depths of more than 15,000 feet, the highest peaks rise above the surface of the sea to form the islands, islets, and atolls of the Hawaiian chain. Measured from the ocean floor, Mauna Kea on the island of Hawaii is the tallest mountain in the world, rising 13,796 feet above sea level and extending 19,680 feet below—a total of 33,476 feet.

Now once-bare lava slopes support gardens that blaze with bougainvillea, anthuriums, bird-of-paradise plants, orchids, hibiscus, and plumeria. Cattle range over cool grasslands below mountain summits that are tipped with snow in winter. Waterfalls spill from ginger-laden cliffs into clear, fern-banked



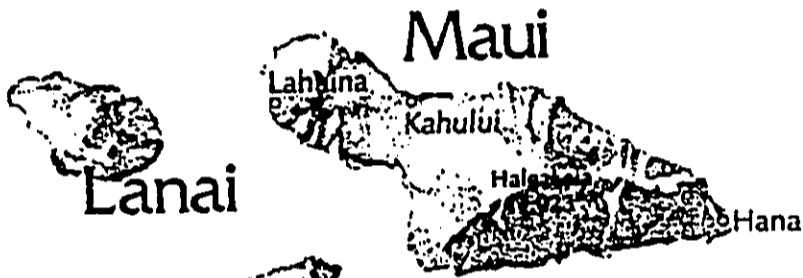
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Molokai

Kaunakakai



Maui

Lahaina

Kahului

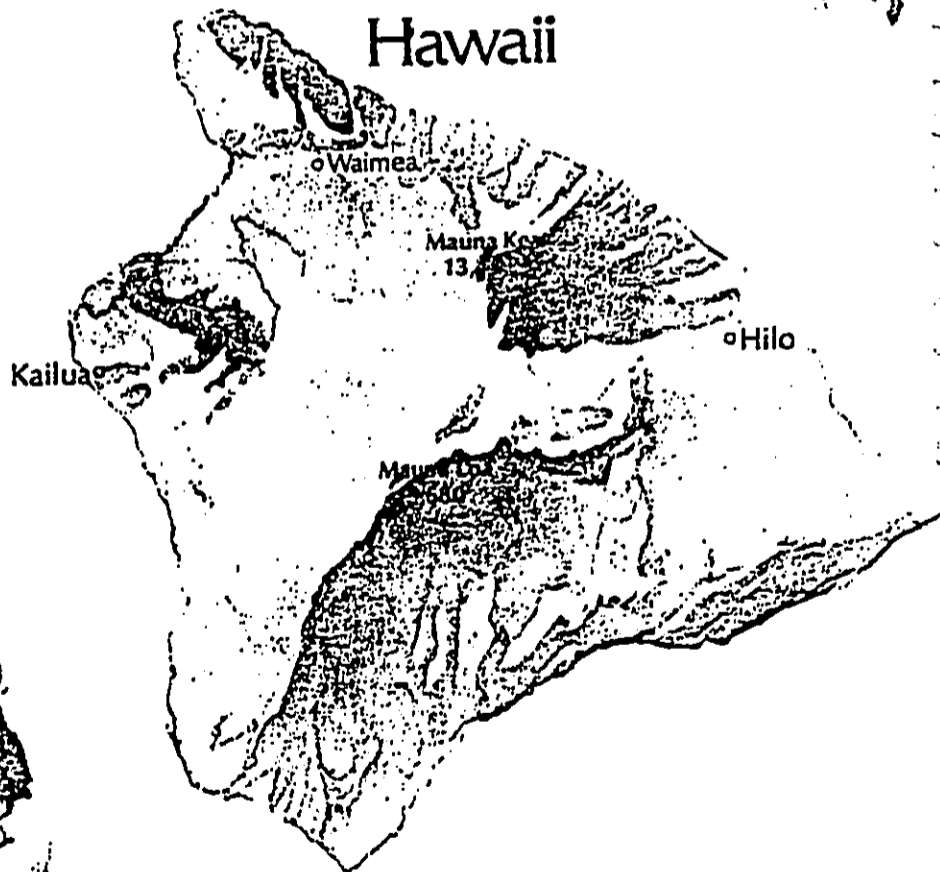
Hana

Hana

Lanai



Kahoolawe



Hawaii

Waimea

Mauna Kea

13

Kailua

Hilo



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Consulting Engineer

pools. Billowing fields of sugar cane and neat rows of pineapple spread over thousands of fertile acres.

The major islands today are the eight that lie at the southeastern end of the chain. Seven of these are inhabited; the eighth, Kahoolawe, is used by the Navy for bombing and gunnery practice. Hawaii is the largest island—and is usually referred to as “the Big Island.” With an area of 4,035 square miles, it is almost twice as large as all of the other Hawaiian islands combined. The Big Island boasts two mountain peaks that rise more than 13,000 feet from sea level, two active volcanoes, and a national park. Its varied climate and terrain provide great contrasts in scenery: sugar plantations, truck farms, cattle ranches, resorts, lush fern forests, orchards, flower fields, coffee plantations, and great expanses of lava.

Maui is the second largest island. It has some of the most magnificent beaches in Hawaii, a variety of resort areas, a refurbished whaling port, and the vast, colorful crater of dormant Haleakala.

West and northwest of Maui, the islands of Lanai and Molokai are quiet and comparatively undeveloped. Most of Lanai is owned by Dole Pineapple Company. Visitors are welcome, but tourist facilities are almost nonexistent. Much of Molokai is ranch land, though resort development is beginning.

Oahu, third island in size, is first in number of people. Honolulu, the state capital, is located here, as are such famous landmarks as Diamond Head, Waikiki, and Pearl Harbor.

Westernmost of the main islands are Kauai and Niihau. Kauai is a mixture of sugar cane fields, resort areas, homes, and ranches. Lush vegetation blankets its mountains. Its volcanic summit, Waialeale, receives more than 400 inches of rainfall annually and is reputed to be the wettest place on earth. Tiny Niihau is privately owned and can be visited only by special invitation. Its residents are mostly pure Hawaiians who live simply, without electricity, automobiles, or television.

Stretching beyond Niihau is a series of tiny islets and atolls officially named the Northwestern Hawaiian Islands but still commonly called the Leeward Islands. Volcanic activity began at this end of the chain. Kure and Midway are the oldest of the islands; Hawaii, where volcanic activity still continues, is the youngest. The islands at the northwest are estimated to be five to ten million years old, the main islands two to five million. Military installations on French Frigate Shoals, Midway, and Kure are the only marks of human habitation in the northwestern group.

The islands from Nihoa to Pearl and Hermes Reef comprise the Hawaiian Islands National Wildlife Refuge, established in 1909 to protect some of the most important sea bird nesting colonies in the world. Four endangered

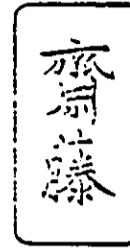
species of birds—the Laysan duck, Laysan finch, Nihoa finch, and Nihoa millerbird—are protected here, and the bare slopes and steep cliffs of these remote land bits are home to thousands of other birds. Also protected here are the rare Hawaiian monk seal and the green sea turtle.

The most generally accepted theory on the origins of the people who first settled in the Hawaiian Islands is that they came from Southeast Asia, following routes that took them down through the islands of Indonesia. From there they continued their migrations eastward to island dots in the vast Pacific. Eventually these early explorers reached all of the island groups in the Polynesian triangle formed by New Zealand at the southwest, Easter Island at the southeast, and the Hawaiian Islands at the north. It is thought that the first Polynesians to reach Hawaii sailed up from the Marquesas about 750 A.D. Heavy migrations from Tahiti came later, during the 12th and 13th centuries.

The voyagers traveled in huge double-hulled canoes, 60 to 80 feet long. A center platform between the hulls supported a thatched hut for shelter. They brought with them pigs, chickens, dogs, and plants that would provide food both during the long sea journey and in their new land. These early Hawaiians introduced many plants to the islands, including taro, which was their principal food crop, bananas, breadfruit, coconuts, sugar cane, yams, sweet potatoes, and mountain apples.

Somehow the islands of the Hawaiian archipelago eluded the European navigators of the 16th and 17th centuries. It was not until January 18, 1778, that English explorer Captain James Cook, on his third voyage in the Pacific, came upon the western end of the Hawaiian chain, sighting first Kauai, then Oahu, then Niihau. Cook made his first landing at Waimea on the island of Kauai. After a fortnight in the islands—which he named the Sandwich Islands in honor of his patron, the fourth Earl of Sandwich—he sailed on to Alaska.

In November, Captain Cook returned to the tropical shores he had discovered earlier. This time he sighted Maui, Molokai, and lastly, the big island of Hawaii at the eastern end of the chain. On January 17, 1779, his two ships,



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the *Discovery* and the *Resolution*, sailed into Kealahou Bay. Here the natives welcomed him as their god Lono, whose special celebration was held during the *makahiki*, or harvest, season—the time when Captain Cook chanced to appear.

Cook left the islands again on February 4 but soon returned after a sudden storm hit the ships off the coast of Kohala, collapsing the foremast of the *Resolution*. Ten days later, on February 14, the captain died at the edge of the bay—clubbed and stabbed to death during an altercation between his men and the natives, involving a cutter stolen from one of the ships.

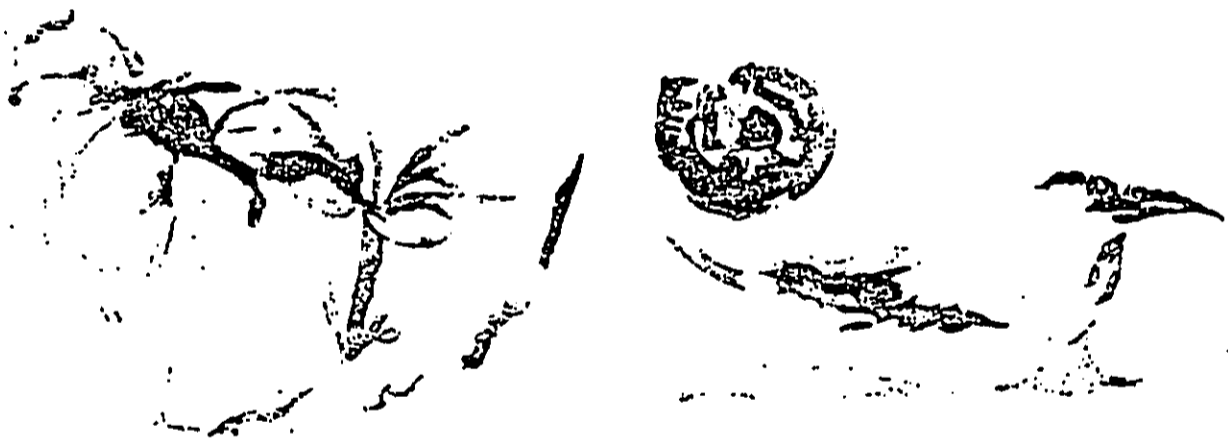
At the time of Captain Cook's arrival, the islands were divided into four kingdoms, each with a ruling chief. Wars were frequent among them. Kalaniopuu was chief of the island of Hawaii. His nephew, a young warrior from Kohala by the name of Kamehameha, was destined to become ruler of the entire island chain and the first of the eight monarchs that were to rule the island kingdom.

When the aging Kalaniopuu neared death, he named his highest-born son, Kiwalao, as his successor. To Kamehameha he gave the guardianship of the family war god, Kukailimoku. It was not long before strife developed between Kiwalao and Kamehameha. In a battle in 1782, Kiwalao was killed, but it took Kamehameha nine more years to gain control of all of the island of Hawaii. One by one, the other islands fell to Kamehameha. Early in 1795, he captured Maui, Lanai, and Molokai. In mid-April he landed his canoes at Waikiki on Oahu.

Victory over the Oahuans came after a bloody battle in which Kamehameha's forces drove the enemy inland and trapped them at the edge of the steep cliffs



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of Nuuanu Pali, where many were killed and many more leaped to their deaths. Now, all of the islands were under Kamehameha's rule except for Kauai and Niihau, and these came into his realm peacefully in April 1810 when Kaumualii, king of Kauai, entered into a pact with Kamehameha making Kauai a tributary kingdom in which Kaumualii would continue to govern Kauai but would accept Kamehameha's sovereignty.



For 77 years, Kamehamehas ruled the island kingdom. Their reign ended on December 11, 1872, when Kamehameha V, a bachelor, died on the morning of his 43rd birthday. He left no heir to the throne and had named no successor. The next sovereign, William Lunalilo, was chosen by the Legislature. When he too died a bachelor, the Legislature elected David Kalakaua to rule the islands. Upon Kalakaua's death, his sister, Liliuokalani, took the throne. She reigned until the monarchy was overthrown on January 17, 1893. A provisional government then ruled the islands until the Republic of Hawaii was established on July 4, 1894.

As more and more foreigners landed in the islands, foreign intervention in Hawaiian affairs became extensive, and so did rivalry for favors. Ships of England, France, Russia, and the United States made frequent visits to island ports, and Hawaii became a popular wintering place for ships en route to China with cargoes of furs collected during the summer along the northwest coast of the U.S. mainland. Trade in sandalwood thrived from 1811 until the supply was exhausted in 1830. Then whaling took over as the mainstay of Hawaii's economy, and whaleships flocked to Hawaiian ports.

During the first half of the 19th century, a number of foreign powers made attempts to establish their positions in the islands. In 1816 the Russians erected a fort at Waimea on Kauai. The following year they were expelled by the king of Kauai under strict orders from Kamehameha. Protestant missionaries arrived in Hawaii from Boston in April of 1820 and began to teach the natives Christian principles, reading, writing, and arithmetic, and the rudiments of democracy. France's interest in the islands was expressed by the arrival of the first Roman Catholic missionaries from France in 1827. For five months in 1843, the islands were actually under the British flag after they were seized by a British naval officer, Lord George Paulet. The British government later disavowed Paulet's act, and the kingdom was returned to Kamehameha III.

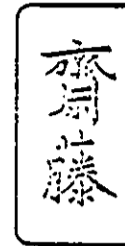
Beginning in 1840, negotiations got under way to assure Hawaii's independence. On November 28, 1843, Britain and France signed a declaration recognizing the independence of the Hawaiian kingdom. The following summer, the United States reaffirmed its recognition of Hawaii's independence.

The whaling industry, which reached its peak in 1852, went into a steady decline following the discovery of petroleum in Pennsylvania in 1859.



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Misfortunes helped to bring about its demise, including a growing scarcity of whales and the losses of many whaling ships during the Civil War. The death blow to the industry came in 1871 when 33 ships, including seven of Hawaiian registry, were lost when they became trapped in Arctic ice north of Bering Strait.



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Conversion to agriculture came about gradually. Sugar led the way—the top-ranking crop then as it is today. The first successful plantation was opened in 1835 at Koloa, Kauai. Other mills followed, and other crops were planted. The sugar industry expanded rapidly following the signing of a reciprocity treaty between Hawaii and the United States in 1875, permitting duty-free exchange of products between the two countries. Rice was grown to supply the needs of the Chinese. Coffee plantations were started on Kauai, Oahu, and on the Big Island. There were short-lived attempts to grow tobacco, cotton, wheat, and potatoes, and to raise silkworms for a silk industry. Cattle ranches covered many acres of the Big Island and Maui. Some pineapple was grown, though the pineapple industry did not really get under way until the early 1900s after the Hawaiian Pineapple Company was organized by James D. Dole in 1901.

The mid-19th century brought extensive growth in agriculture and trade in Hawaii. It also brought a shortage of laborers needed to work on the plantations. There simply were not enough Hawaiians to fill the need. In 1852



the first Chinese laborers were brought to the islands under five-year contracts. Other races followed—the first Japanese in 1868, Portuguese from Madeira and the Azores in 1878, Spanish in 1898, Koreans and Filipinos in the early 1900s. Some of these immigrants returned to their homelands after their contracts expired, but many stayed on in the islands. Some went into business for themselves. Many married Hawaiian women, and over the generations racial strains have become more and more complex. Today pure Hawaiians and part Hawaiians make up only one sixth of the state's population. One fourth of Hawaii's people are of mixed blood strains.

During the reign of Queen Liliuokalani, strong feelings grew among island businessmen favoring the annexation of Hawaii to the United States. The Spanish-American War finally convinced the United States government of the strategic position of the Hawaiian Islands in the Pacific and helped to turn the tide in favor of annexation. The sovereignty of the Republic was transferred in a ceremony at Iolani Palace at noon on August 12, 1898. However, it was not until almost two years later, on June 14, 1900, that the territorial government actually went into effect and Sanford B. Dole was appointed governor.

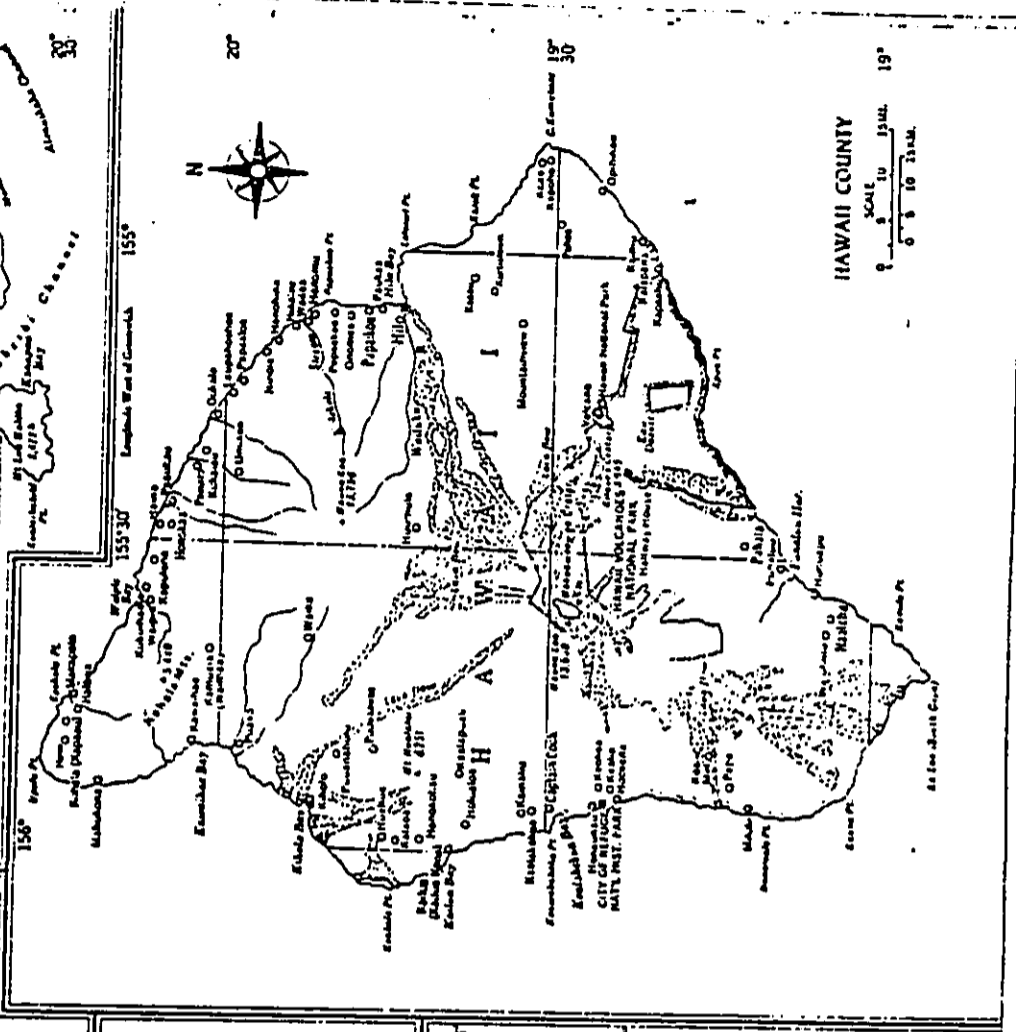
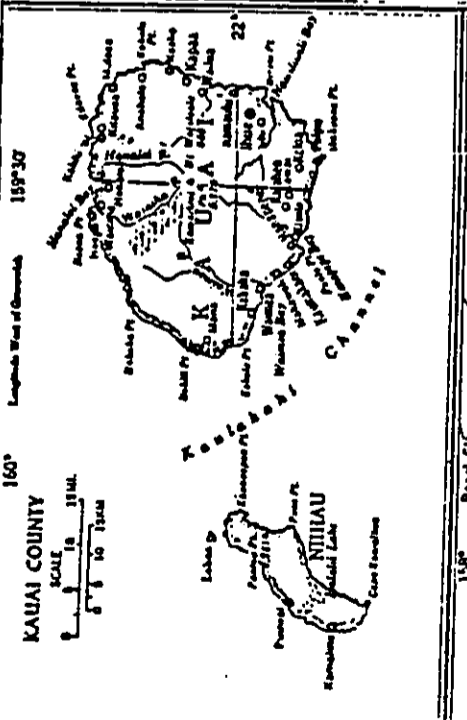
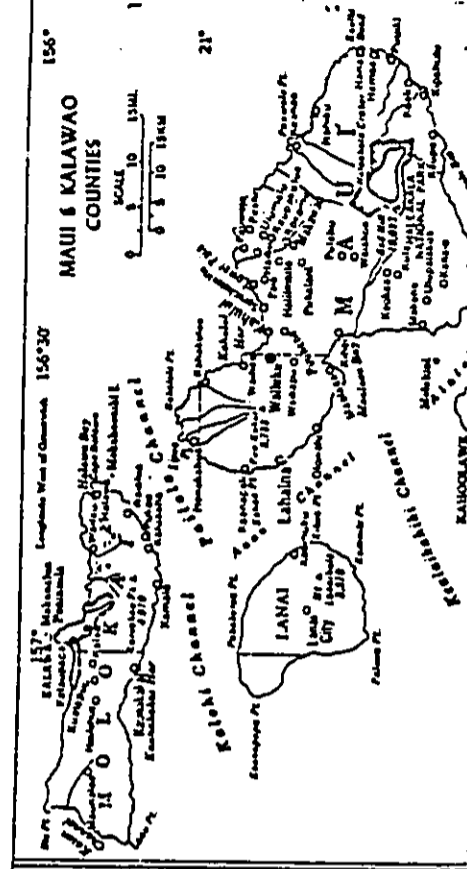
The struggle for statehood for Hawaii began as early as 1903. The first statehood bill was introduced in 1919, and others followed with regularity after that. Efforts at statehood were put aside during the tense period of World War II following Japan's surprise attack on Pearl Harbor on the morning of December 7, 1941. During the war years, Hawaii became America's defense post in the Pacific. Pearl Harbor was headquarters for the Pacific fleet, and Schofield Barracks was the largest Army post under the United States flag.

Efforts to gain statehood began again right after the war. But it was not until March 11, 1959, that Congress finally passed the enabling act. On August 21 of that year, President Dwight D. Eisenhower signed the proclamation that made the "Aloha State" the 50th star in the United States flag.

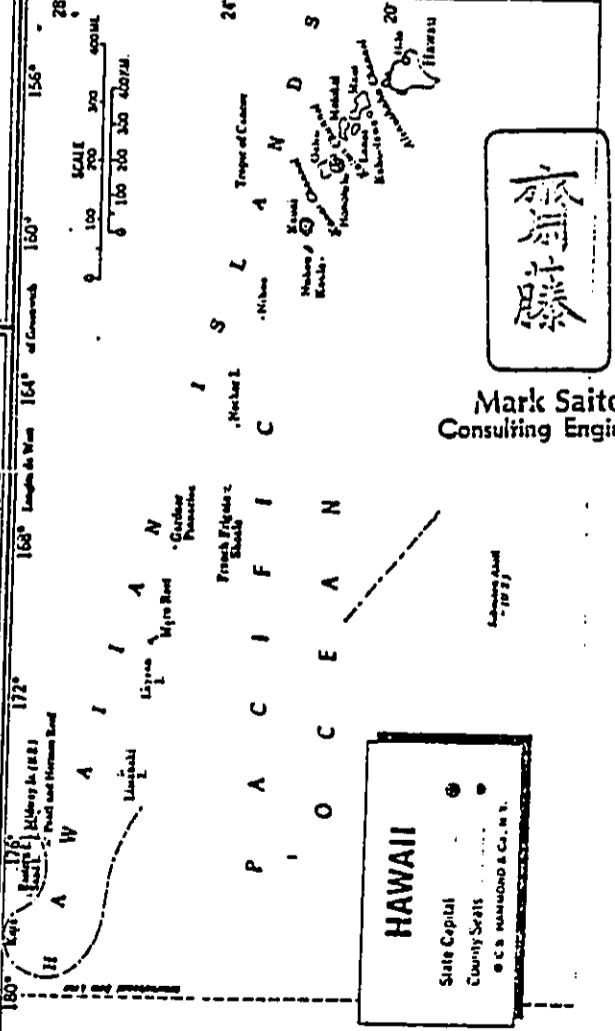


Mark Saito
Consulting Engineer

aloha!



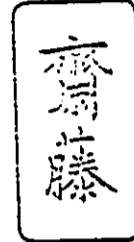
Map below shows relative position of the islands comprising the State of Hawaii. The other maps show the more important island counties in detail.



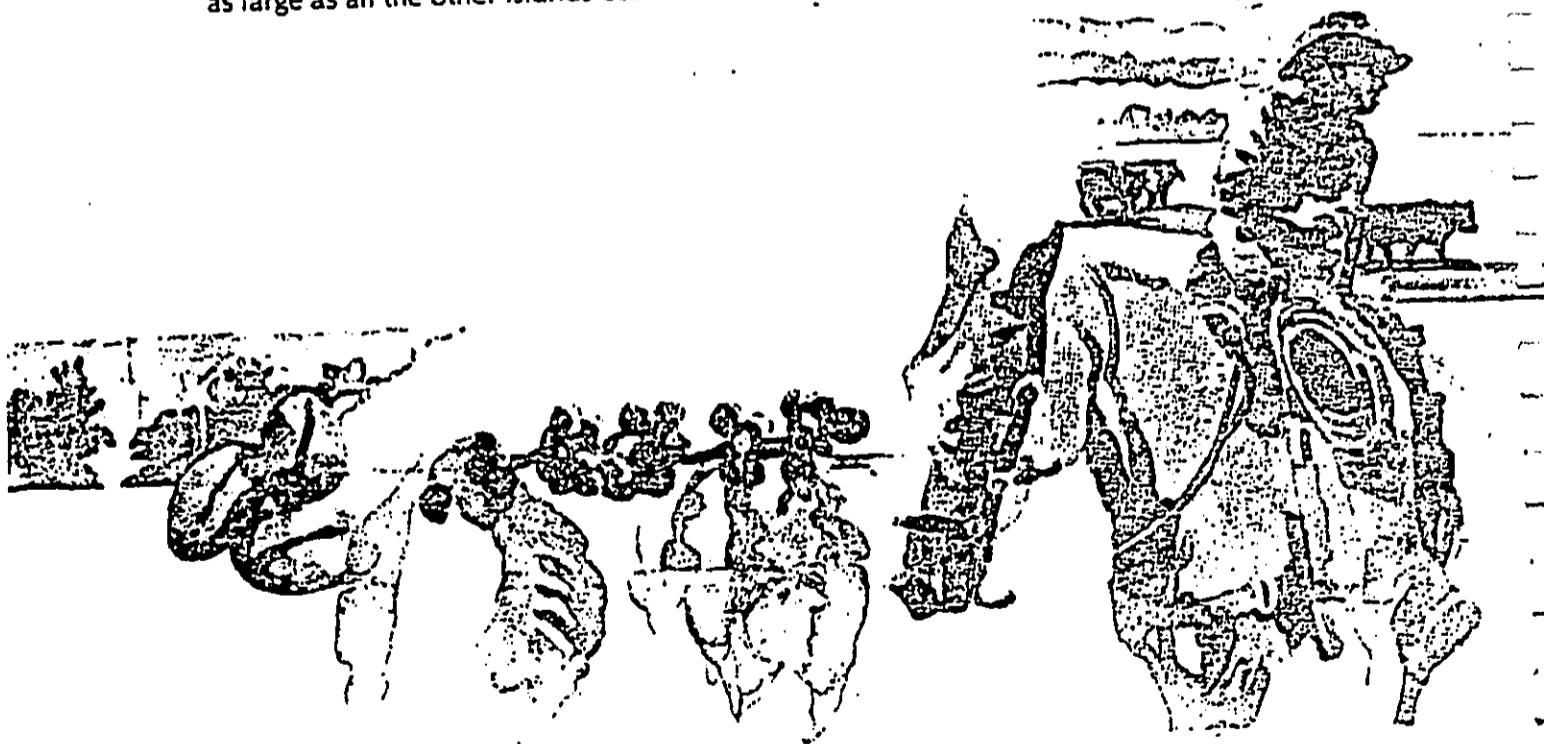
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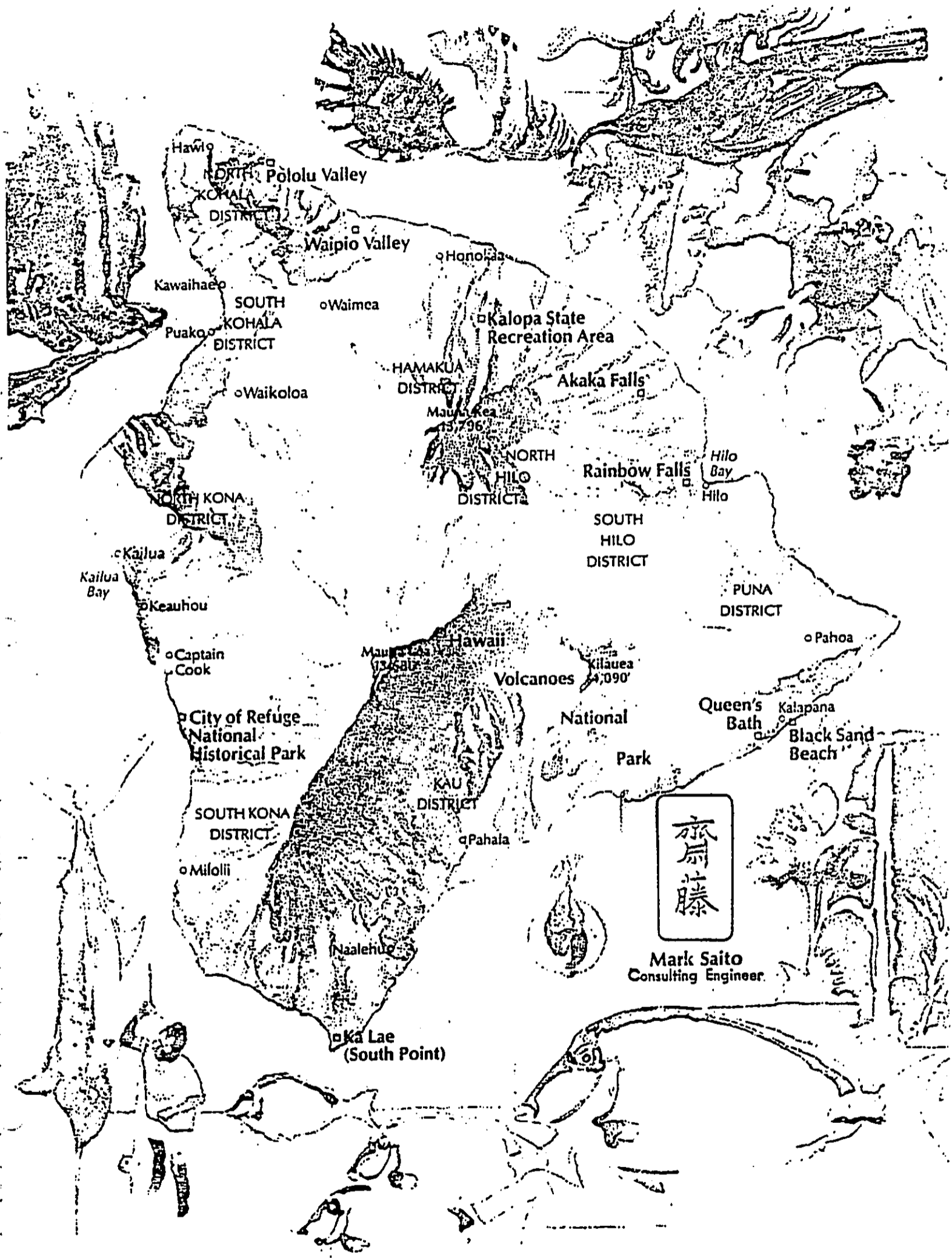
Hawaii

Clouds brush the summits of Mauna Kea and Mauna Loa, the huge mountains that dominate the Big Island. Between mountain peaks and sea lie rain forests, weird lava formations, fertile grasslands, colorful gardens, orchards, truck farms, sugar and coffee plantations, and cattle ranches. The Neighbor Islands' largest town, Hilo, sprawls alongside crescent-shaped Hilo Bay. In the northwest corner of the island, a remarkably untouched bit of Hawaii survives in North Kohala, birthplace and boyhood home of the first Kamehameha. Up on the cool Waimea plateau, mists swirl over forest-capped hills and green grazing land. A few miles away, resort complexes lie along a dry, sunny coast. In beautiful, isolated valleys on the northeast coast, a luxuriant growth of native plants and trees is watered by abundant year-round rainfall and streams fed by winter snows that frequently dust Mauna Kea's summit. This big island, youngest in the Hawaiian chain, is still growing. Of the five volcanoes that formed Hawaii, two are still active. Mauna Loa, largest active volcano in the world, ended a 25-year quiet period with a summit eruption in 1975. Lively Kilauea, down on Mauna Loa's southeast flank, puts on frequent fiery shows, occasionally sending lava spilling all the way to the sea and adding more land area to an island already almost twice as large as all the other islands combined.



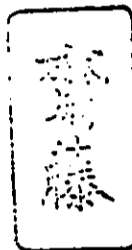
Mark Saito
Consulting Engineer





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Mark Saito
Consulting Engineer.



Mark Saito
Consulting Engineer

NEWSPAPER ARTICLES
PERTINENT TO DEVELOPMENT
PROJECTS ON HAWAII



Mark Saito
Consulting Engineer

*Inouye Help Enlisted for Big Island Road

6/24/78

By Llewellyn Stone Thompson
Star-Bulletin Writer

HILO — Hawaii County Councilman William Kawahara of Kona has secured the aid of U.S. Sen. Daniel K. Inouye for his pet project of building a cross-island highway through the saddle area between Mauna Kea and Mauna Loa.

Kawahara yesterday made public letters from Inouye to state Transportation Director Ryokichi Higashionna and Maj. Gen. Herbert E. Wolf, whose command includes the Pohakuloa Training Area in the saddle.

In the May 12 letter to Wolf, Inouye noted the importance of a direct link between Hilo and Kona and proposed that such a highway go directly through Pohakuloa.

INOUE SAID public sentiment might eventually force the Army to abandon all 120,000 acres at Pohakuloa if an accommodation was not reached.

In the June 13 letter to Higashionna, Inouye urges the Department of Transportation to fund improvements to the existing saddle road beginning next year.

Inouye also suggested to Higashionna that a possible extension of the existing saddle road to Kauhuanu Highway along the South Kohala Coast might make a new Hilo-to-Kona alignment unnecessary.

Kawahara said there is greater need for a cross island highway than ever before, in part, because of the growth of Kona as the Big Island's prime tourist destination area.

Kawahara has been advocating a cross island highway for many years.

A similar proposal by him before the County Council was shot down in 1974 by District Highway Engineer Charles Schuster when he assembled approximately a dozen speakers who testified in either neutral or negative terms about the proposal.

3-18 Friday, July 14, 1978 HONOLULU ADVERTISER

Saudi prince reveals plans for 3 chambers of commerce

By DIANE YUKIHIRO
Advertiser Staff Writer

A royal proclamation of sorts was delivered yesterday in the dining room of the Honolulu International Airport, with a young Saudi Arabian prince looking severely austere in a gray suit and maroon striped necktie.

Prince Abdullah Al Saud held a press conference to announce plans to establish three chambers of commerce in Japan, Korea and Taiwan, with activities coordinated by a Hawaii main office.

His attorney, Khalid Al Mansour, did most of the talking as the 25-year-old prince sat quietly at his side under TV lights and camera flashes.

The prince plans to personally supervise the activities in the Honolulu main office and will live here, Al Mansour said. Al Mansour travels with the prince, and said he is licensed to practice law in the United States.

Al Mansour said they would be meeting with officials of Japan, Taiwan and Korea while visiting the countries in the next few weeks.

"We want to show the people in the countries how to move quickly . . . so more profits will flow," Al Mansour said.

Al Mansour said the prince is interested in land development, agricultural and industrial investments in the state. But he added that the Saudi Arabians are not "interested in creating environmental chaos . . . and we're not only interested in making money."

Both men declined to name the total cost or specific locations of the chambers of commerce or the Honolulu office, but promised further information in the next seven to nine weeks.



AP Photo/Associated Press

Al Mansour (left) and Prince Abdullah

Arabs in the Pacific

They plan to spend up to \$142 Billion Dollars in the Pacific Basin.

Mark Saito
Consulting Engineer





Mark Saito
Consulting Engineer

Days travel exec
direct flights
mainland-to-Kona
are 'natural'
in distant future

By TIM MAHONEY
WHT Staff Writer

Direct flights from the mainland to Ke-ahole Airport are "some time away" but would be "a very natural sequence of events" in the development of west Hawaii's tourism industry, according to Edward Carlson, chairman of UAL, Inc.

Carlson did not, however, specify how far in the future he might expect service to begin.

UAL, Inc., is the parent company of United Airlines and Western International Hotels.

Carlson made his remarks during a wide-ranging press conference after ceremonies marking UAL, Inc.'s purchase of the Mauna Kea Beach Hotel from Laurance Rockefeller.

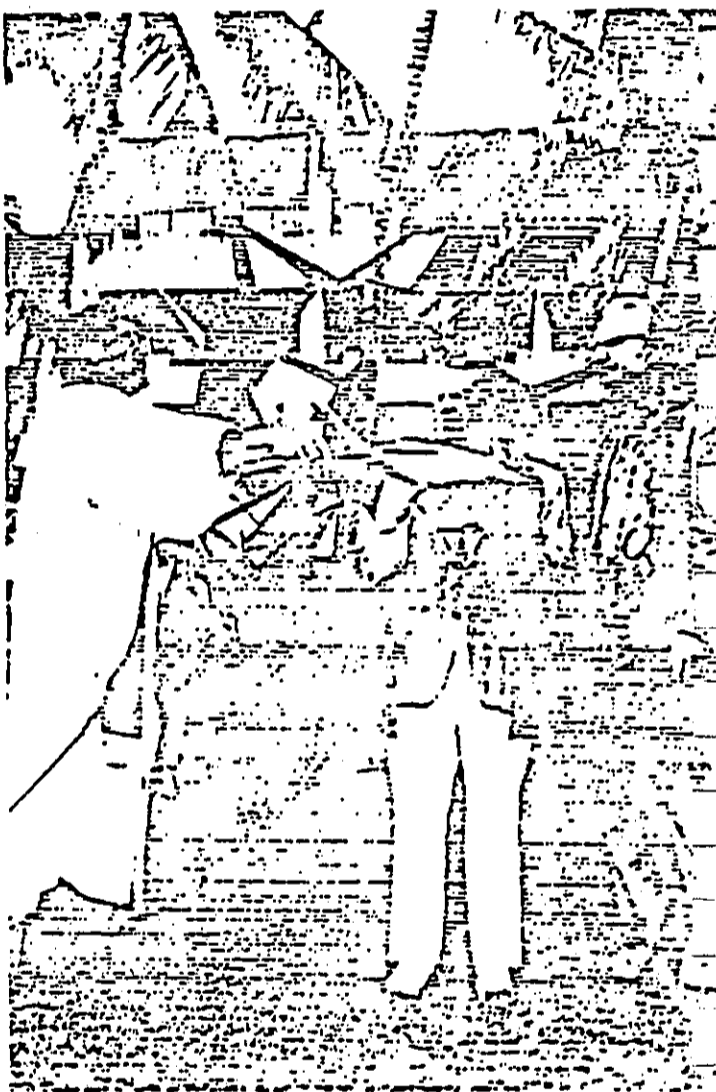
About 100 people attended the ceremonies, which were performed by Reverend Abraham Akaka, pastor of the Kawaiahao Church in Honolulu.

The 310-room Mauna Kea was sold along with 100 acres of adjacent land for \$51.5 million and will be managed by Western International Hotels, which now operates the Ilikai in Waikiki and plans to open the Wailea Beach Hotel on Maui later this year.

The Mauna Kea will keep its present staff and management, according to a spokesman for UAL, Inc.

Carlson said that UAL would "add some rooms here, but not many," at some unspecified future date. The vacant land surrounding the hotel will not be developed anytime soon, Carlson said.

new owners at Mauna Kea



MAUNA KEA BLESSING—Reverend Abraham Akaka (left) blesses the Mauna Kea Beach Hotel South Kohala after the recent change in ownership. Holding the koa bowl is Edward Carlson, chairman UAL, Inc., which bought the Mauna Kea from Laurance Rockefeller (right). WHT photo by Tim Mahoney.

commission acts on Puako resort plans

West Hawaii Today, Tuesday, March 14, 1978



By PAT GEEBERG
WHIT Staff Writer

Four of five permits that would allow the Mauna Loa Land Inc. to proceed with resort development in South Kohala have been approved by the County Planning Commission.

Mauna Loa, owned by two large Japanese corporations, plans to build a resort complex makai of the Queen Kaahumanu Highway between Puako and Honoaiape Bay, next to the resort area under development by Boise Cascade around Anahoomalu Bay.

The commission took action on all but one request—an amendment to a Planned Development Permit (PDP)—following a public hearing last Thursday night at the Waimea Civic Center.

The commission must wait a minimum of 15 days before acting on PDP applications.

About 35 persons attended the public hearing, but only five offered testimony, three of them voicing opposition to the development.

Mauna Loa first came before the Planning Commission in 1975 to get permission for the development of the first increment of the project.

Mauna Loa has since revised its applications for the entire 771-acre area and requested the following items:

—an amendment to a Special Management Area (SMA) use permit to allow the development of a resort complex, which includes 3,000 hotel rooms (for five hotels), about 3,182 multiple residential units, a golf course and clubhouse, recreational

facilities, commercial facilities, service area, sewage treatment plant, infrastructure such as roads, utilities, an irrigation well, and other related improvements;

—a change of zone for the adjustment of various existing zoning boundaries (this request also requires County Council approval);

—a Planned Unit Development (PUD) permit to allow the construction of a 350-room hotel with six stories and a height of 67 feet on 27.7 acres of land on hotel parcel 1. Also requested is the allowance of a minimum of 10 parking and loading spaces for trucks and buses;

—Partial Planned Unit Development (PPUD) permits to allow the future construction of hotels on five sites with heights of six stories or up to 75 feet, in lieu of the maximum allowable heights of three stories or 45 feet; —and an amendment to a Planned Development Permit to allow the ultimate construction of 3,000 hotel units and about 3,182 condominium apartment units.

At the hearing, Masayoshi Onodera, representing the Waimea-Kawaihae Community Association, said his group voted to give "unanimous endorsement of the petitioner's requests" at a general meeting March 8.

The association has 130 to 150 members, he said.

Tim Mc Cullough, representing farmers in the Kamuela Vacuum Cooling Co-op, said his group was in favor of the development because "it's expanded market for us."

But Mc Cullough said the co-op was afraid the

development would "cut the irrigation water short and leave the farmers dry."

"We use 25 million gallons of water per month," and the source of irrigation water is the same as that for domestic use, "the rain on Kohala Mountain," he said.

The association also has been talking with state agriculture representatives about expanding the vegetable crop in Waimea, according to Mc Cullough.

"We may need twice as much water consumption (than the 25 million gallons). All we're asking is that you plan for our expansion as well (as the resort's). We now have a 60 million gallon catchment reservoir, and this will need to be expanded," he said.

According to Jack Bridge, a Mauna Loa representative, the developer has been working with the County Board of Water Supply and the State Water and Land Development Division on the water problem. It is hoped that the water source will come from the Lalaimilo test well, he said.

Speaking against the resort complex were Glen Felton, a general contractor, Momi Urbich, a Hawaiian studies teacher, and Judy Graham.

Felton said the development will "destroy one more part of Hawaii. I want the hotels to be built further back so it doesn't preclude future generations of kids to see Hawaii like it was, not like Waikiki."

Urbich questioned the precautions Mauna Loa plans to take in order to preserve the historic sites and fish ponds.

"The preservation of historic sites is not as tasteful as I had hoped," she said. As a result of putting a road in the area, rocks have fallen into the fishponds, according to Urbich.

But Bridge said no construction has been done along the pond area or close to it. When construction begins, he said, "we will have the necessary precautions. We want to preserve the ponds as much as you do."

The road, he added, is just a jeep road that is a few years old.

Urbich also commented that the proposed development was "very touristy looking, almost a Las Vegas type" and the manmade lagoons surrounding the buildings are "almost mocking" the natural ones.

Urbich said hotels built on the a'a lava flow would be "a lot higher" than hotels not built on the flow, and consequently the allowed six-story height will be "a lot higher on one side."

In other testimony, Graham said she was "opposed to this development as I have other development along the coast."

For more about Planning Commission action, see page 35.

Mark Saito
Consulting Engineer



West Hawaii Today, Tuesday, July 5, 1977-3

16 THE WALL STREET JOURNAL
Friday, Jan. 6, 1978

Sheraton to build at Waikoloa Beach

Mark Saito
Consulting Engineer

Plans have been announced for construction of the new 310-room Sheraton Royal Waikoloa Hotel to be located at Waikoloa Beach Resort at Anaeohomalu.

The hotel will be operated by Sheraton Hawaii Management Corporation, a subsidiary of The Sheraton Corporation, according to a management contract signed with First Hawaiian Development Corporation. The Boston-based Sheraton Corporation is an international system of 305 hotels and inns in 35 countries.

The resort hotel, to be situated on 15.7 acres facing the Pacific Ocean, will overlook the beach on Anaeohomalu Bay. The New York architectural firm of Welton, Becket, and Associates are designers of the new hotel.

The structure, scheduled for groundbreaking in the late fall of 1977, is expected to be completed in mid-1979.

Featuring a Hawaiian and tropical decor, hotel amenities will include a dining room, specialty restaurant, coffee shop, cocktail lounge, meeting rooms and a ballroom

accommodating 900 persons for meetings. Other facilities will include two swimming pools, a spacious luau area, six tennis courts, a recreation area, and will be adjacent to a brand new 18-hole championship golf course to be designed by Robert Trent Jones, Jr.

The new hotel is part of the extensive Waikoloa Beach Resort, approximately six miles south of Mauna Kea Beach Hotel and 24 miles north of Kailua-Kona. It is located 20 minutes from Keahole Airport, the state's newest major air facility.

UAL Plans to Buy Hawaii Hotel, Land For \$51.5 Million

By a WALL STREET JOURNAL Staff Reporter
CHICAGO—UAL Inc. said it agreed in principle to acquire the Mauna Kea Beach Hotel on the Island of Hawaii from Laurence S. Rockefeller for \$26.7 million cash and assumption of a \$14.8 million mortgage.

Included in the proposed transaction is the 310-room hotel, an 18-hole golf course and about 100 acres adjacent to the golf course and hotel. Western International Hotels, a UAL unit, will manage the hotel and golf course. The facilities are currently managed by Rockresorts Inc., Mr. Rockefeller's resort management company. Mr. Rockefeller will retain an interest in properties surrounding the Mauna Kea resort.

Edward E. Carlson, UAL chairman, said the company hadn't any plans for future use of the undeveloped land adjacent to the hotel. Western Hotels already operate the Kai Hotel in Honolulu and this year the Wailea Beach Hotel on the island of Maui. UAL's major operating unit, United Airlines, carries about 43% of the traffic between Hawaii and the mainland.

Direct LA flights to Kona under way

KE-AHOLE—Two big United Airlines jets landed at Keahole Airport Thursday afternoon to begin a series of direct charter flights from Los Angeles which will run through the end of April.

In the past big charter flights into Kona have been only sporadic.

"It's a first for Kona," said Kona Hilton Chief Executive Serge D'Rovencourt. "For such an extensive back to back movement on a weekly basis, it's a first."

The 400 visitors the planes carried are physicians and their spouses participating in this week's seminar at the Hilton. Some 1,500 persons eventually will participate in the seminars, which began in early

November under the sponsorship of Warner Chilcott, a pharmaceutical company.

Two hundred persons have been arriving weekly for the seminars, but until Thursday the charter flights landed and departed from Hilo and the visitors were transported by bus between Hilo and Kona.

The visitors, from various locations on the Mainland, also will return to Los Angeles each week directly from Keahole, D'Rovencourt said. The first batch left Thursday. The tours are handled by Arcan Associates, a firm which specializes in setting up seminars for professional people.

NOTE ADJACENT ARTICLE: Now come the charters that proves the Keahole Airport can handle them and then the pressure will be on for schedule flights... and United has the most to gain with Troy Post of Braniff, the co-developer of the Keahou Beach area. Also, it's my understanding that Continental Airlines acquired a 6% interest in Interisland Resorts which could add to the pressure by "vested interest" airlines on Keahole. We also know that UA owns Western Hotels International which is the Rolls Royce of the hotel business. Mauna Kea fits nicely into their chain. With the "sweet smell of success" I wouldn't be surprised if Western will enlarge their Kona Coast management contracts or hotel ownerships, possibly in the Keahou Beach area. We also know that Troy Post development around the Keahou Estate. I don't know whether UA can fly in either 747's or their new DC-10's. The above charters were DC-8's—same size as the 707. We understood the DC-10 can use a much shorter runway than the L-1011. Up to now only Western was equipping for DC-10 overseas flights as a plane cost \$10 million to modify. We have also heard that UA is putting in a new fleet of "OVERSEAS" DC-10's.

Booming Big Island

It's a pleasure to note that some of Hawaii's best economic news of the year is being made on the Big Island.

The emerging picture is not exactly new in the sense that the signs of a strong recovery have been there and largely reported over recent months.

BUT THEY ARE put in promising perspective by the First Hawaiian Bank's 1978 report on the Big Island's economy. It summed the situation like this:

"After two mediocre years, the economy is benefiting from advances in all major sectors. Tourism, which is leading the advance, is finally scoring the kind of gain that had escaped the Big Island's visitor industry in recent years.

"Energy research and development, with millions of dollars in federal funds being received to boost local appropriations, has become an important sector of the economy. Diversified agriculture posted another record year. The sugar outlook appears more hopeful than last year. And construction appears to be turning the corner."

What's also notable is that in describing this "rebirth," Dr. Thomas Hitch, the bank's economist, said the glowing report was prepared several weeks before the federal government announced three large projects in ocean thermal energy conversion (OTEC) off Ke-Ahole Point in North Kona. That will mean some \$50 million more for the Big Island economy.

IT IS POSSIBLE to find some gray spots in the situation, of course.

Sugar's long-range future remains uncertain, even as Congress strengthens supports. Coffee prices are down. Transportation problems and marketing challenges play a part in the outlook for papayas. The economics of cattle production remain a problem.

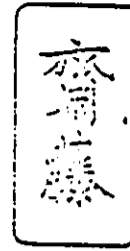
Hiten noted OTEC might not prove economically feasible. And some of the dramatic tourism growth is due to overflow from other islands.

But, all that considered, the picture for the Big Island is surprisingly — we would add delightfully — bright. It has a good mix of traditional elements such as tourism and sugar and "new stars" such as OTEC and geothermal projects which promise to make the island a laboratory for experimentation on new sources of energy.

This is not to mention the longer-range potential for using geothermal energy to provide power for a new industry — the processing of manganese and other mineral nodules mined from the seabed and brought to Hawaii.

THE BIG ISLAND'S improved economic situation has to be considered a plus for the administration of Mayor Herbert Matayoshi (who is not up for reelection this year). He has stressed tourism and energy research and development of alternate energy resources.

But more than anything the bullish situation indicates that the Big Island will be living up to more of the promise it has long held, and doing so in ways that add special dimensions to our total economic future.



Mark Saito
Consulting Engineer

State Goals for West Hawaii Hotel Rooms

By TIM MAHONEY
WHT Staff Writer



Mark Saito
Consulting Engineer

The number of hotel rooms and tourism jobs in west Hawaii would nearly triple in seven years if new State goals for tourism are fulfilled.

That message is contained in a report published recently by the State Department of Economic Planning and Development (DPED) in Honolulu.

The report sets an 8 percent per year increase in tourism as desirable for the Big Island—but since few additional hotel units are proposed for Hilo, west Hawaii could experience nearly 15 percent annual growth.

That would mean an additional 7000 hotel rooms and some 5000 visitor industry jobs on the island's west side, according to the DPED.

Currently, west Hawaii supports about 4300 hotel rooms, which account for approximately 2500 jobs.

Rooms in apartment-hotels and resort condominiums are counted as hotel rooms in all figures.

Based on an extrapolation of DPED figures, the number of hotel units state planners think will be built in west Hawaii's districts by 1985 are:

- South Kohala, 4800
- North Kona, 1700
- South Kona, none
- Ka'u, 500

The DPED's report is called "State Tourism Study" and will be submitted to the 1979 Legislature for adoption by concurrent resolution.

DPED planners made many recommendations in the report, including:

-Directing tourism growth toward the Neighbor Islands. (State-wide growth is targeted for 7 percent, but tourism expansion on Oahu is planned for a lower percentage, while Maui should grow at 10 percent and Kauai and the Big Island at 8 percent.)

--Establishing a "Hotel Quality Certification program."

This would entail the State Department of Regulatory Agencies making "an annual evaluation (of hotel facilities) which would be made available to the trade and public." Planners hope that this evaluation—in the form of a published report—would "encourage the maintenance and refurbishing of hotel properties to prevent a general decline in the visitor plant in Hawaii."

---Continuing the "promotion and marketing of Hawaii in proven primary markets."

-Allocating funds for expansion of tourist industry occupational and training programs and for "additional research and teaching personnel at the University of Hawaii's School of Travel Industry Management."

The DPED report says that the 7 percent target growth rate is "optimal" considering all the economic, social and ecological factors involved.

"At the 7 percent level," the report states, "we will be encouraging our young

people to remain in the state, keep unemployment at a moderate 6 percent, and discourage excessive growth."

Some tourism growth is desirable, according to the report, because without it Hawaii would have "a depressed economy with young people migrating out of the state to seek work."

DPED planners admit that a 7 percent growth rate for tourism will "likely induce additional in-migration (from other states) and immigration (from other countries)."

A 4 percent growth rate for the visitor industry would depress the economy enough to stabilize the population, the planners say. But since some people will move to Hawaii regardless of economic conditions, the result of such slow growth would be mass out-migration of residents and unemployment averaging 13 percent.

"If we wish to discourage in-migration and immigration," the report says, "but provide job opportunities for the people already living here, 7 percent tourism growth is the best projection."

VOLUME 1

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GENERAL CONDITIONS

1. ATTENTION GENERAL CONTRACTOR AND ALL SUBCONTRACTORS

"General Conditions of the Contract", Standard Form A-201, current edition, of American Institute of Architects, are hereby made a part of this Specification to same extent as if bound herein. General Conditions, including Supplementary General Conditions hereinafter specified, shall become a part of Contract, except as superseded by provisions of signed Agreement between Owner and Contractor, and shall apply to General Contractor and all subcontractors. Copies of General Conditions may be obtained through Designer.

SUPPLEMENTARY GENERAL CONDITIONS

1. STANDARD A.I.A. FORMS

- A. The American Institute of Architects' current edition of their Standard Form A-201 "General Conditions of the Contract for Construction" (hereinafter referred to as "General Conditions") is hereby made a part of this Contract and shall apply to all Contractors and Subcontractors.
- B. Where any article of above referenced "General Conditions" is supplemented hereby, other A.I.A. provisions of such article shall remain in effect. All supplemental provisions shall be considered as added thereto. Where any such article is amended, voided or superseded hereby, provisions of such article not specifically amended, voided or superseded shall remain in effect.
- C. The following paragraphs refer to this project and are herewith incorporated into "General Conditions" and supersede them whenever they conflict.

2. BRIEF FORM OF SPECIFICATIONS

These "Supplementary General Conditions", Specifications, and other documents are of abbreviated or "streamlined" type, and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall" (NOTE: Unless specifically noted to the contrary, all directions and instructions contained in Contract Documents are addressed to Contractor who signs Agreement with Owner), "in conformity therewith", "shall be", "as noted on the drawings", "according to the drawings", "in accordance with the specifications", "a", "an," "the", and "all", are intentional. Omitted words and phrases shall be supplied by inference in same manner as they are when a "note" occurs on drawings. This is solely for purpose of brevity, and is not intended, nor shall it be considered, as license to modify requirements thereof; therefore, all parties shall interpret provisions and requirements of specifications as mandatory, unless otherwise expressly and specifically stipulated.

3. ORGANIZATION OF SPECIFICATIONS AND ARRANGEMENT OF DRAWINGS

Add following to sub-paragraph 1.2.4 of General Conditions:

"1.2.4.1 Said organization of specifications and arrangement of drawings has been made for convenience only. Neither Designer nor Owner are bound thereby to define limits of any subcontracts or

establish work to be performed by any trade, craft or union. Except as otherwise expressly provided herein, terms and conditions of such limitations are wholly between Contractor and his subcontractors. Each subcontractor shall examine all specification sections and drawings to ascertain provisions and requirements therein, and thereon, affecting his work."

4. EXECUTION, CORRELATION, INTENT, AND INTERPRETATIONS

Add following to paragraph 1.2 of "General Conditions".

"1.2.6. Execute work per Contract Documents. Make no changes therefrom without having first received written permission. Where detailed information is lacking, before proceeding with work, refer matter to Designer for information.

1.2.7. In general, drawings indicate dimensions, positions and details of construction; specifications describe qualities of materials, construction methods, and workmanship. All work described in specifications or shown on drawings and all work dependent upon or necessary to complete finish of work so described or shown shall be executed in workmanlike manner and shall be of materials best adapted to purpose where such work or materials are not specifically indicated or noted.

1.2.8. In case of difference between specifications and drawings with reference to size, shape or dimension, and where there are typographical errors in specifications or notational errors on drawings, Designer will decide upon correct intent. Should an error appear in specifications or drawings, or in work done by others, affecting this work, notify Designer at once for instructions as to procedure. If Contractor proceeds with work so affected without instructions from Designer, Contractor shall make good any resulting damage or defects.

1.2.9. General character of detail work is shown on the Contract drawings but minor modifications may be made in large scale and full size details. Designer may furnish miscellaneous details, large scale and full size details to more fully explain the work.

1.2.9.1. Such details shall be considered a part of Contract. Work executed before receipt of such details, if not in accord therewith, shall be removed and replaced or adjusted as directed at Contractor's expense. Should, in Contractor's opinion, such details be more elaborate than scale drawings and specifications indicate, written notice shall be given to Designer within 5 days of receipt thereof. Claim will be considered and, if justified, details will be amended, or extra work authorized. Non-receipt of such notice shall relieve Owner from claim for additional cost resulting therefrom.

1.2.11. Should conflict occur in or between Drawings and Specifications or where detail references on Contract Drawings have been omitted, Contractor is deemed to have estimated on best practice of the trade involved unless he shall have asked for an obtained written decision from Designer before signing the Agreement (or Form of Contract) as to which method or materials will be required."

5. COPIES (OF DRAWINGS AND SPECIFICATIONS) FURNISHED

Change subparagraph 1.3.1 of A.I.A. "General Conditions" to read solely as follows:

"1.3.1. Ten copies of Contract Documents will be issued to General Contractor. Additional copies of any of the Contract Documents will be furnished to General Contractor (only) for cost of reproduction."

6. DESIGNER

Add following to sub-subparagraph 2.2.7:

"2.2.7.1. Designer will decide all questions as to intent and meaning of Drawings, Specifications, and related documents, including all questions as to errors, conflicts, ambiguities, or omissions and all questions as to sufficiency of performance of work. Owner and Contractor shall concede and agree to such jurisdiction of Designer. Designer is also conceded authority to stop work whenever such action is necessary to secure fulfillment of Contract requirements."

7. SURVEYS, PERMITS, LICENSES, LAWS, AND REGULATIONS

Articles 3 and 4 of "General Conditions" are herewith supplemented as follows:

"3.2.2.1. Owner's Responsibilities: Owner will secure and pay for plan checking fees required by governing building department.

4.7.3 Contractor's Responsibilities:

4.7.3.1. With exceptions noted in sub-subparagraph 3.2.2.1, secure and pay for all permits including building permit) and licenses necessary for prosecution of work, including highway fees, all temporary fees necessary to prosecute work, and all certificates of inspection and occupancy required by authorities having jurisdiction.

4.7.3.2. Send notices, make all necessary arrangements, and perform all services required in care and maintenance of all public utilities. During construction period and until final acceptance of work by Owner, assume all responsibility concerning same on work involved in execution of this contract for which Owner may be liable.

4.7.3.3 Contractor shall obtain and pay for permits and inspections made necessary by the use or opening of public streets, sidewalks, curbs and paving; shall post guarantees and bonds that may be required in connection therewith, and shall be responsible for the repair and making good of damages thereto to the satisfaction of the authorities having jurisdiction, on work involved in the execution of this contract.

4.7.3.4. Before commencing work verify all grades, lines, levels, and dimensions indicated, and report errors or inconsistencies to Designer. Do not proceed until errors and inconsistencies are corrected.

4.7.3.5. Establish and maintain all building and construction grades, lines, levels and bench marks and be responsible for accuracy and protection of same.

4.7.3.6. Protect all bench marks and maintain them in place for duration of the Contract or until such time as their removal is authorized by Designer.

4.7.3.7. Do not remove property line markers or monuments or data established by Owner."

8. CONTRACTOR'S COORDINATION OF SUBCONTRACTORS' WORK

Add following to paragraph 4.10 of General Conditions:

"4.10.2. Contractor shall be responsible for coordinating the work of all subcontractors and trades so that the work as a whole will conform to approved construction schedule and contract completion date and so that work will be completed efficiently and expeditiously per Contract Documents. This coordination includes, but is not limited to such items as:

- (1) Coordinate the work of the various crafts to avoid possible interferences, duplication of work, or unfinished gaps between operations.
- (2) Advising subcontractors and trades as to features of construction required in their work to receive, engage and support various parts of other work, and of easements and tolerances required. It is Contractor's responsibility that each subcontractor leave his work in proper condition to receive subsequent application of work of other trades.
- (3) Contractor and each of his subcontractors shall be responsible for examining all drawings, all sections of specifications and

all items of addenda to fully inform themselves of requirements for their part of the work. Designer and Owner assume no responsibility for omission of an indication of an item or part of work from a location on one drawing which is indicated in same relative location on another drawing. Requirements indicated on any drawing shall constitute requirement of trade having jurisdiction unless specifically noted to contrary or understood otherwise between Contractor and subcontractor. Specifications are divided into sections for convenience of Contractor. Item or parts of work specified shall constitute a responsibility of Contractor regardless of where they are located in specifications. Neither Designer nor Owner will make decisions on trade jurisdiction nor responsibilities of subcontractors.

- (4) Contractor shall also advise various trades, and they shall agree that due to field conditions minor departures from drawings will occur, and work involved in such departures shall be performed without additional compensation. No claims for extras will be allowed in connection with such minor changes due solely to field conditions.
- (5) Supervise taking of all measurements in field necessary to insure timely fabrication, delivery, and proper fitting together of entire work.
- (6) Prepare and protect work as required for introduction into building of materials, fabrications, furniture, and equipment furnished by Owner and not a part of this Contract. Render assistance as required to facilitate installation of such items.
- (7) See that provision for and placement of all work by applicable trade or subcontractor is accomplished on schedule.
- (8) See that all sleeves, inserts, boxes, piping, conduit, blocking, anchor bolts, and other required items are built into work at proper time in required manner.
- (9) See that applicable trade and/or subcontractor furnishes and/or receives all drawings, templates and other information required for work as a whole.
- (10) Regulate and schedule installation and/or erection of each trade and craft involved in work in such manner as to avoid delays due to overlapping in time of starting work of various trades or

lack or erection or installation of contiguous or underlying work upon which installation or erection or work of any trade is dependent."

9. CUTTING AND PATCHING

Add following paragraphs to "General Conditions" paragraph 4.15:

"4.15.2. Contractor and subcontractors shall cooperate fully in performance of work. Cutting of new work shall be avoided. However, if cutting, patching, repairing, removal and/or replacing is necessary, it shall be performed per requirements of Contract Documents.

4.15.3. In all cases, care shall be exercised in cutting operations. Perform such operations under adequate supervision by competent mechanics skilled in applicable trade. Neatly cut openings as small as possible to avoid unnecessary damage. Careless or avoidable cutting will not be tolerated, and Contractor will be held responsible for such avoidable damage.

4.15.4. All patching, repairing and replacing of materials and surfaces cut or damaged in execution of work shall be done with applicable materials, in such a manner that all surfaces so replaced, etc., will, upon completion, match surrounding similar surfaces.

4.15.5. All replacing, patching and repairing of all materials and surfaces cut or damaged shall be performed by methods and with materials so as not to void, in any way, guarantees and/or bonds required under this Contract or in force on existing work or work performed under other contracts. Specific attention is called to such items as roofing guarantee and bond."

10. CLEANING

Add following subparagraphs to paragraph 4.16 "General Conditions":

"4.16.3. During construction period, materials to be used shall be kept in an orderly manner, neatly stacked or piled. Upon completion of work of any trade, remove surplus materials and scrap from job-site.

4.16.4. Perform "clean up" work after painting has been completed and just prior to final acceptance of work as a whole by Owner.

4.16.5. With exceptions specified, use materials and methods for cleaning and polishing as recommended by the applicable manufacturers.

Soaps and cleaners shall be of types not injurious to surfaces on which they are used. Use of acids is prohibited except as set forth in specifications.

4.16.6. All work shall be left clean of dirt, splatterings of paint, plaster and foreign matter. Contractor shall leave buildings and premises in clean and orderly manner, ready for occupancy for which it is intended and in accordance with following "Check List", in addition to "broom-cleaning".

- a. Remove putty and all other stains from glass, wash and polish same, inside and outside. Exercise care not to scratch glass, putty, and glazing compound.
- b. Remove marks, stains, fingerprints, dirt, and other foreign material from painted, decorated, stained, and other finished work.
- c. Clean and polish hardware. This includes removal of stains, dust, dirt, paint, plaster, and concrete.
- d. Remove spots, soil, paint and other foreign matter from finished surfaces, tile, and similar work.
- e. Clean fixtures and equipment, remove stains, paint, dirt, dust, and other foreign matter therefrom.
- f. Clean exterior and interior metal surfaces (including doors, and windows) of oil, stains, dust, dirt, paint, plaster, concrete. Polish and leave without fingermarks or other blemishes.
- g. Remove all temporary protections from site."

11. SCHEDULE OF VALUES

Delete last sentence of subparagraph 9.2.1 in its entirety and add following sub-subparagraph thereto:

"9.2.1.1. Combine this schedule with the progress schedule required by subparagraph 4.11.1. After these combined schedules have been approved by Designer, it will be used as a basis for Contractor's Applications for Payment and Designer's approval of same.

9.2.1.2. This schedule shall be made in the form of a progress chart and shall be subject to Designer's approval. Contractor shall enter on chart, actual progress once a month or at such intervals as directed by Designer, and shall immediately deliver two copies of chart to Designer

9.2.1.3. Schedule and cost breakdown shall conform to their true value as listed in detailed estimate."

12. CONTRACTORS LIABILITY INSURANCE

Delete paragraph 11.1, Contractor's Liability Insurance, in its entirety.

Delete paragraph 11.2, Owner's Liability Insurance, in its entirety.

Delete paragraph 11.3, Property Insurance, subparagraphs 11.3.1 and 11.3.3 through 11.3.8. Subparagraph 11.3.2 shall remain in effect, stating:

"The Owner shall purchase and maintain such steam boiler and machinery insurance as may be required by the Contract Documents or by law. This insurance shall include the interests of the Owner, the Contractor, Subcontractors, and Sub-subcontractors in the Work."

Paragraph 11.3, Loss of Use Insurance, shall remain in effect.

The following Article XIII, Insurance is quoted from the Owner/ Contractor Agreement.

ARTICLE XIII - INSURANCE

1. Owner at Owner's expense and from reputable insurance companies, shall procure for itself, Contractor and each subcontractor performing labor at the site, the following forms of insurance:

- (a) All-Risk Installation Floater Insurance on any and all materials, supplies, equipment and machinery of any nature whatsoever to be used in or incident to the performance of the work hereunder, while in transit, while awaiting erection, during erection and until accepted by Owner; excluding, however, Contractor's equipment (whether rented or owned), mechanics' tools and mechanics' equipment.
- (b) Workmen's Compensation and Employer's Liability Insurance covering each and every workman employed at the site in the performance of this contract, as provided for in each and every Statute applicable to Workmen's Compensation and Employer's Liability.

(c) Comprehensive Liability Insurance covering operations at or about the site of the work (excluding Automobile Insurance) with the following limits of liability:

Bodily Injury Liability	\$2,000,000 each occurrence
Personal Injury Liability	2,000,000 aggregate Products or Completed Operations.
Property Damage Liability	\$2,000,000 aggregate Operational 2,000,000 aggregate Contractual 2,000,000 aggregate Protective 2,000,000 aggregate Elevator

Such insurance as respects each subcontractor individually shall terminate on completion of the work by such subcontractor, except that completed operations insurance shall continue up to but not further than the date of completion and acceptance by the Owner of the particular structure or facilities upon which such subcontractor performed the work. Bids received from each subcontractor performing labor at the site shall not include insurance costs for those coverages listed in this paragraph.

2. All dividends, rebates or refunds payable under any and all such policies shall belong to Owner and are hereby assigned to Owner, and Contractor at the request of Owner will execute and deliver to Owner any release, assignment, direction or authorization which any insurance company may require for such purpose.

3. Prior to commencement of any work by Contractor, or subcontractor, he shall procure and maintain during the term of this construction Contract, and pay premiums for the following insurance:

Comprehensive Automobile Bodily Injury and Property Damage Insurance with limits of (1) \$100,000 per person and subject to that limit, \$300,000 per accident for Bodily Injuries; and (2) \$100,000 per accident for damage to or destruction of property. This insurance shall cover all vehicles, whether rented or owned, while being used in connection with performance of the work.

4. Any other insurance not described above which Contractor or subcontractor desires for his own protection shall be his own responsibility and at his sole expense.

5. All supply contractors and all other contractors excluded from Owner's insurance coverage, paragraph 1 of this Article XIII, shall during the progress of the work, maintain: (a) Workmen's Compensation Insurance in accordance with the laws of the State in which the work is being done, (b) adequate Public Liability and Property Damage Insurance, and (c) adequate Automobile Liability and Property Damage Insurance.

13. CHANGES IN THE WORK

Add following to paragraph 12.1 of "General Conditions":

"12.1.1.1. Owner reserves the right to order such changes in the work without invalidating the contract and without notice to the sureties of bonds guaranteeing the performance of the Contract.

12.1.2.1. Any claim for extension of time caused by such changes in the work shall be adjusted at the time of ordering such changes."

- END -

SECTION 1A

PROJECT GENERAL REQUIREMENTS

1A-01 GENERAL

- A. "General Conditions" and "Supplementary General Conditions" are hereby made a part of this Division and apply to all other Specification Division and Sections.
- B. These Project General Requirements refer especially to this project. Where any article of "General Conditions" or "Supplementary General Conditions" is supplemented herein, other provisions of such article shall remain in effect. All supplemental provisions shall be considered as added thereto. Where the following provisions conflict with said documents, provisions herein shall supersede applicable article.

1A-02 DEFINITIONS

Where following words and phrases are used in Contract Documents intention and meaning shall be as defined hereunder:

- A. Laws, ordinances, codes, rules and regulations of place of building shall govern construction of this Contract. Most strict of such laws, ordinances, etc., shall govern.
- B. Words "approved", "directed", "proper", "suitable", "satisfactory", "equal", "necessary", and other words of similar meaning and intent, implying exercise of judgment refer to decision of Designer, which must be obtained in writing, prior to incorporating applicable item, material, or piece of equipment into work.
- C. Terms "selected," "as selected," or other terms of similar meaning and intent, shall mean selected by Designer from referenced manufacturer and quality within price range established in Contract Documents.
- D. "Jobsite" means site of work under this Contract.
- E. References to Standard Specifications shall mean and intend latest edition, including all revisions thereto, of such Specifications in effect at date of invitation to

submit "Form of Proposal," with exceptions specifically required by governing codes, laws, ordinances in effect at jobsite.

- F. Reference to technical society, organization or body is made in Specifications per following abbreviations:

AASHO	American Society of State Highway Officials
AIA	American Institute of Architects
ACI	American Concrete Institute
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
USAS	United States of America Standards (National Bureau of Standards)
ASTM	American Society for Testing Materials
AWSC	American Welding Society Code
CRSI	Concrete Reinforcing Steel Institute
FS	Federal Specifications
NFPA	National Fire Protection Association
NBS	Nation Fire Protection Association
NEC	National Electric Code
SPR	Simplified Practice Recommendation
UL	Underwriters' Laboratories, Inc.

- G. "Provide" means "furnish and install."
- H. "Herein" means contents of the particular Specification section in which the word appears.
- I. "Section" refers to section of Specifications in which the word appears, unless specifically stated to contrary.
- J. "Indicated" means "as shown on the Contract Drawings."
- K. "Required" means "as required by the Contract Documents," unless otherwise stipulated.
- L. "Per" means "in strict accordance with."
- M. "Building Code" means current edition, as amended, of Building Code in force under this Contract. A copy of the "Code" shall be kept on hand at the job office by the Contractor.

1A-03

WORKMANSHIP

- A. Where not more specifically described, workmanship shall conform to best standards and accepted practices of trade,

or trades, involved; and shall include all items of fabrication, construction and installation regularly furnished or required for completion (including any finish required for successful operation as intended). Standard for work required throughout shall be of such grade as will result in first-class work only.

- B. Work shall be executed by mechanics skilled in their respective lines of work. Labor shall be performed in best, most workmanlike manner.
- C. When completed, all parts shall have been durably and substantially built and shall present neat, workmanlike appearance.

1A-04

MATERIALS

- A. When requested by Designer, Contractor shall deliver to Designer, prior to final acceptance (by Owner) of the work as a whole, signed certificates or other satisfactory evidence, from suppliers of materials and manufactured items stating that such items conform to Contract requirements.
- B. It shall be the duty of Contractor to keep Designer informed as to availability of all required materials, work, fabrications and equipment and advise him promptly, in writing of such materials, work, fabrication and equipment, which may not be available.

1A-05

REJECTED MATERIALS AND WORK

- A. Immediately remove any and all rejected materials. Neglect or failure by Designer to condemn or reject inferior materials or work, shall not be construed to imply acceptance thereof.

1A-06

MEASUREMENTS, QUANTITIES, ETC.

- A. Before ordering any material or doing any work, take measurements at site and check same with Drawings and with General Contractors developed layout, as necessary for accurately fitting or placing materials and equipment.
- B. Wherever quantities are specified or indicated or when any information is given in the Specifications or Drawings as to existing elevations of ground and floors,

such information shall be regarded as approximate, and bidders are required to check such information and be responsible for correctness of data used by them in estimating quantities.

- C. Whenever in these Specifications an article, device or piece of equipment is referred to in singular number such reference shall apply to as many such articles as are shown on drawings and/or required to complete work.
- D. Drawings and diagrams for mechanical and electrical work shall be followed only for work for which they were especially prepared and shall be considered as diagrammatic only; they shall not be used for any structural guidance nor for architectural layout.

LA-07

SUBSTITUTION OF MATERIALS AND EQUIPMENT ("OR EQUAL" CLAUSE)

- A. Contractor's proposal or proposals shall be based on the use of materials required by Drawings and Specifications, and revisions and addenda thereto. No other materials will be accepted during construction, except as stated herein. These requirements shall not be construed as limiting competition; they are used to establish and control type, quality, size, dimensions, gauge, weight, capacity and performances desired by Owner and Designer
- B. The Base Bid and Alternate Bids (if listed on "Form of Proposal") shall be based on the bidder furnishing material and equipment specified or indicated by proprietary name of manufacturer.
- C. All materials and equipment specified or indicated by proprietary name of manufacturer shall be deemed to be followed by the words "or approved equal" and Contractor may, unless otherwise stated, offer any material, process, or article which shall be substantially equal or better in every respect to that so indicated or specified. If material, process, or article offered by Contractor is not, in opinion of Designer, substantially equal or better in every respect to that specified, then Contractor shall furnish material, process or article specified.

Burden of proof as to equality of any material, process, or article rests with Contractor. Submit request together with substantiating data for substitution of an "or equal" item within thirty-five (35) days after award of contract. Provision authorizing submission of "or equal" justification data shall not in any way authorize an extension of time for performance of this contract.

- D. If Contractor does not request approval of such substitutions within the time limit, then he shall furnish specified or indicated materials, process, or article.
- E. Acceptance of each "equal" product is entirely at discretion of Designer and Owner, and subject to following qualifications:
1. Equal In Quality of materials used, in structural strength and in details of construction.
 2. Equal In Performance, mechanically and technically.
 3. Equal In Finish, or in characteristics permitting specified finish to be applied.
 4. Equal In Arrangement Of Plan: If substitutions for specified products require rearrangement of partitions, openings for pipe work or ducts, intakes, or exhausts, such arrangement must, in opinion of Designer, be equal in convenience and practicability to original arrangement. If such arrangement is approved by Designer and involves additional cost, such additional cost must be borne by Contractor.
 5. Equal In Price: If approval is requested for materials or equipment materially cheaper than specified products, Designer may, at his discretion, prefer specified products or require credit for cost difference be issued Owner.
 6. Repair and Maintenance: A most important condition in determining equality of substitute materials and equipment is availability of replacement parts and maintenance service. An inequality in this condition as between proposed substitutions and specified products may be determining factor in whether or not an approval is granted.
 7. Submit all Drawings, Specifications, test records, where and how long proposed material or equipment has been satisfactorily installed, and all other information required by Designer to enable him to evaluate proposed substitution. If requested by Designer, have tests made by an approved independent testing laboratory. All costs for such information, drawings, and tests shall be borne by Contractor at no increase in contract price.

- F. Pre-Bid Approval of Substitutions, is not required; however, it is Contractor's responsibility to furnish materials, equipment, products, services, construction methods, and installations complying, in Designer's opinion, with requirements of Contract Documents
- G. Where several materials, for one use, are specified by trade name, select for use any of those specified. Notify Designer in writing, within 30 days after Contract is signed, as to which item, selected, will be used.
- H. Specified materials, work, fabrication and equipment which have become obsolete at the time of submission of bids by reason of cessation of manufacture, or from any cause, or is otherwise unavailable for use under this Contract shall be brought to attention of Designer for approved substitution before submission of bids.
- J. Where material is specified by capacity or performance, then submit satisfactory proof that equipment, articles or materials Contractor proposes to use meets minimum capacities and performance requirements indicated or specified.
- K. If requested by Designer prepare and submit, for Designer's approval, complete lists of all materials, work fabrications and equipment, which are specified solely by reference to standard Specifications, which he proposes to incorporate in work. Such lists shall be in triplicate and shall include name and address of vendor, manufacturer and/or producer, trade or brand name of each material so listed. Only materials, work, fabrications and equipment which are approved in writing by Designer shall be used.
- L. Designer's acceptance of a proffered substitution does not relieve Contractor of responsibility to make, at his own expense, necessary changes to adapt item to work, including but not limited to, changes required due to dimensional, service, or access differences between substituted item and adjoining or abutting work.
- M. If Contractor offers "or equal" material and equipment for approval, any approval by Designer and/or Owner shall not relieve Contractor of assuming any added cost of consequential changes in construction, design or engineering work caused by acceptance of "or equal" item of material or equipment.

- N. Designer's approval of substitutions shall not be held to have relieved Contractor of responsibility for proper joining of other parts of the work, nor from guarantees and maintenance provisions required for materials and equipment as originally specified, and other materials or applications affected by said substitutions.
- O. Installation of approved substitutions (material, and equipment), may require changes in details to adjoin and abut other required materials or equipment used in the work. Such changes are Contractor's sole responsibility (subject to Designer's approval prior to installation of same) and shall be made at Contractor's expense. Such changes shall result in type and quality of installation originally intended and shall be clearly shown (and brought to Designer's attention, in writing) on Shop Drawings submitted for Designer's approval.

1A-08

DELIVERY AND STORAGE OF MATERIALS

- A. Deliver manufactured materials in original packages, containers or bundles (with seals unbroken) bearing manufacturers identification, wherever practicable.
- B. Deliver fabricated items in as large assemblies as practicable, and where specified to be shop-primed or shop-finished, package or crate as required to preserve such priming or finish intact and free from abrasion or other damage, wherever practicable.
- C. Store all materials as necessary to protect same from damage; materials or equipment damaged by handling, weather, dirt, or from any other cause will not be acceptable.

1A-09

REQUIREMENTS FOR MANUFACTURER'S SPECIFICATIONS, ETC.

- A. All manufactured articles, material, and equipment shall be stored, applied, installed, connected, erected, used, cleaned, adjusted, conditioned, and protected, per manufacturer's current written recommendations, specifications and instructions, unless specified or indicated otherwise.
- B. When requested, furnish Designer three original copies of each manufacturer's or association's specifications, instructions and directions referenced in Specifications. Keep copies of said specifications, instructions and directions on job site and available to Designer and Owner.

1A-10 REFERENCED STANDARDS & SPECIFICATIONS

Materials specified by title, symbol or number of Commercial Standard, Federal Specification, or other standards refer to the current issues of same, except as indicated otherwise, if not in contradiction to Building Code or Codes of other governmental agencies as may have jurisdiction. Such referenced documents shall be as considered as an integral part of the specification as if repeated word for word. Upon request, Designer will furnish source for securing copies of same. Keep copy of these documents at job site.

1A-11 CONSTRUCTION FORCE

Each subcontract is an integral part of the general contract and Contractor shall provide and maintain, in full operation at all times a sufficient crew of laborers, mechanics and foremen to prosecute work with dispatch.

- A. Prepare weekly reports showing number of workmen, by trades, actually employed on project. Deliver reports to Designer as directed.

1A-12 PUBLIC UTILITIES

- A. Send notices, make all necessary arrangements and perform all other services required in care and maintenance of all public utilities. Assume responsibility for which Owner may be liable. Provide enclosing or boxing in, removal or relocations as necessary for protection of public utilities equipment. Upon completion of work involved in execution of the contract, remove all enclosures, fill in all openings and concrete, grout same watertight, and leave in finished condition.

1A-13 MAINTENANCE OF EXISTING PROPERTY

Unless otherwise indicated or specified, or unless otherwise called for by applicable Owner, all water, gas, irrigation lines, lighting, power and telephone conduits and wires, sewer lines, structure ("house") connections in place, and other surface or subsurface structures and lines, shall be maintained by Contractor and shall not be disturbed, disconnected or damaged by him during progress of work; provided that should Contractor in performance of work disturb, disconnect or damage any of above, all expenses of whatever nature arising from such disturbance or in replacing or repair thereof shall be borne by Contractor.

1A-14 USE AND OCCUPANCY PRIOR TO COMPLETION

Owner reserves the right to use and occupy the whole or any part of these improvements which have been completed sufficiently to permit such use and occupancy without delaying Contractor's work therein. Such use and occupancy by Owner shall not, however, be construed as an acceptance of work or any part thereof, and any claim which Owner may have against Contractor shall not be deemed to have been waived by such occupancy. If such prior use increases cost of work or delays its completion, Contractor shall be entitled to extra compensation, or extension of time, or both, but such claims for extra compensation must be in writing and must be substantiated with receipted vouchers and other supporting data.

1A-15 INVESTIGATION AND PREPARATION OF BUILDING SURFACES TO RECEIVE WORK OF SUBTRADES

Prior to commencement of work to be applied to previously erected construction, make thorough and complete investigation of recipient surfaces to determine their suitability to receive required additional constructions and finishes. Make whatever repairs and conditioning required to prepare surfaces to receive additional work. Coordinate work to provide suitable surfaces to receive following work. Commencing work indicates acceptance of conditions and surfaces as being satisfactory to receive following work.

1A-16 CHASES AND OPENINGS AND SETTING OF SLEEVES, INSERTS, ETC., FOR OTHER CONTRACTORS

Provide all chases or openings shown on drawings, required by other Contractors employed by Owner. It shall, however, be duty and responsibility of Contractor involved to clearly locate at proper time, all chases, or openings required and furnish drawings, templates, and all other information necessary for proper execution of work and to furnish and install all supporting devices and materials or equipment required by him.

1A-17 NOTICE OF LABOR DISPUTES

Whenever an actual or potential labor dispute is delaying or threatens to delay performance of work, immediately notify Owner and Designer orally, and confirm in writing. Such notice shall include all relevant information concerning dispute and its background.

1A-18

AS-BUILT (RECORD) DRAWINGS

- A. Provide and maintain at job site (in Designer's or Owner's Field Office, if so directed), one complete set of white background prints of all underground utilities, mechanical and electrical drawings, and other systems requiring concealed piping, or conduit, which form a part of Contract. Prints for this purpose may be obtained from Designer at cost.
- B. Immediately after such work is installed, carefully draw on these prints, in record black or red ink, any and all work which is installed at variance with work as indicated on drawings, and indicate by measured dimension to building corners or other permanent monuments, exact location of all utility distribution (as defined above) concealed in concrete slabs and underground.
- C. Such drawings shall be made to scale and shall include exact location of valves, pull boxes, and similar items.
- D. These drawings shall be supplemented by detailed sketches as necessary, or directed, to indicate fully the work "as-built".
- E. If, in Designer's opinion, indications or details are not satisfactory or legible for purpose, Contractor shall employ competent draftsman to make new drawings to accomplish desired result.
- F. Upon completion of work, obtain a set of reproducible ozalid prints from Designer at cost. All changes from drawings shall be drawn in clear and legible, to Designer's satisfaction.
- G. These ozalids shall be turned over to Designer for his records just prior to final acceptance of project by Owner. If requested by Designer, Contractor shall show evidence that "As-Built Record" drawings are marked and dimensional to date with progress of work before Designer will approve Contractor's periodic payment requests.

1A-19

GUARANTEES

- A. As a condition precedent to certifying final payment under this Contract, Contractor shall guarantee in writing to Owner that he will repair and/or replace any or all work, together with any other work which may be displaced, damaged or marred in so doing, that may prove defective or

fail to conform to Contract provisions and requirements, workmanship and/or materials; all without any additional expense whatsoever to Owner, ordinary wear and tear and unusual abuse or neglect excepted. All guarantees, unless otherwise stipulated in Contract Documents, shall be for period of one year, dated from date of final acceptance of job as a whole by Owner.

- B. All guarantees shall be made on forms approved by Owner, or shall conform to following:

"Guarantee _____

Project: _____

Address: _____

Date: _____

We hereby guarantee the _____
which we have installed in the project for a period of _____
(year) (years) in accordance with the requirements
of the Contract Documents. We agree to repair and re-
place any or all such work, together with any other work
which may be displaced or marred in so doing, that may
prove defective in workmanship, materials or failure to
conform to Contract provisions and requirements with the
above noted period (from date of final acceptance of the
job as a whole) without expense whatsoever to the Owner,
ordinary wear and tear and unusual abuse and neglect ex-
cepted.

Signature of General Contractor

Signature of Subcontractor

Address

Address

Date

Date

St. Francis Hotel Addition

1A-20

PREREQUISITES TO FINAL PAYMENT (ALSO SEE ARTICLE 9 OF "GENERAL CONDITIONS")

Fulfill following requirements of Contract Documents before final payment will be authorized:

- A. Satisfactory completion of construction work and acceptance by Designer and Owner.
- B. Submission to Designer of required written guarantees.
- C. Submission to Designer of "As-built" drawings, completely recorder and signed.
- D. Provide Owner with Satisfactory "Mechanics Lien Guarantee."
- E. Provide Owner with complete file of Operation and Maintenance Manuals of equipment and materials used in work.
- F. Submission, by Contractor to Owner, of an affidavit, sworn to before a Notary Public, stating that all workmen and persons employed, all firms supplying the materials, and all subcontractors upon the project have been paid in full, and that there are no bills outstanding against the project for either labor or materials, except certain items, if any, to be set forth in such affidavit covering disputed claims or items in connection with which Notices to Withhold have been filed under provisions of Statutes of State of California.

1A-21

FINAL ADJUSTMENT AND COMPLETION (ALSO SEE ARTICLE 9 OF "GENERAL CONDITIONS")

- A. Contractor shall give written notice of completion of work under this Contract to Owner and Designer in which he shall request final inspection and certify that he has made a thorough survey of the project, and has ascertained that all work has been completed per approved drawings, specifications, addenda, change orders, and all other Contract Documents.
- B. Contractor, prior to issuance of Notice of Completion of the work under the Contract, shall make thorough survey of work of all trades and ascertain that all final adjustments have been properly made. Adjust and balance all systems, adjust all valves; check all fluid and gas carrying pipe lines, roofs, flashings, gutters and downspouts for leaks; lubricate all moving parts of

machinery and equipment; check all windows, doors, drawers and hardware for proper operation; mount on wall or deliver to Designer. (as required), all printed, drawn or written operating and maintenance instructions, catalogs and instruction books covering care and maintenance of equipment; instruct Owner's maintenance personnel on use and care of equipment.

- C. Replace with new glass, without additional cost to the Owner, regardless of time or cause, all glass which has been scratched, damaged or broken before final acceptance of buildings by Owner.

1A-22

PROTECTION OF WORK AND PROPERTY

- A. Provide and maintain fences and other structures as required by law so as not to obstruct or interfere with traffic in public streets, alley-ways or private right-of-ways; leave an unobstructed way along public and private place for pedestrians, and vehicles, leave access to hydrants; provide walks over and around any obstructions made in a public place in carrying on the Contract. Keep all roadways and sidewalks in proper conditions until termination of contract.
- B. Protect excavations, building, property of Owner and others, from damage from rainwater, ground water, backing up of drains or sewers, other water. Provide drainage pumps, equipment, enclosures and other items necessary to provide this protection.
- C. Provide constant protection against rain, wind, storms, frost, cold or heat so as to maintain work, materials, apparatus, fixtures, and similar items involved in the work free from injury or damage. At end of day's work, cover work as necessary to adequately protect same.
- D. Shoring, Bracing, Etc.: Provide all shoring, bracing and sheeting required for safety and for proper execution of work. Remove when work is completed. Provide and maintain temporary bracing to prevent damage to project or its component parts.
- E. In relation to execution of this contract, General Contractor shall be responsible for existing structures and improvements, both above and underground, including finishes (both exterior and interior) within and adjoining working area, and shall provide adequate protection therefor, either by barricades, covering or by temporary removal.

Any existing structures or improvements damaged during construction shall be repaired or replaced with materials, workmanship, fixtures or equipment of the same kind, quality and size as required by drawings and specifications. Any materials or equipment temporarily removed and damaged shall be re-erected and/or installed in an approved manner.

- F. When proper completion of work required temporary or permanent removal, Contractor shall, at his own expense, remove and without unreasonable delay, temporarily or permanently replace or relocate all water pipe, pipelines, conduits, culverts, roads, driveways, fences, wires, poles, retaining walls, curbs, gutters, cement walks and all other improvements of whatever character, not required by law to be removed by Owner thereof, and all such improvements temporarily removed shall be maintained until permanently replaced, all at Contractor's expense.
- G. Protect all finished work (doors, windows, floors, equipment), from damage.
- H. It shall be understood that any partial payment made under this Contract will not relieve Contractor from any of these provisions and requirements for protection.
- J. Damage: Remove work damaged by failure to provide protection; replace with new work without cost to Owner.

1A-23

COLOR SCHEDULE

After awarding Contract, General Contractor shall obtain from his subcontractors and submit to Designer, complete list of all materials for which colors are to be selected and which they/he proposes to use, including manufacturer's name and all other pertinent data which will facilitate completion of color selections for Designer's "Color Schedule". Designer will not prepare Color Schedule until submittals and required samples have been submitted to and approved by Designer.

1A-24

DUST CONTROL

Control all dust in working area and involved portions of site including access roads or drives. Satisfactorily allay dust.

1A-25

SPECIFICATIONS

- A. Specifications and other contract documents which are a part of Contract Documents are as listed in specifications "Index."
- B. Work shall conform to all requirements of specifications and other documents, and to all addenda and other written instructions which may be subsequently issued by Designer to supplement, modify, or interpret same.

1A-26

CONTRACT DRAWINGS

- A. All drawings for work in this Contract, shall be as listed on drawing Sheet No. 1.0, dated February 16, 1970.
- B. Work shall conform to all requirements of drawings, and requirements of supplemental detail drawings as may be subsequently issued by Designer to further delineate and explain work of Contract.

- END -

SECTION 1B

PRELIMINARY WORK

1B-01 SITE INVESTIGATION AND REQUIREMENTS

- A. Contractor shall be held to have visited the site, prior to the time of submitting his proposal for the work, for the express purpose of examining its physical characteristics including the nature and location of the work, topography, general and local conditions, particularly those bearing on:
1. Transportation.
 2. Availability of water and electric power.
 3. Demolition (if any) and earthwork (i.e., cut and fill, excavation, grading, etc.) as required.
 4. Disposal of excavated materials, rubbish, waste and debris.
 5. Accessibility of the job site and roads.
 6. Character, quality and quantity of surface and sub-surface conditions to be encountered.
 7. Improvements, obstructions, and location of utilities.
 8. Relation that the proposed work will have to the adjoining structures and property, both public and private.
 9. Types and kinds of equipment and facilities required to properly perform the work under the Contract.
- B. Contractor shall also compare all conditions at the site with the Drawings and Specifications for the new work as required by sub-paragraph 1.2.2. of "General Conditions". Contractor shall point out to Designer, in writing, at or before time of submitting his bid, any discrepancies between Drawings and Specifications and existing conditions at the site; and shall make his bid conform to intent of Contract Documents, without additional cost to Owner.

- C. Neither Owner nor Designer. assume any responsibility for an understanding or representation made by any of their agents or representatives prior to execution of the Agreement, unless (1) such understanding or representations are expressly stated in the Agreement, and (2) the Agreement expressly provides that responsibility therefor is assumed by Owner.
- D. Maps, soil investigation reports and similar reference data made available to Contractor are given for Contractor's information only, and neither Owner nor Designer assume any responsibility for conclusions Contractor may draw therefrom.
- E. Failure by Contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work.

1B-02

TEMPORARY OFFICE AND TELEPHONE

- A. Provide temporary office at site, for Designer. Conveniently locate office. It may be temporary construction, but waterproof, weathertight, well lighted, floored, and heated during cold weather. Equip office with plan rack, desk, chairs, and 3 ft. wide x 8 ft. long counter for drawings. Entrance door shall have six inch safety hasp for padlock, or other approved locking device.
- B. Provide and pay for business telephone, equipped with loud ringing gong installed on exterior wall of office or line pole close to office, accessible to Owner, Designer and their representatives for local use without charge.
- C. Office, equipment and furniture thereof shall remain property of Owner. Remove upon completion of work.

1B-03

TEMPORARY WATER, ELECTRICAL POWER AND SERVICE, GAS

Contractor shall make his own arrangements for all utilities (water, electrical power and service and gas), required by him to carry out and complete work under this Contract. Install, maintain, and when no longer required, remove same. Such costs shall be included in Contractor's "Proposal" price.

This shall include all costs for all meters, wiring, piping, fixtures, lamps and other accessories, equipment, materials and appurtenances required therefore until final acceptance.

1B-04 TOILET FACILITIES

Provide complete toilet facilities and maintain in clean, sanitary condition with toilet tissue, paper towels and soap dispensers. Use of portable chemical type toilet facilities will be allowed.

1B-05 TEMPORARY HEAT

Whenever, in judgment of Designer, temporary heat is required for any purpose in building under construction, General Contractor is responsible for providing same at his (the General Contractor's) expense. Temporary heat may be provided by use of stoves; or, if permanent heating plant is installed sufficiently to be used, he may use same for this purpose; or by any other approved method.

1B-06 REMOVAL OF TEMPORARY CONSTRUCTION

Temporary office facilities, storage, utilities and other construction of temporary nature shall be removed as soon as progress of work will permit and portions occupied by same shall be properly reconditioned and restored to a condition acceptable to Owner and Designer.

1B-07 WATCHMEN SERVICES

Contractor shall provide such watchmen services as he may deem necessary to properly safeguard materials, tools, appliances and work. Owner shall not be held responsible for loss of, or damage to materials, tools, appliances, or work arising from acts of theft, vandalism, malicious mischief, negligence, or other causes.

- END -

SECTION 1C

TESTS AND INSPECTIONS

1C-01 GENERAL REQUIREMENTS

- A. Where any article of "General Conditions" or "Supplementary General Conditions" is supplemented herein, other provisions of such article shall remain in effect. All supplementary provisions shall be considered as added thereto. Where the following provisions conflict with said documents, the provisions herein shall supersede applicable article.
- B. Local legally constituted public authorities having jurisdiction over this construction and Designer, or his designated representative, shall be authorized persons empowered to direct tests to be made when it appears to be necessary to determine compliance or noncompliance to Contract requirements.
- C. Furnish all samples of materials required for testing to testing engineer or laboratory. Materials represented by samples under test shall not be incorporated in work without Designer's approval. Copies of all test reports with action of Designer noted thereon, will be furnished the Contractor.
- D. Contractor shall furnish all facilities for all tests and inspections, either at construction site or in fabricating shops, mills and yards; all at his sole expense unless otherwise noted. Do not cover or bury any work until it has been inspected and approved as required. If work is covered or buried before being approved, Contractor shall uncover or remove such portions of work as necessary to disclose parts in question and, after approval of such work, recover or, if not approved, replace same at his sole expense.
- E. When a Registered Special (or Deputy) Inspector, testing engineer or laboratory is required, such Inspector, testing Engineer or laboratory will be selected by Designer.
- F. Neither presence nor absence of Owner, Designer, or their authorized representatives shall relieve Contractor from any requirements of Contract Documents.

G. Tests and Inspection Reports:

1. Testing engineer and testing laboratory shall send certified copies of test reports to following:

Two copies to Owner	One copy to Contractor
Two copies to Architect	One copy to City Bldg. Dept.
One copy to Engineer of Responsibility	One copy to Supplier of Material Tested

2. Such reports shall state that all tests were made by approved testing engineer, and that all tests were made per specifications and that material tested passed or failed to pass requirements.
3. Upon completion of buildings, Testing Laboratory shall furnish, to Owner and Designer, statement (certified by Notary Public) that all required tests and inspections were made per requirements of Contract Documents.

H. Owner will pay all costs for all required concrete mix designs and "preliminary" tests and for inspection at transit-mix concrete plant.

J. Owner will pay all Testing Laboratory costs for all tests and inspections made except that Contractor will pay for such costs under following conditions:

1. When such costs are stipulated in Contract to be paid by Contractor.
2. When material is tested or inspected and fails to meet requirements of specifications and/or drawings.
3. When source of material is changed after original test or inspection has been made.

K. If, in the opinion of the Designer, any of the work of the Contractor is not satisfactorily executed, the Contractor shall make any tests that Designer may deem advisable to determine its proper construction. The Owner shall pay all costs thereof if the tests prove that the questionable work is satisfactory; if such tests prove the questioned work to be unsatisfactory, the Contractor shall pay all costs of such tests.

- L. All required tests and inspections shall be made in accordance with drawings and detailed specifications for tests and inspection of materials, equipment, installations, and applications specified herein.

1C-02

TESTS AND INSPECTIONS

Tests and inspections are required for materials, equipment, applications, installations, and systems as stipulated in Contract Documents and as required by laws, ordinances, rules, regulations, and orders of any public authority having jurisdiction at jobsite. Principal tests and inspections required are:

- A. "Earthwork": By Soils Engineer (paid for by Owner) as directed. See Article 2B-03, paragraph "B", in Section 2B.
- B. Reinforcing steel for poured-in-place concrete:
1. General: Do not fabricate material, deliver to site, or use in concrete until required tests are completed, and test reports are submitted and approved. Tests of reinforcing mesh are not required.
 2. Samples: Furnish samples as selected by Testing Laboratory. For each sampling, include not fewer than two pieces, minimum 18" length, of each size and kind of reinforcing steel.
 3. Tests by Testing Laboratory:
 - a. Identified Stock: Where taken from bundles as delivered from mill and properly identified as to heat number, one tensile test and one bending test for 25 tons, or fraction thereof, for each size and type of steel. Certified mill analysis shall accompany test reports.
 - b. Unidentified Stock and Random Samples: One tensile test and one bending test for each 5 tons, or fraction thereof, for each size and type of steel.
 - c. Exception: Bend tests are not required for special #14 bars.
 4. Inspection: Perform welding, in shop and field, under continuous inspection of Testing Laboratory or Registered Special Inspector.

C. Concrete Poured-In-Place:

1. Portland Cement shall be tested for compliance with the requirements of ASTM Designation C-150.
 - a. Portland Cement shall be sampled and tagged for identification at mill by Testing Laboratory, and shall be delivered from bins of Testing Laboratory making tests. Delivered material shall be identified with the tested lots, and no material shall be delivered that has not been tested and found to comply with the specifications. Unidentified cement shall be sampled at mixing site and tested prior to use.
 - b. Certified Mill Certificates, certifying that amount has been tested and meets requirements of these specifications will be acceptable, provided that the cement proposed for use can be identified with tested lots. Mill certificates shall be received by specified parties prior to use of any such material.
 - c. Retesting: If, in opinion of Designer and/or Structural Engineer, cement has been damaged in storage or transit or has been in storage at mixing site for over 30 days, retesting may be ordered. Payment therefor shall be made by the Contractor.
2. Aggregates: Tests of aggregate shall be made before the concrete mix is established and thereafter whenever the character or source of materials is changed, for compliance with specified ASTM Standards and as specified below:
 - a. Sampling: Samples of aggregate shall be taken by Testing Laboratory from storage bin at ready-mix plant. Aggregate shall not be delivered to ready-mix plant until pit source has been approved and plant capacity and ability to produce uniform product has been verified. Reactive aggregates not permitted.
 - b. Required Tests: As necessary to establish mix designs.
 - c. Optional Tests: Required if aggregate quality or source of same is questionable at time of use as deemed necessary by Structural Engineer.

3. Mix Designs and Preliminary Tests:

- a. Submit for approval mix designs and certified preliminary compressive strength test reports for each concrete strength, type, and maximum aggregate size required, prepared and certified by Testing Laboratory approved by the Designer. Preliminary compressive strength tests for 2000 psi concrete may be omitted.
- 1) Concrete Mix Designs: In all mix designs, state proportions for each material, including admixture, water-cement ratio, maximum allowable water content, slump, and for each material, manufacturer's name and brand, type or designation, source, aggregate sieve sizes and gradations, and other pertinent data.
 - 2) Required Compressive Strengths and Types: As indicated on Structural Drawings.
 - 3) Compressive Strength Tests: Establish strength quality of each concrete mix design proposed for use by tests made in advance of beginning operations. Prepare and test specimens in accordance with ASTM C-192-68 and C-39-68.
- b. Drying-Shrinkage Limitations (For Regular Weight Concrete Only): In addition to all other requirements set forth elsewhere, concrete for columns, walls, beams and slabs shall comply with the following:
- 1) Trial batch of the mix design(s) requiring shrinkage control shall be prepared using aggregates and cement proposed for project. From each trial batch, three specimens for determining "Drying-Shrinkage" shall be prepared in addition to six compression test specimens (6 x 12 cylinders).
 - 2) "Drying-Shrinkage" Specimens shall be fabricated, cured, dried and measured in manner outlined in ASTM Test Method C-157-66T, with following modifications:
 - a) Moist curing period shall be seven days.

- b) Measurements shall be made and reported for 7, 14, 21 and 28 days of drying.
 - c) Specification limits for 14 days will govern acceptance of mix; however, provide readings at other ages for information and smooth continuous curve connecting all points when plotted on rectangular coordinates shall be a test of validity of 14-day reading.
 - d) For any concrete mixes requiring sizes larger than 1-1/2" maximum aggregate, remove larger fractions by wet screening on 1-1/2" size screen. Remaining concrete shall be then used for fabricating specimens.
- c. Compression test specimens shall be fabricated, cured and tested in accordance with ASTM Designation C-192-68. Three specimens shall be tested 7 days and three at an age of 28 days. Strength at 28 days shall meet minimum requirements for class of concrete intended.
- d. During construction, "Drying-Shrinkage" specimens of each class of concrete shall be taken to determine continued compliance with these limitations. At least one set of three "Drying-Shrinkage" specimens shall be taken for each 1000 cubic yards placed. Compression test specimens shall be taken from same batch of concrete used for field preparation of "Drying-Shrinkage" specimens. These compression test specimens may be considered as part of normal requirements for test in connections with this project.
- e. "Drying-Shrinkage" average of three 4 x 4 x 11" test specimens shall not exceed following values after 14 days of actual drying time:

Maximum Allowable Unit Shrinkage
(Expressed in percentage of length)

<u>Maximum Aggregate Size</u>	<u>Shrinkage</u>	
	<u>Type II</u>	<u>Cement</u>
3/4-inch	0.035% +	.0038%
1-1/2 inch	0.030% +	.0030%

4. Concrete: Sample and Test as follows:
- a. Compression Tests: Make 3 standard test cylinders from each day's placing or each 100 cubic yards or fraction thereof, whichever is lesser, of each class and type of concrete. Date cylinders, number and indicate point from which sample was taken. Indicate slump test result of sample. Do not make more than 3 cylinders from any one point or batch of concrete.
 - b. Test Cylinders: Make test cylinders at job in accordance with ASTM C-31-66; 24 hours after making, store cylinders under moist curing conditions, at approximately 70 degrees F., until tested. Test specimens in accordance with ASTM C-39-64 at age of 7 and 28 days. Retain third cylinder for tests as directed.
 - c. Slump Tests: ASTM C-143-66, at same time test cylinders are made.
5. Test of Below-Strength Concrete: Core and/or load tests may be required, taken from or performed on concrete represented by unsatisfactory compressive test results. Testing Laboratory will perform such tests only if ordered by Designer.
- a. Test Costs: At Contractor's expense.
 - b. Core Tests: ASTM C-42-64. Fill holes made by cutting cores with drypack concrete.
 - c. Load Tests: In accordance with Section 202, American Concrete Institute Building Code, ACI 318-56.
6. Batch Plant Inspection: Inspection by Testing Laboratory representative at ready-mixed concrete plant is not required except when f'c is greater than 3000 psi. For each load of materials or concrete dispatched, certify to type, quantity and type of each material, water amount, and to departure time and date, a signed copy of batch plant's weighmaster's certificate to accompany each load.
- D. Precast Concrete: Tests and inspections shall be as follows:

1. At Contractor's expense, for precast concrete work perform material testing and inspections per applicable requirements of Code authorities and ASTM standards.
2. Make minimum of 3 test cylinders during each day's production of elements to verify strength and uniformity of concrete. Casting and curing of these test cylinders shall be in accordance with actual production of elements consistent with recognized laboratory procedures.
3. Provide, at Contractor's expense, continuous inspections of all field installations using welding or high strength bolted structural connections. Use services of Owner and Designer approved inspectors.
4. At manufacturer's plant, in fully coordinated manner with incidental work which will be provided by other trades, fabricate and erect full size typical Tower window opening and on prorated basis with other affected trades pay for weather tests which will be performed by Designer selected licensed testing laboratory.
5. At no additional expense to Owner, Designer or Structural Engineer, or their representatives, provide all travel and per diem expenses outside of San Francisco County as may be entailed for work of this Section except when authorized by Owner:

E. Structural Steel: Tests and inspections shall be as follows:

1. Testing Laboratory: A testing laboratory shall be selected by the Designer and be subject to approval of the Structural Engineer. Testing and Inspection shall be as required by the Drawings and these Specifications. Cost of Testing and Inspecting of Structural Steel, not including Retests, shall be paid for by the Owner.
2. Tests for Structural Steel shall be made and reports thereof furnished by the Testing Laboratory in accordance with the requirements of Section , Testing and Inspection, and the following:
 - a. Mill Tests and Inspection of Structural Steel:
 - 1) Tests of Mill Order A7 & A36 Steel:

Where A7 and A36 steel, ordered from the mill, cut to lengths, is identified by heat or melt numbers and is accompanied by mill analysis test reports, such material shall be used without further local tests, provided an affidavit is given that the materials conform with the requirements. In case of controversy, tension and bend tests of the materials, either locally or at the mill, as required for local stock will be required.

- 2) Test of Local Stock Steel: In the event local stock structural steel can be identified by heat or melt numbers and is accompanied by mill analysis and test report, such stock may be used, provided 1 tension and 1 bend test is made for each 50 tons or fractional part thereof, of such stock as may be used in the work. Complete 4 sided surface inspection may be required for materials. Each piece of high-strength local stock steel shall be tested and stamped.
- 3) Test Specimens shall be taken under direction of the testing agency and shall be machined by the Contractor to dimensions as required by the related applicable Standard ASTM Specifications.

b. Ultrasonic Material Inspection:

- 1) All column material within 1' (6" either side) of a direct butt weld for girder flange connections is to be ultrasonically tested for laminations, by the Testing Laboratory and reports thereof furnished to the Designer and Structural Engineer.
- 2) Material in the designated location is to be tested for laminations by ultrasonic means prior to fabrication, with written reports submitted to Designer and Structural Engineer.
- 3) Detection of Laminations: Rejectable defects discovered by ultrasonic means are defined as follows:

Using suitable calibrated ultrasonic equipment, flaw indications must result in 100% loss of back reflection over the entire area of the defect. The maximum permissible area of such flaw indication shall be three (3) square inches (with a maximum permissible length of four (4) inches.) Should such flaws be detected, they may be repaired by welding, subject to the Engineer's approval.

c. Tests of Welding and Bolting: The Testing Laboratory shall inspect all shop and field welding and inspect all high tensile bolting. The Testing Laboratory shall comply with all the regulations of the Department of Building and Safety of the City of San Francisco and shall certify in writing, upon completion of the work, that the welding and high tensile bolting has been performed in accordance with the Drawings and Specifications and all applicable City Ordinances.

1) Continuous Inspection High Tensile Bolts:

The Testing Laboratory shall check the bolt tightness on not less than 10% of the bolts selected at random in each high strength bolt connection. Inspection procedure shall be as described in the "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" by the Research Council on Riveted and Bolted Structural Joints.

2) Continuous Inspection of Welds:

The Testing Laboratory shall inspect all welded connections of column to column, column to girder, or girder to girder by ultrasonic or other approved non-destructive tests. All welded truss connections shall be tested 100%.

d. ULTRASONIC TESTING

- 1) Ultrasonic testing shall be performed by a specially trained, qualified technician, who shall operate the equipment, examine the welds and maintain a record of all welds examined, defects found and disposition of each defect. All defective welds shall be repaired and re-testing of defective welds shall be borne by the Contractor.
- 2) Initially, all welds requiring ultrasonic testing shall be tested at the rate of 100% in order to establish the qualifications of each individual welder. If rejectable defects occur in less than 5% of the welds tested, the frequency of testing may be reduced to 25%. If the rate of rejectable defects increases to 5% or more, 100% testing shall be re-established until the rate is reduced to less than 5%. The percentage shall be calculated for each welder independently.
- 3) When ultrasonic indications arising from the weld root can be interpreted as either a weld defect or the backing strip, the backing strip shall be removed at the expense of the Contractor, and if no root defect is visible, the weld shall be re-tested. If no defect is indicated on this re-test, and no significant amount of the base and weld metal have been removed, the joint need no further repair or welding. If a defect is indicated, it shall be repaired.
- 4) Questionable root indications that prove not to be defects shall not count against the welder to increase the test rate.
- 5) The ultrasonic instrumentation shall be calibrated by the technician to evaluate the quality of the welds in accordance with AWS-D1.0-69.

E. Metal Decking:

1. Provide, at no additional cost to Owner, test results by an independent Testing Laboratory showing that composite floor construction to be provided is equivalent

to type specified on drawings. Tests shall be performed on greased, simple span deck units to prevent chemical or adhesive bonding between concrete and steel.

2. Furnish Designer with 4 copies of test data and other substantiating evidence showing that proposed metal deck meets each and every requirement of these specifications. Where applicable, tests shall be conducted as set forth in the AISI specifications.
3. Owner will designate and pay an inspecting agency to inspect the installation and field welding of all deck units.

F. Tests and Inspections for specification Division 15 "Mechanical" shall be as follows:

1. General:

- a. Provide all tests specified and as otherwise required. Provide all test equipment including test pumps, gauges, instruments and other equipment required. Pressure gauges used shall be graduated in increments not greater than five (5) psi and shall have range of approximately twice the test pressure.
- b. Where testing is specified, or otherwise necessary, completed installation shall comply with requirements specified. Provide replacement materials and additional labor as may be required to accomplish this compliance.
- c. If, in opinion of Designer, tests are necessary to determine equality of proposed substitute, have such tests performed, at no extra charge, by an unbiased laboratory satisfactory to Architect.

2. Piping:

- a. Remove from systems, during tests, all equipment which would be damaged by test pressure. Replace removed equipment after testing. Systems may be tested in sections as work progresses; however, any previously tested portion shall become a part of any later test of a composite system. Correct leaks by remaking joints with new material; make-

shift remedies will not be permitted. Test time will be accrued only while full test pressure is on system.

- b. Do all testing before backfilling or concealing.
- c. A limit of three (3) floors per test shall be followed in a composite testing of non-pressure systems only.
- d. Perform tests in accordance with Schedule in General Mechanical section.

3. Valves:

- a. Test all valve bonnets for tightness. Test operate all valves at least once from closed-to-open-to-closed position while valve is under test pressure.
- b. Test all automatic valves, including solenoid valves, expansion valves, water regulating valves, pressure reducing valves, pressure relief valves, safety valves and temperature and pressure relief valves for proper operation at settings indicated.
- c. Test pressure relief valves, safety valves and temperature and pressure relief valves not less than three (3) times.

4. Piping Specialties:

- a. Test all thermometers, pressure gauges and water meters for accurate indication; automatic water feeders, steam traps, air vents, trap primers, and vacuum breakers for proper performance.
- b. Test all air vent points to insure that all air has been vented.
- c. Test all other piping specialties for proper operation.

5. Hanger and Supports: With systems in normal operation, test all hangers, supports and rods to insure that they are plumb and supporting their proper share of load. Additionally support, as required, systems and equipment that sway, crawl, or vibrate.

6. Other Materials and Equipment:

- a. Test all equipment for proper rotation, wiring, lubrication, auxiliary connections, venting, controls and properly set relief and safety valves.
- b. Test all other materials and equipment as specified, as recommended by equipment manufacturer, and as otherwise necessary or directed by Architect to assure that they are complete, operable, and ready for use.
- c. Perform all appropriate testing prior to equipment start-up.

7. Systems: Perform complete operational checks of all systems; assure their proper performance and "tune-up".

G. Heating, Ventilating and Air Conditioning: Test and inspections shall be as follows:

1. Air Balancing

- a. Balancing to be performed by an approved balancing specialty firm, C.I.R.C.O., in accordance with recommendations of A.A.B.C.
- b. Duct and outlet readings shall be made with Anemotherms or Velometers of recent calibration. Reading on large air intakes, coil banks and filter banks shall be made with an anemometer. Static pressure readings shall be taken with an inclined tube manometer. Electrical current readings shall be made with clamp-on type ammeter.
- c. Automatic control systems shall be adjusted for normal operating conditions.
- d. Tests shall not be conducted until all doors and windows, are in place, or under normal traffic conditions.
- e. Keep a continuous record of all test readings and submit three (3) copies of a typewritten air balancing report upon completion. The report shall include the following information, giving both specified design figures and actual observed figures:

1) Fans:

Delivery in cfm
Speed in rpm
Static pressure
Motor amperage: rated _____ actual _____
Motor HP input

2) Filter banks, and outside air, return air and exhaust air totals.

3) All supply, exhaust and return air outlets; arrange the following in columns:

Room name
Room number
Room temperature

Supply outlet size
Supply outlet setting
Supply outlet design cfm
Supply outlet actual cfm
Supply outlet air temperature

Return or exhaust outlet size
Return or exhaust outlet setting
Return or exhaust outlet design cfm
Return or exhaust outlet actual cfm

f. Adjust air quantities to the following tolerance:

- 1) Each Outlet: 10% plus or minus.
- 2) Each Room with Multiple Outlets: 0% to plus 5%.
- 3) Fans: 0% to +5%.

g. Change fan drives as required to accomplish required air quantity.

h. Allowance shall be made for air filter resistance at time of tests. Main air supply shall be at design air quantity at a pressure drop across filter banks midway between the drop across filter banks midway between the drop for clean and dirty filters.

i. After completion of testing and adjustment described above, the different systems and equipment shall be operated under normal working conditions for three (3)

consecutive twenty-four (24) hour days and a record of performance submitted. Furnish all labor required to make these tests. All tests shall be made under direction of Owner.

2. Water Balancing

- a. Balancing to be performed by an approved balancing specialty firm, C.I.R.C.O., in accordance with the recommendations of A.A.B.C.
- b. Balance all water quantities to specified GPM's at venturis. At all other locations balance by return water temperatures. Submit three (3) copies of the following data:
 - 1) Venturis: Service, location, size, required gpm, measured pressure difference, resultant actual gpm from venturi curves.
 - 2) Pumps: Number, service, model and size, impeller diameter, suction pressure, discharge pressure, elevation of each gauge above floor, rated motor amperes, actual motor amperes, required gpm, resultant actual gpm from pump curves.

3. Chemical Treatment Of Water Systems

- a. Arrange for a chemical treatment firm acceptable to Owner, such as Nalco Chemical Company, to test and analyze the steam, heating water, chilled water, and cooling tower water systems, and to submit to Designer recommendations and quotations regarding the following:
 - 1) Chemical treatment equipment, if recommended, for the steam and cooling tower water systems.
 - 2) Chemicals and a treatment program for all four of the abovementioned systems.
- b. Such tests, analysis, and recommendations are to be prior to any continuous operation of the systems.
- c. Upon receipt of the required submittal, the Designer will make recommendations to the Owner regarding the following:

- 1) The installation of recommended treatment equipment. The equipment and installation thereof is not a requirement of these Specifications.
- 2) A possible relationship between Owner and the chemical treatment firm, for chemicals and treatment services.

4. Temperature Control

Perform a complete operational check of all systems of temperature control and interlock wiring.

H. Plumbing: Tests and inspections shall be as follows:

1. Perform complete operational checks of cold water pumping system, combination standpipe pumping system, water heating system, and diesel oil pumping system.

I. Fire Sprinkler System: Perform complete operational check of alarm systems.

J. Electrical Work: Tests and inspections shall be as follows:

1. General

- a. Provide all tests specified and as otherwise required. Provide all test equipment, instruments and other equipment required.
- b. Where testing is specified, or otherwise necessary, completed installation shall comply with the requirements specified. Provide replacement materials and additional labor as may be required to accomplish this compliance.

2. Resistance of Driven Grounds: All driven grounds shall not exceed 5 ohms. When resistance exceeds 5 ohms, additional electrode(s) shall be connected in parallel.

3. Phase Unbalance: Voltage and ampere readings shall be taken at mains of each panelboard with all equipment in operation. Any unbalance between phases exceeding 20% shall be brought to attention of Designer and shall be corrected as directed by Designer..

4. Switchboard Meter Calibration

Contractor shall employ the services of a competent meter tester having the proper equipment to test and calibrate all meters. Written certification shall be furnished to Designer that metering equipment is registering correctly and has correct multipliers.

5. Insulation Resistance

Test all feeders for insulation resistance with a direct reading megger having minimum voltage rating of 500 volts D.C. The resistance between conductors and ground shall not be less than the values stated in the California Administrative Code, Title 24, Part 3.

6. Generator Start-up and Automatic Load transfer

Contractor shall direct and assist the engine generator set manufacturer and/or authorized dealer representative to perform the following tests:

- a. Start and idle for ten (10) minutes.
- b. Simulate power failure and operate generator in conjunction with automatic transfer switch for period of thirty (30) minutes with all emergency loads connected. Return to normal power. Repeat this cycle four (4) additional times, operating generator ten (10) minutes each time.
- c. Verify that engine generator continues to run for a period of sixty (60) to ninety (90) seconds after simulated resumption of normal power.

7. Lighting and Power Systems

- a. Test the power system as a whole at the completion of the work and before final acceptance with all fixtures lighted and all motors in operation.
- b. Test all individual systems and/or equipment to assure that they are complete, operable and ready for use.

8. Gunite

- a. Gunite Quality: Minimum ultimate 28 day compressive strength shall be 3000 pounds per square inch (Based on a nominal 1:4-1/2 mix).
- b. Take 2 test cylinders of Gunite each day as a material control. Test cylinders shall represent quality of Gunite being placed in the structure, and if there is more than one crew or nozzleman on work, test cylinders shall be made by each nozzleman in rotation so that tests shall represent quality of Gunite being placed by each nozzleman, all as determined by the representative of Engineer. Each cylinder shall be dated, given a number, name of nozzleman making cylinder and point in structure represented by cylinder.
- c. Gunite Contractor shall furnish at his own expense, especially constructed cylinders 6" in diameter and 12" high made of 3/4" square mesh hardware cloth.
- d. Test cylinders of Gunite shall be made with same air pressure, nozzle tip and hydration as Gunite in structure at point where cylinder was made.
- e. At end of 24 hours after cylinders have been made, hardware cloth form shall be removed and cylinders stored in testing laboratories in accordance with current issue of "Standard Method of Making Compression Tests of Concrete", ASTM Designation C 39.
- f. Separate tests of Gunite cylinders taken at same place and time shall be made at ages of 14 days and 28 days and shall be used for correlative purposes only.

K. Roof Insulation, Built-Up Roofing, and Waterproofing:
Tests and Inspections shall be as follows:

1. All roofing work shall be performed under the supervision of Roofing Consultants, Inc. (1485 Bayshore Blvd., San Francisco); Owner will pay costs.

2. A Pre-application conference shall be scheduled and held no later than 72 hours prior to start of roofing work. Attending this conference shall be representatives of; Roofing Contractor, General Contractor, Designer, Owner, Roofing Manufacturer, Roofing Consultants, Inc. (and Sheet Metal Contractor).
 3. Roofing Contractor shall give minimum of 48 hours prior notice to Roofing Consultants, Inc. before starting any roofing work. Roofing Consultant Inspector shall notify Contractors when areas to receive roofing are acceptable and ready.
 4. One test cut, 12" x 12", will be taken by Inspection Service for each 50 squares of roof area, or part thereof. Test cuts will be taken prior to final surfacing. Test cuts will be weighed and visually inspected at job site, and then removed. Additional test cuts may be taken if Inspector has reason to believe that specifications have not been followed in completing work. Areas from which test cuts have been taken shall be repaired, at Contractor's expense, in manner directed by Inspector.
 5. For testing purposed, the minimum weight requirements per square foot are as follows:
 - a. Membrane system (prior to flood coat application:) 1.52 lbs per sq. ft.
 - b. Membrane system with flood coats and double gravelling: 10.62 lbs per sq. ft.
 6. If any layer of felt, lapping of felts, mopping of pitch have been omitted, or if lapping has been stretched, Contractor, at his own cost, shall lay an additional layer of felt and an additional full mopping coat of pitch over entire roof surface for each layer, lapping or mopping found to be lacking.
- L. Aluminum Window Wall: Tests shall be as follows:
1. Test report showing finish thickness shall be made by independent laboratory, from production color runs, 3 times during coloring process. Manufacturer shall also run 3 thickness tests per day and shall submit these tests reports to Designer

2. Mock-up shall be erected in hurricane type and wind test facility supported in same manner as detailed for support on building.
3. Wind loading supplied shall be slip stream velocity of 100-110 miles per hour (equivalent to 30 pounds per square foot) and shall be accompanied by impact and cooling effect of 2-1/2 gallons of water per hour per square foot of exposed area under test, ejected at 20 to 25 pounds pressure. Mock-up shall show no evidence of leaks when subjected to this wind and water test for 10 minutes.
4. Contractor shall furnish Designer with report from an independent testing laboratory certifying compliance with above test.

- END -

SECTION 1D

SAMPLES AND SHOP DRAWINGS

1D-01

GENERAL

A. By special permission from the General Headquarters of the American Institute of Architects, sub-paragraphs 4.13.1 through 4.13.8 of the "General Conditions of the Contract for Construction" are quoted herewith for convenience. Further requirements of this Section are intended to amend and supplement these sub-paragraphs and not to void them.

B. "4.13 SHOP DRAWINGS AND SAMPLES

"4.13.1 Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Sub-contractor, manufacturer, supplier or distributor and which illustrate some portion of the Work.

"4.13.2 Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to establish standards by which the work will be judged.

"4.13.3 The Contractor shall review, stamp with his approval and submit, with reasonable promptness and in orderly sequence so as to cause no delay in the work or in the work of any other contractor, all Shop Drawings and Samples required by the Contract Documents or subsequently by the Designer as covered by Modifications. Shop Drawings and Samples shall be properly identified as specified, or as the Designer may require. At the time of submission the Contractor shall inform the Designer in writing of any deviation in the Shop Drawings or Samples from the requirements of the Contract Documents.

"4.13.4 By approving and submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or will do so, and that he has checked and coordinated each Shop Drawings and Sample with the requirements of the Work and of the Contract Documents.

"4.13.5 The Designer will review and approve Shop Drawings and Samples with reasonable promptness so as to cause no delay, but only for conformance with the design concept of the Project and with the information given in the Contract Documents. The Designer's approval of a separate item shall not indicate approval of an assembly in which the item functions.

"4.13.6 The Contractor shall make any corrections required by the Designer and shall resubmit the required number of corrected copies of Shop Drawings or new Samples until approved. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections requested by the Designer on previous submissions.

"4.13.7 The Designer's approval of Shop Drawings or Samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Designer in writing of such deviation at the time of submission and the Designer has given written approval to the specific deviation, nor shall the Designer's approval relieve the Contractor from responsibility for errors or omissions in the Shop Drawings or Samples.

"4.13.8 No portion of the Work requiring a Shop Drawing or Sample submission shall be commenced until the submission has been approved by the Designer. All such portions of the Work shall be in accordance with approved Shop Drawings and Samples".

- C. Provide samples and shop drawings as required by all sections of the specifications.
- D. Samples and shop drawings as defined above shall be submitted in sufficient time to permit proper consideration and action before any materials and items that samples and shop drawings represent, are delivered to job site. Work dependent on shop drawings and samples shall not be started until Designer's approval is received.
- E. Contractor will be held responsible for any delay in progress of the work due to his failure to observe these requirements; time for completion of his contract will not be extended on account of his failure to submit samples and shop drawings promptly.

- F. Designer will provide General Contractor with printed pads of Transmittal Sheets. For each submittal to Designer General Contractor shall, in conformance with Designer's instructions, completely, accurately, clearly and legibly prepare in quintuplicate one of these transmittals. He shall retain Contractor's (yellow) copy and forward four remaining copies to Designer with submission.

1D-02

SAMPLES

- A. When samples are required, materials and equipment furnished to the job, and their installation, shall conform in all respects to samples approved by Designer. Written approval of samples is required.
- B. Failure of samples to conform with specified requirements may, at Designer's option, constitute a bar against submission of other samples by same manufacture, vendor or supplier.
- C. Approval or acceptance of samples will not preclude rejection, prior to final acceptance of completed work, of any material upon discovery of defect in material which said sample failed to represent, even though such material or equipment has been installed or erected in place.
- D. After material has been approved, no change in brand or make will be permitted unless satisfactory written evidence is presented to, and approved by, Designer that manufacturer cannot make scheduled delivery of approved material, or that material delivered has been rejected and substitution of suitable material is an urgent necessity, or that other conditions are apparent which indicate approval of such substitute materials to be in best interest of Owner.
- E. All samples of materials requiring laboratory tests shall be submitted to laboratory for testing not less than 45 days before such materials are required to be used. All other samples, manufacturer's literature and other sample information shall be submitted for approval within 30 days after signing of contract.
- NOTE: Designer will not proceed with color schedule until all samples have been submitted and approved.
- F. Samples, manufacturers' literature and material lists shall be submitted in quadruplicate, except where greater or lesser number is specifically required by specifications.

- G. Samples shall be submitted by Contractor only, unless he has authorized his subcontractor to submit them and has notified Designer to this effect. Such samples shall be shipped (prepaid) by Contractor.
- H. Samples will receive consideration only when submitted with "Transmittal", signed by Contractor. Transmittal shall contain list of samples, project name, Contractor, manufacturer, brand, and quality, also job number, specifications paragraph numbers to which samples refer, ASTM or Federal Specification Numbers (if any) and additional information as may be required to completely identify particular material being furnished. Samples receive without identification transmittal will be considered "unclaimed goods" and held for limited time only. Any deviation from contract requirements shall be noted in transmittal.
- J. Each sample and manufacturers' literature referring to item shall be labeled to indicate name of project, Contractor, manufacturer, brand, job number, Federal Specification number, ASTM number, or other specified "standard" test, where required. In addition, catalogs shall be marked to indicate specific items submitted for approval.
- K. When samples are rejected by Designer, submit new samples as soon as possible after notification of rejection, and mark them "Resubmitted Sample", in addition to other information required, on label.
- L. Right is reserved to require submission of samples of any material or any material lists, whether or not particularly mentioned in specifications.

ID-03

SHOP DRAWINGS

- A. Submit, without causing delay in work; layout, detail schedules, setting and shop drawings, of parts of the work as specified or required. Submit per following:
 - 1. Submit to Designer in form of an ozalid tracing (reproducible) and two prints. Drawings shall have adequate Title Block and shall include project name and identification number.
 - 2. Designer will make his corrections and notations or approval on ozalid reproducible and return it to Contractor. If corrections are required Contractor shall resubmit ozalid reproducible incorporating corrections. This process shall be repeated until Designer's approval is obtained.

3. Contractor shall then furnish one print of approved drawings to Designer, without cost to Owner.
- B. All drawings and details, when submitted, shall bear stamp of approval of Contractor as evidence that such drawings and details have been checked by him. "Stamp" shall clearly state that Contractor has checked drawings and, by his signature, Contractor certifies. Any drawings submitted without executed stamp of approval, or whenever it is evident (despite stamp) that drawings have not been checked, they will be returned to Contractor for resubmission. Where Contractor has not complied with this article he shall bear risk of all delays to same extent as if no drawings or details had been submitted.
 - C. Before submitting shop drawings, check said drawings and subcontractors work for accuracy. See that work contiguous with and having bearing upon work indicated on shop drawings is accurately and distinctly illustrated and that indicated work complies with contract requirements.
 - D. Shop drawings shall be dated and shall clearly delineate following:
 1. Designer's name.
 2. Project name, address, and Designer's job number.
 3. Drawing title, number, date and scale. (Number drawings consecutively.)
 4. Names of Contractor, Sub-contractor and Fabricator.
 5. Working and erection dimensions.
 6. Arrangements and sectional views.
 7. Necessary details, including complete information for making connections with other work.
 8. Kinds of materials and finishes.
 9. Show descriptive names of materials and equipment, and locations at which materials or equipment are to be installed in the work. Use same reference identification as shown on Contract drawings.

- F. In connection with Mechanical and Electrical Work, Contractor shall submit complete list of materials and other required information, as listed under respective mechanical and electrical sections of these Specifications, within 30 days after receipt of notice to proceed; no consideration will be given to partial lists submitted from time to time.
- G. Prepare composite drawings and installation layouts when required to solve tight field conditions. Drawings shall consist of dimensioned plans and elevations, and shall give complete information, particularly as to size and location of sleeves, inserts, attachments, openings, conduits, ducts, boxes, and structural interferences.
1. These composite shop drawings and field installation layouts shall be coordinated in field by Contractor and his subcontractors for proper relationship to work of applicable trades, based on field conditions, and shall be checked and approved by them before submission to Designer for his final approval. Contractor shall have competent technical personnel readily available for coordinating and checking, as well as for supervision of field installation layouts.
- H. When manufacturer's printed literature is required to be submitted to Designer it shall be submitted in original form. Fading type of reproductions will not be accepted. Minimum of 4 copies each are required; 2 for Designer and two to be returned to Contractor, who shall submit additional copies as required for his distribution.
- J. Cost of changes in construction due to improper checking and coordination by Contractor shall be paid for by him. Contractor shall be responsible for all additional costs, including coordination and supervision.
- K. If shop drawings show variations from Contract requirements because of standard shop practice, or any other reasons, make specific mention of variations in transmittal letter to Designer as well as encircle variations, on shop drawings to identify and call them to Designer's attention.
- L. Unless Contractor has notified Designer of variations, deviations, or omissions and received his approval, Contractor will be required at his sole expense to repair, re-

place, furnish whatever materials are required and perform all work necessary to rectify such deviations, variations etc.; all as directed by Designer at time such variations, deviations and/or omissions are discovered by Designer even though this does not occur until after said shop drawings have been "approved" and work in question has been completed. Replacement and repair will be mandatory in such instances and shall be performed at no cost to Owner.

- M. Designer's approval of shop drawings will be general and shall not relieve Contractor of responsibility for accuracy of such shop drawings, nor for proper fitting, construction of work, furnishing of materials, or work required by the Contract Documents although not indicated on shop drawings. Shop drawings approval shall not be construed as approving departures from Contract requirements or as acceptance of any responsibility by Owner and Designer for any errors, omissions, or discrepancies shown thereon.
- N. Approval of shop drawings and schedules shall not relieve the Contractor from responsibility for any violation, indicated on shop drawings or schedules, of local, county, state or federal laws, rules, ordinances, or rules and regulations of commissions, boards or other authorities or public utilities having jurisdiction.

- END -

SECTION 1E

ALTERATION WORK IN AND TO EXISTING BUILDINGS

Requirements of Division 1 shall apply to this Section.

1E-01 SCOPE

With exceptions noted in Article 1E-04, entitled "Work Not Included", Contractor is responsible for furnishing all materials, tools, equipment, facilities, and performance of all labors and services necessary for and reasonable incidental to proper execution and completion of all Alteration Work" in and to existing buildings, whether specifically mentioned or not; all as shown on the drawings and as specified.

1E-02 INTENT

It is intent of drawings and these specifications that there be no gap between terminus of required "Alteration Work" and "New Work" under the Contract. Therefore should Contractor have doubt as to extent of any of various phases of required work (new and alteration) or should he find a gap between terminus of "Alteration Work" and required interconnection of new and existing work, he shall, prior to submitting his proposal, give written notice of such deficiency of coverage to Designer who will issue necessary clarifications to all concerned. Should deficiencies become manifest after bidding, Designer's decisions shall be final and binding and no additional compensation will be allowed.

1E-03 EXAMINATION OF EXISTING BUILDINGS AND SITE

- A. Prior to submitting proposal, existing site and buildings in (and to) which Alteration Work is to be performed should be carefully examined. Contractor is cautioned to carefully and thoroughly examine existing Buildings, as he will be held responsible for proper completion of all work required in accordance with drawings and specifications.
- B. Submission of a proposal shall imply that bidder has made an examination and is thoroughly familiar with existing conditions and the alteration work required. No claims for additional compensation for labor, materials, equipment and for difficulties encountered (which could have been foreseen had such an examination been made) will be paid.

1E-04 WORK NOT INCLUDED

Owner will move and store furniture, tables, and other items of portable equipment in existing buildings as required for Alteration Work. These items may be stored (by Owner) in existing building in which Alteration Work is to be performed.

1E-05 CONSTRUCTION SCHEDULE AND REQUIREMENTS

- A. Special attention is called to fact that it is intent of Owner that existing building will be in use (by Owner) throughout construction program. Therefore, it is imperative that Contractor cooperate with Owner in scheduling (and re-scheduling at any time necessary in Owner's opinion) all Alteration Work so that interruptions (due to required construction) of normal usage of existing structure will be kept to an absolute minimum.
- B. Due to nature of operations performed within these facilities, it will be necessary for Contractor to closely cooperate with Owner in seeing that functions of these facilities are not unduly interrupted during construction period.
- C. Avoid all unnecessary noises. Any portion or procedure of construction program which can be performed in other locations shall, at Contractor's option, or when so directed by Owner be performed in locations less objectionable or more remote. Locations of such removed points of operation shall be as agreed upon between Owner and Contractor. Notify Owner of when and what noisy operations are to be performed in alteration and new work (including Tower).
- D. Contractor is cautioned that, in some locations, it will be impossible for Owner to completely vacate entire wings and, in certain areas, entire rooms; therefor, Contractor shall be prepared to erect dust barriers, sound barriers, use drop cloths, or other approved means to protect equipment, finishes, and, in immediate vicinity of some of the work, occupants of various rooms.
- E. Contractor is cautioned that all openings, (roofs, walls and doors) shall be closed and both new buildings and existing building shall be protected from elements at all times.
- F. Contractor shall not disrupt existing services or utilities for any reason, without obtaining Owner's prior ap-

proval and instructions in each case. Contractor is cautioned that utility services can be interrupted for limited periods of time and such interruptions must be restricted to agreed upon areas and times. Contractor shall conform to Owner's requirements as to exact time interruptions can be allowed and length of time utility services can be shut-off even though time or times designated by Owner is or are before or after Contractor's regular working hours or days (including Saturdays, Sundays, or holidays); such "Overtime" work shall be at Contractor's sole expense. Owner understands that certain portions of utility systems must be discontinued to allow Contractor to work; cooperate with Owner in scheduling and coordinating his work so that interruptions will be kept to a minimum.

- G. Special care shall be taken not to demolish, scratch, or in any way deface existing buildings, including furnishings therein as Contractor will be held responsible for protect of same throughout construction program.
- H. In general, sequence of construction shall be continuous operation as outlined herein. Contractor may, at his option, devise more economical and expeditious sequences for prosecution of his work, and these will be given due consideration by Owner when submitted in writing for his approval. Contractor shall, in all cases, give Owner ample written notice (minimum of two weeks) before starting work in, or to, existing buildings. Such notice shall specifically state time such work will be started and anticipated completion date of same. Sequence of construction shall be as follows:
 - 1. Construction and completion of alteration work within existing buildings shall be performed in accordance with schedule agreed upon between Owner and Contractor, prior to start of said alteration work.
- I. Contractor is herewith notified that once he starts alteration work within the existing buildings, he shall have all tools, equipment and materials required for this portion of the work on job site to eliminate any delay. He shall also have available, at moment's notice, personnel from all crafts or trades required for performance of work.
- J. Powder actuated tools shall NOT be used without prior approval of Owner.

1E-06

SALVAGE

- A. Owner will be sole judge as to what materials and equipment, in or on existing buildings, are to remain his property and what is to be classed as debris and removed from site and disposed of by Contractor, with exceptions as specified. NOTE: See "Demolition and Earthwork" Section regarding "salvage" of materials and equipment from demolition work included in this Contract.
- B. All materials and equipment, (including cabinets, shelving, doors, sash, trim, hardware, etc.), which are to be moved from their present location in existing buildings, shall remain Owner's property. Contractor shall store on premises, in an approved manner, or re-use these materials and equipment in accordance with notations on drawings, these specifications or as directed by Designer.
- C. With exceptions noted on drawings or specified these "salvaged" materials and equipment, shall not be reused in the work without Designer's written approval.

1E-07

ALTERATION WORK - GENERAL

- A. Alteration work shall be as indicated or specified.
- B. Except as otherwise indicated or specified, all surfaces that are cut or damaged in removal of existing work or in the construction of new work shall be repaired and refinished to match applicable adjoining work.
- C. All new materials required (i.e., concrete, plaster, partitions, flooring, and similar items) shall match applicable existing and adjoining materials.
- D. In reference to division of "Alteration Work" in various sections of these specifications (i.e., "Concrete", "Masonry", "Metal Lathing and Plastering", "Painting", "Plumbing", "Electrical", etc.) various items of work have, insofar as is practical, been divided by "trades" in applicable specification sections. However, it shall be understood that Contractor is responsible for fulfillment of alteration work as a whole in accordance with Contract Documents.
- E. To further emphasize above requirements, following examples are given:

1. Remove existing partitions, windows and doors, as required by drawings. Demolition shall be conducted so that materials and equipment will be salvageable, for reuse as noted on drawings, as specified, or as directed.
2. Openings which are to be closed shall be framed in and finished with materials identical in every respect to that in adjoining existing work, unless otherwise indicated. When closures are completed, there shall be no visible evidence of their ever having existed with exception of difference in shading of new materials and existing materials.
3. Neatly cut and head up all new openings in existing partitions and walls. Openings shall be framed, cased, and finished in accordance with all applicable portions of these specifications and drawings.
4. Patch, repair, level and clean floors before applying new flooring.
5. Where existing partitions are removed, patch, repair, level and refinish flooring, ceilings and walls, as required to match adjoining surfaces.
6. Existing work that is removed and reset, or that is affected in any way by alterations (interior and exterior) shall be refinished to match adjacent finished surfaces (with exceptions specified or indicated)
7. Before painting work is commenced, all surfaces shall be cleaned of rust, scale, loose paint, grease, or other foreign materials. Surfaces (including "patched" and "new" plaster, shall be completely dry before applying new finish.
8. Previous coatings of all types shall be removed, if removal is necessary in order to secure satisfactory refinishing results. Sand all glossy paint and enamel surfaces to remove gloss before refinishing. Scrape off all loose paint and sand smooth. Badly blistered paint and varnish, shall be removed with non-inflammable paint and varnish remover and surface sanded smooth.
9. Cutting, patching, and repairing of existing structures necessitated by removal or relocation of existing plumbing, heating, and electrical fixtures

and equipment (including piping, wiring, etc.) shall be performed by mechanics skilled in applicable trades involved.

10. In all cases extreme care shall be exercised in all cutting operations. Operations shall be performed under supervision by competent mechanics skilled in applicable trade. Openings shall be neatly cut and shall be kept as small as possible to avoid unnecessary damage. Carelessness will not be tolerated, and Contractor will be held responsible for any avoidable or willful damage to existing work.
11. All replacing, patching, and repairing of all materials and surfaces cut or damaged in execution of work shall be performed by experienced mechanics of the several trades involved. Replacing, repairing and patching shall be done, with applicable materials, in such manner that all surfaces replaced, will, upon completion of work, match surrounding similar surfaces.
12. Carefully patch and repair existing roofing per applicable (in Designer's opinion) portions of "Built-up Roofing, Roof Insulation and Waterproofing" Section; guarantee specified therein is required for Alteration Work as well as "new" roofs.

- END -

SECTION 1F

ALTERNATES

Requirements of Division 1 apply to work of this Section.

1F-01 SCOPE

Each Alternate Bid shall state the net sum to be deducted from or added to Base Bid, in event that Alternate Bid is accepted.

- a. Acceptance or Rejection of Alternate Bids: Owner reserves right to accept or reject any or all Alternate Bids.
- b. Basis: Include in each Alternate Bid all changes in cost resulting in the work of all trade sections of the Specifications affected thereby. Where alternate drawings, details, or Specifications are furnished which relate to the Alternate Bid, Bidder shall base his Alternate Bid on such drawings, details, or Specifications. Work required by Alternate Bids shall be performed in accordance with specifications of trade sections affected, and applicable drawings, unless otherwise specified.
- c. Extent: Contractor shall determine to his own satisfaction extent of work affected by each Alternate Bid and shall make full and proper allowance therefore in preparation of his Proposal.

1F-02 ALTERNATE NO. 1: WATER CLOSET CODE "A"

State the amount to be deducted from or added to the Base Bid if Code "A" Water Closets, and related work, as specified in Article entitled "Alternates" (in "Plumbing" Section 15C) are substituted in lieu of Code "A" Water Closet as specified in Article 15C-05 (entitled "Plumbing Fixtures") and as shown on the drawings.

1F-03 ALTERNATE NO. 2: INTERIOR ALUMINUM (SPANDREL) PANELS

State the amount to be deducted from or added to the "Base Bid" if Ferro Enameling Co.'s (Oakland, Calif.) porcelain enameled "Ferrowall" panels, as specified herein, are substituted in lieu of aluminum panels (in bay windows of suites and guest rooms) specified in "Aluminum Window Wall" Section 8B and as indicated on the drawings.

- a. Porcelain enamel shall be in accordance with current edition of "Recommended Standards of Manufacture and General Specifications" issued by the Architectural Division of the Porcelain Enamel Institute, Washington, D.C. The matte Nature Tone color is to be as selected by Architect, samples of which are to be submitted for approval before being manufactured. Steel shall be 14 gauge stretcher leveled enameling iron. Color of porcelain enamel shall, in designer's opinion, match anodized aluminum windows.

1F-04 ALTERNATE NO. 3: EXTERIOR SPANDREL PANELS

State the amount to be added to or deducted from the "Base Bid" if "Ferrowall" porcelain enameled panels, as specified in preceding Article 1F-03 "Alternate No. 3", are substituted in lieu of "Spandrel Glass: panels specified in "Glass and Glazing" Section 8C and indicated on the drawings.

1F-05 ALTERNATE NO. 4: FLEXIBLE PIPING CONNECTIONS

State the amount to be deducted from or added to the "Base Bid" if removable pipe sections, as specified in Article 15B-30 (Section 15C), are substituted for flexible pipe connections as specified and indicated on the drawings.

1F-06 ALTERNATE NO. 5: SOUND TRAPS

State the amount to be deducted from or added to the "Base Bid" if duct, insulation, and lining is substituted for certain Sound Traps as specified in Article 15B-30 (Section 15B) and as indicated on the drawings.

1F-07 ALTERNATE NO. 6: VENTURIS

State the amount to be deducted from the "Base Bid" if venturis are deleted as qualified in Article 15B-30 (Section 15B0 of the specifications.

1F-08 ALTERNATE NO. 7: LAVATORY COUNTER MARBLE

State the amount to be deducted from or added to the "Base Bid" if "Almiscato" marble is substituted in lieu of specified "Lios Portugal" marble for Guest Room lavatory counter tops.

- 1F-09 ALTERNATE NO. 8: LAVATORY COUNTER MARBLE
- State the amount to be deducted from or added to the "Base Bid" if "Botticino" marble is substituted for specified "Lios Portugal" marble for Guest Room lavatory counter tops.
- 1F-10 ALTERNATE NO. 9: LAVATORY COUNTER MARBLE
- State the amount to be deducted from or added to the "Base Bid" if "Perlato" marble is substituted for specified "Lios Portugal" marble for Guest Room lavatory counter tops.
- 1F-11 ALTERNATE NO. 10: LAVATORY COUNTER MARBLE
- State the amount to be deducted from or added to the "Base Bid" if "Statuary Veined" marble is substituted for specified "Lios Portugal" marble lavatory counter tops.
- 1F-12 ALTERNATE NO. 11: GUEST ROOM WINDOWS
- State the amount to be deducted from or added to the "Base Bid" if combination casement and hopper windows in Guest Rooms, as indicated on the drawings, are substituted for the casement windows specified and indicated on the drawings.
- 1F-13 ALTERNATE NO. 12: INTERIOR ALUMINUM (SPANDREL)
- State the amount to be deducted from or added to the "Base Bid" if wood grained laminated plastic (Formica or approved equal) with applied molding as indicated on the drawings is substituted for the aluminum panels (in bay windows of suites and guest rooms) specified in "Aluminum Window Wall" Section 8B and as indicated on the drawings.
- 1F-14 ALTERNATE NO. 13:
- State the amount to be deducted from or added to the "Base Bid" if clear polished plate glass is substituted for the indicated and specified "Solar-Bronze" or "Parallel-O-Bronze" glass in all windows excepting in the Skybar level.

- END -

SECTION 2A

DEMOLITION

Requirements of Division 1 apply to work of this Section.

2A-01

SCOPE

Required: Provide all materials, equipment, services and labor required to complete the demolition, site clearing and preliminary work as indicated on the drawings and specified herein.

- A. In general, demolition work consists of the removal of the following buildings contained on a portion of the block bounded by Geary, Post, Powell and Mason Streets as identified as follows:
1. 350 Geary Street, eleven stories and basement. Demolish to basement slab, retain sidewalk with support at Geary Street.
 2. 360-362 Geary Street, five stories and basement. Demolish to basement slab, retain sidewalk with supports at Geary Street.
 3. 465 Post Street, seven stories and two basements. Demolish to basement slab, retain sidewalk with supports at Post Street.
 4. And elsewhere as indicated.
- B. Remove all other items of work as indicated on the drawings including: flagpoles, steel columns, chimneys, walls, skylights, fencing, and air shafts.
- C. Remove fans, air-conditioning units, ducts, piping, plumbing fixtures, tanks, lighting fixtures, electrical outlets and devices, panels, conduit, wire and all other mechanical and electrical items which are to become redundant. Cap all removed ducts, piping and conduit, and tape electrical conductors, at perimeter of demolition area.
- D. Relocate ducts, piping and conduit which are to remain in service, especially those presently rerouted through the demolition area but serving other areas. Maintain continuity of services as specified in Section 1E."

- B. Remove all other items of work as indicated on the drawings including: flagpoles, steel columns, chimneys, cooling towers, pipes, ducts, walls, skylights, vents, fencing, and air shafts.

2A-02 WORK NOT SPECIFIED IN THIS SECTION

- A. Protection fences and sidewalk barricades shall be erected under the General Contract and left in place when the demolition work is complete.
- B. Termination of all utility services prior to commencement of demolition work. (In event that work specified under this section reveals that any utility services have not been terminated, Contractor shall immediately notify the Architect who will issue instructions as to procedure.)
- C. All underpinning, shoring, excavation, bulkheading, dewatering and all related work.

2A-03 PERMITS

Obtain and pay for all permits required to perform the work as required by all local codes and agencies having jurisdiction.

2A-04 MAINTENANCE OF TRAFFIC & ACCESS

- A. Throughout progress of work, do not interfere with use of or access to adjacent buildings or to sidewalks and streets.
- B. Do not close or otherwise obstruct sidewalks or streets without obtaining and paying for permits to do so.
- C. Maintain accessibility from street at all times to any fire hydrants within construction area.

2A-05 INSPECTION

- A. Before starting demolition work, make inspection survey with applicable Owner or Owners to determine physical condition of adjacent structures.
- B. A survey of existing cracks, including photographs, shall be made on all adjacent buildings prior to any demolition. A continuous survey of the elevations of selected points on these buildings shall be made.

2A-06

DEMOLITION

- A. Remove all buildings to sidewalk level or to top of basement floor slab as shown on the drawings.
- B. Leave all sidewalks in place. Provide all shoring and supports for sidewalks as required to prevent damage or collapse of same due to demolition operations.
- C. Execute demolition work to ensure safety of adjacent property against damage by settlement, falling debris or other causes in connection with this work.
- D. Demolish concrete and masonry in small sections. Lower heavy framing members carefully.
- E. Wet down site and areas being demolished when required to prevent dust and dirt from rising.
- F. Remove salvage and debris from the site as it accumulates. Do not store, sell, burn or otherwise dispose of debris on the site. Removal of debris includes clearing of basements and similar excavations. Remove all materials in such manner as to prevent spillage. Keep all pavements and areas adjacent to and leading from the site clean and free of mud, dirt and debris at all times.
- G. Erect and maintain temporary bracing, shoring, lights, pedestrian protection barricades (except permanent protection fences and sidewalk barricades), warning signs and guards necessary to protect streets, sidewalks and adjoining property from damage, all in accordance with local codes.

2A-07

UTILITY LINES

- A. Seal or cap utility lines to or from site at property lines or service side of meters. Remove all on-site lines to point where capped. Remove above grade lines to point of turning off services.
- B. Contractor is permitted to leave certain water lines in place as may be required for his work under the contract. He shall, however, be responsible for arranging for all service, installation of meters, pipes, valves and connections and shall pay all costs thereof. Temporary water service shall not interfere with additional work under the contract and shall be removed when the work is completed.

- C. Do not remove any lines or services of public utility companies. Where removal and/or relocation of such lines is required, make all arrangements with the utility company involved.

2A-08

TRANSFER OF RESPONSIBILITY AND DISPOSITION OF MATERIALS

- A. Title to all materials and equipment to be demolished shall be transferred to and vested in the Contractor upon receipt of Notice and Award whereupon the Owner will NOT be responsible for the condition, loss or damage to said property.
- B. Salvage value of materials removed shall be considered in the bid submitted for the demolition work.

- END -

SECTION 2B

SITE DEVELOPMENT: EARTHWORK,
PAVING, WALKS, CURBS, ETC.

Requirements of Division 1 apply to work of this Section.

2B-01 SCOPE

Required: All labor, material, equipment and facilities necessary for completion of site development including but not limited to shoring and bracing of adjacent structures, excavation, removal and disposal of all slabs, paving, sidewalks, curbs, gutters, street paving and existing building foundations on and surrounding site as shown on drawings or as required to make way for excavation and installation of new work. Disconnect, plug or valve all utilities at boundary of excavation, as required; de-watering; bank protection; grading; preparation of subgrade for fills; proper placement of fills, including backfilling and compaction; selection of approved soils for stockpiling and reuse for backfill; and related work required for exterior paving, curbs, and other work included in this contract.

2B-02 GENERAL

- A. Demolition is specified under "Demolition" section of this specification.
- B. Keep excavations and trenches free of standing water.
- C. Provide and maintain during work, all protections and fences required by specification and drawings and by State and City Codes and safety regulations.
- D. Do all shoring, bracing required by Codes and necessary to maintain excavated slopes and protection of all surrounding property, as as utilities, streets, curbs and sidewalks.

2B-03 TEST BORINGS AND SOIL DATA

- A. Report of soil investigation of site as prepared by Woodward-Clyde & Associates, Soils Engineer, is on file at the Architect's office; with exceptions indicated,

soil investigation report is for information only and neither Owner nor Designer assume any responsibility for conclusions Contractor may assume. Data on borings and soil conditions are from actual borings and from best information available. Depths to various types of soil material are approximate and are given for general information in connection with this work.

- B. Soils Engineer and Tests: A Soils Engineer and Licensed Testing Laboratory, designated by the Owner, will be engaged to perform continuous inspections of placing and compacting of all fills and backfills within limits of grading of this project. All work shall be done per these specifications and as recommended and approved by Soils Engineer. Soils Engineer shall make tests of soil at bottom of mat before mat is placed to determine if any modification of mat design or soil condition is required before mat construction proceeds. Costs for all such inspection and tests shall be paid by Owner.

2B-04

SHORING AND BRACING

- A. Contractor shall underpin or shore and brace adjacent buildings and sides of excavation to retain earth banks and protect excavations and adjoining grades from caving, adjacent buildings from settling and other damage resulting from excavating; including suitable forms of protection against bodily injury to personnel employed on work. Responsibility for design, installation and maintenance of required cribbing and shoring shall be Contractor's.
- B. Shoring and underpinning design and plans shall be prepared by licensed Civil Engineer.
- C. It is anticipated that "Slurry Trench Wall" will be used around the site. Wall and bracing shall be designed for lateral earth pressures recommended in soil report. If Contractor elects to use a system of direct underpinning, lateral pressures may be modified to deduct surcharge pressure of adjacent building foundations.
- D. Prior to starting work, Contractor shall make complete survey of all neighboring buildings to note any existing conditions that might be claimed as having been caused by this work. Contractor shall establish approximately 20 settlement survey markers on buildings and 6 markers in streets. He shall record elevations of markers

weekly, more often, if so directed by Engineer. Readings shall be taken to nearest 0.001 foot and report shall be given to Engineer and Foundation Engineer.

2B-05 DE-WATERING

- A. An adequate de-watering system shall be provided to keep construction area reasonably dry and free from all standing water. De-watering shall be continued for as long as necessary or at least until Ground Floor has been constructed. Responsibility for design, installation and maintenance of de-watering system shall be Contractor's.

2B-06 EXCAVATIONS

- A. Perform all excavations required to complete entire work in this Contract regardless of character of work encountered. No adjustment will be made for variations in hardness, type, or density of materials removed. Excavation shall conform to dimensions and elevations shown on drawings, and leveled off at exact depth required. Widths of excavations shall be sufficient to facilitate easy placing and removal of formwork, and installation of protective shoring and bracing as may be necessary to prevent caving of banks.
- B. Structural excavation shall be exactly to indicated levels, with over-depth excavation corrected with concrete at Contractor's expense.
- C. Excavated material not suitable for fill shall be disposed of off site.

2B-07 FILL MATERIAL

Fill and backfill material shall be clean, pulverized, free from deleterious material and shall be as approved by Architect.

2B-08 BACKFILL

All backfill under slabs and behind walls shall be compacted to 95% relative density by modified A.A.S.H.O. tests.

2B-09 CONCRETE WALKS AND CURBS

All miscellaneous site concrete work shall be constructed 3000 pound concrete in accordance with Concrete Section of specifications. Curbs, gutters and driveways within public right-of-way shall be per applicable City of San Francisco Standards.

2B-10 OFF-SITE IMPROVEMENT

To limits designated and required, provide street work, curbs, gutters, driveways and sidewalks, new curbs, gutters and sidewalks along Post and Geary Streets. Perform work and provide all testing, inspections and pay all fees or assessments in accordance with applicable requirements of governing authorities. Coordinate this work with entailed extensions of sewers and utilities which may be specified to be performed under other Sections of Specifications for this General Contract.

2B-11 DUST CONTROL

During all grading operations water shall be applied to surfaces in working area, as required, and in sufficient quantities to allay dust.

2B-12 CLEAN-UP

Upon completion of work of this section, remove rubbish, trash, and debris resulting from operations. Remove disused equipment and implements of service; and leave entire area involved in neat, clean and acceptable condition.

- END -

SECTION 2C

ASPHALTIC CONCRETE PAVEMENT

Requirements of Division 1 shall apply to this Section.

2C-01 SCOPE

Provide, in place, all asphalt concrete paving, including patching existing.

2C-02 SUBGRADE PREPARATION

- A. Remove all obstructions and grade areas to receive asphalt paving. Subgrade shall be true to grade, sloped to drain as indicated, hard, uniform and smooth. Use heaviest equipment practical for areas involved.
- B. Weed Control: Use an approved commercial weed killer under all areas to be paved. Guarantee for at least 1 year to remove all weeds growing through paving and repair all damage caused by repair work. Further, if number of weeds appearing through paving during guarantee period exceeds 5 per 100 square feet, affected area shall be removed, soil re-sterilized and paving replaced at Contractor's expense.

2C-03 SOIL STERILIZATION

- A. Placing: Treatment shall be made after subgrade has been completed and just prior to placing base course. Area shall be thoroughly sprinkled to distribute chemical for a depth of 3" into the subgrade.
- B. Compound: Sodium Chlorate - Sodium Borate Treatment, applied at a rate of 3 lbs. to each 100 sq. ft. Use in water solution at rate of 1 lb. of sodium chlorate to one gallon of water and uniformly spray over area. Commercial mixture of sodium chlorate and soluble borax may be used where the chlorate content of treatment includes 1 lb. of sodium chlorate per 100 sq. ft. of area.

2C-04 PRIME COAT

In advance of spreading the asphaltic concrete binder course over the compacted subgrade, a prime coat shall be applied. Prime coat shall consist of liquid asphalt primer Grade MC-1 applied at a temperature of from 110° to 185°F. and at rate of from 0.25 to 0.50 gallons per square yard.

ASPHALT CONCRETE PAVEMENT

- A. Base course and asphaltic concrete materials shall meet requirements of City of San Francisco.
- B. Preparation of Surface To Be Paved:
1. Remove cracked and spalled portions of existing asphalt paving adjacent to areas to be paved. Chip back and slope existing asphalt paving as necessary to eliminate future cracking and spalling where new paving is applied.
 2. Asphaltic concrete base, leveling and surface course shall be spread upon properly prepared surface, true to grade, free of standing water and of all loose and foreign materials. Surface to be paved may be damp but not saturated; wholly, in part, or in spots.
 3. Concrete surfaces shall be entirely dry. Portland cement concrete or old asphaltic concrete surfaces shall receive a tack coat of a uniform application of from 0.05 to 0.10 gallons per square yard of emulsified asphalt, Grade RS-1 or SS01, or suitable cutbacks applied with a hand spray.
- C. Placing Asphaltic Concrete:
1. Contractor shall use skilled asphalt workers, and equipment suitable to size of work spreading, compacting and finishing the surface course. Unless otherwise indicated, asphaltic concrete shall be 2" thick after compaction. Carefully feather new paving into existing.
 2. Hand raking shall be held to minimum. Rake shall be used only to remove excess material, and additional material shall be added only to low areas. Hand spreading shall be done in competent and careful manner, and labor force shall be of sufficient size and skill so that operations will be rapid and smooth and mix will not become chilled before spreading is completed. No mix shall be placed at atmospheric temperatures below 40° F. Only hot tools shall be used.
- D. Compaction of Asphaltic Concrete: Areas inaccessible to roller shall be completed by means of hand methods, continuing until mixture is thoroughly compacted and surface smooth.

2C-06

PROTECTION

Exercise all precautions necessary to protect exposed finished surfaces, such as curbs, walks, and adjacent building, from becoming disfigured by application of primer or other asphaltic materials, or from physical damage resulting from contact with spreading or compaction equipment. Surfaces which are damaged shall be satisfactorily cleaned, repaired, or replaced, as approved by the Designer, at not additional cost to Owner.

2C-07

INSPECTION AND TESTS

- A. Paving asphalt and emulsified asphalt shall conform to current specifications of The Asphalt Institute for the grade specified, however, no tests will be required if obtained from a supplier whose products are acceptable on State and/or Federal Highway paving projects.
- B. No tests will be required of aggregates for asphaltic concrete provided these materials are obtained from sources and processed by plants, or by methods, all of which are acceptable by the public contracting bodies in the area.

2C-08

SMOOTHNESS

Upon completion, the pavement shall be true to grade and cross section. Except at changes of grade, when a 10-foot straight-edge is laid on the finished surface, the surface shall not vary from the edge of the straightedge more than 1/4 inch. Any areas that are not within this tolerance shall be brought to grade immediately following the initial compacting. If so directed, flood tests will be required and any areas where water puddles or stands shall be cut out and refilled and compacted as directed.

- END -

SECTION 2D

SLURRY WALL

Requirements of Division 1 apply to work of this Section.

2D-01 SCOPE

Provide slurry walls and other work specified and indicated, complete.

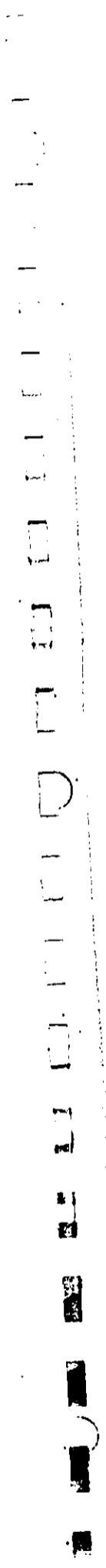
2D-02 SLURRY WALL

Slurry Wall: Slurry wall shall serve as both construction bulkhead, to allow excavation for building to be made while retaining surrounding earth and adjacent streets and buildings, and to serve as portions of final building basement wall. Completed bulkhead shall be watertight, without voids, honeycomb or loose material. Defects shall be repaired in a manner to prevent inflow of water.

- A. Slurry wall is a concrete wall cast in an earth trench without side forms in segments excavated between soldier beams set in prebored holes. A slurry of powdered bentonite in water is placed in holes and slot excavations to prevent caving of soil. Tremie placed concrete shall be placed from bottom of excavation to displace slurry.
- B. Structural building columns shall be placed in slurry filled trenches between soldier beams with great care and accuracy to insure their proper location to receive continuation of structural columns under another section of specification. Soldier beams shall be placed with sufficient accuracy to permit structural building columns to be placed with the following tolerances:
 1. Top of wall column to be minus 0" plus 1" from design location.
 2. Center line of wall columns, at their tops, to be plus or minus 3/4" from design centerline along wall and 1/4" in and 3/4" out from design centerline perpendicular to wall.

3. Maximum slope of wall columns shall be held to 1 part in 120 parts.
- C. Bracing of wall system may be bracing across the site or "Tie back" anchors.

- END -



SECTION 3A

CONCRETE FORMS

Requirements of Division 1 apply to this Section.

3A-01 SCOPE

Provide, install and remove all forms for poured-in-place concrete, including all shoring and form supports.

3A-02 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete Reinforcing.
- B. Concrete, Poured-In-Place.
- C. Forms for precast concrete: See Concrete, Precast.
- D. Cement Finishing.

3A-03 SHOP DRAWINGS

Submit showing typical jointing, form tie pattern, joint lines and locations, details and materials for forms and shoring.

3A-04 MATERIALS

- A. Form Lumber:
 - 1. For Exposed Concrete Not Otherwise Noted: DFPA graded Plyform, Grade B-B, exterior, each piece grade marked, no mill oiling permitted. Conform to American Plywood Assn. "Guide to Plywood for Concrete Forms", U.S. Product Standard PS 1-66, Class I.
 - 2. Chamfer Strips, Reveals, and Score Marks: Clear Douglas Fir, selected straight, milled on all faces to shapes and sizes shown on drawings.
 - 3. Unexposed Concrete Not Otherwise Specified: Of design and strength to hold concrete in place and alignment.
 - 4. Framing: Douglas Fir, "Construction" grade or better.

- B. Metal Forms: Conformation to "Simplified Practice Recommendation R 87-32".
- C. Form Coatings:
 - 1. Chemically Active Type Producing Water-Insoluble Soaps: Burke "Noxcrete", or approved equal. Form coatings shall be delivered in manufacturer's sealed and trademarked containers and shall be guaranteed to provide clean, stain-free concrete release and not to interfere with future applied coatings and finishes. Coatings shall contain no petroleum solvents such as cresote, paraffin, waxes or diesel oil.
 - 2. Form oils are not permitted.
- D. Form Ties: Metal bolt or rod type acting as spreaders and leaving no metal within 1-inch of concrete face. Snap ties, if used, must be as approved by Architect. No wire ties permitted.

3A-05

WORKMANSHIP

- A. General: Comply with applicable requirements of ACI 347-63, except as otherwise noted or indicated.
- B. Vertical and Horizontal Controls: Establish and maintain all necessary benchmarks, lines, or controls throughout construction. Forms and shoring shall be to final elevations compatible with finished floor elevations and form material.
- C. Tolerances: Design, construct, set, and maintain formwork to insure completed work within tolerance limits specified in ACI 347-63. See Cement Finishing and Curing section for slab tolerances.
- D. Thoroughly clean forms and re-coat with form coating before each re-use. Do not re-use any form which cannot be conditioned to "like new" condition. Discard forms considered unsatisfactory by Architect or his representative. Apply all form coatings before placing reinforcing steel.
- E. Fabrication:

1. Conform to concrete details, dimensions, tolerances, and alignments indicated on drawings and to approved shop drawings.
2. Construct wood forms of sound lumber, straight and rigid, and braced. Form strength shall be sufficient so that pressure of concrete and the movement of men and equipment will not displace them. Space studs at 16" maximum c-c for 1x boards or 3/4" plywood and 12" maximum c-c for 5/8" plywood. Forms shall not deflect excessively when filled with wet concrete. Visible waves in concrete surface after stripping of forms will result in rejection of that portion of concrete.
3. Make joints in plywood forms sufficiently tight to prevent leakage of mortar.
4. Construct forms no higher than 12" above top of a pour or construction joint.
5. Provide coating on all forms.
6. Camber forms for beams and girders as indicated.
7. Make side forms of beams and girders removable without disturbing soffits or shores.
8. Uniformly space all form ties. Spacers shall not project through exposed concrete surfaces.
9. Provide cleanouts along bottom of walls and columns or elsewhere as required to permit effective cleaning of all loose dirt, debris, and waste material.
10. Chamfer corners and edges except where indicated on drawings. Obtain chamfers by placing 3/4" x 3/4" (unless noted otherwise) non-staining moldings in forms. Pieces shall be in longest lengths possible and all joints shall be mitered. Match surface texture of adjacent concrete.
11. Arrange forms to allow proper erection sequence and to permit form removal without damage to concrete.
12. Secure information and provide for all openings, sleeves, chases, reglets, pipes, recesses, nailers, anchors, ties, inserts, and all other items before pouring. Do not space sleeves closer than 3 times sleeve or opening dimen-

sion and not less than 6" o.c. for small sleeves. Do not place sleeves through beams or girders without prior written approval.

13. Do not embed piping, other than electrical conduit, in structural concrete, unless otherwise indicated on the drawings. Increase thickness of concrete so that conduit does not exceed 30% of concrete thickness. Do not allow conduit to be placed below bottom layer of reinforcing steel.
14. Prior to pouring, remove all dirt, debris, and water, from forms. Leave no wood in concrete except nailers.
15. For architectural concrete surfaces not otherwise shown, make form tie spacing and plywood pattern regular and symmetrical, joints plumb and level.
16. Provide a surfaced pouring strip where construction joints intersect exposed plywood formed surfaces to provide straight line at joints. Just prior to consequent pour, remove strip and tighten forms to conceal shrinkage.

3A-06

REMOVAL OF FORMS AND SHORING AND RESHORING

- A. Do not remove any shoring or supports until permission is obtained from the Designer. . Removal of forms shall be carried out in such manner as will insure complete safety of the structure and to avoid damage to concrete surfaces. Conform to following:

Wall Forms and Beam Sides Except as Specified:	3 days
Column Forms:	4 days
Forms for all Soffits and Beam Bottoms But Not Shoring:	10 days

Leave shoring in place until 14 days after placing concrete two slabs above; i.e., leave shoring supporting 1st level in place until 14 days after 3rd level slab and beam system is placed, at which time shoring supporting 1st level may be removed.

- END -

SECTION 3B

CONCRETE REINFORCING

Requirements of Division 1 apply to this Section.

3B-01 SCOPE

Provide all reinforcing steel work as indicated and specified, complete.

3B-02 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Concrete Forms.
- B. Concrete, Poured-In-Place.
- C. Reinforcing steel for precast concrete: See Concrete, Precast.

3B-03 SHOP DRAWINGS

See "Shop Drawings & Samples" section for shop drawing requirements; work shall conform thereto.

3B-04 MATERIALS

- A. Reinforcing steel: Conform to ASTM Designation A615-68 Grade 40, and Grade 60 where noted. Bars 1/4" size need not be deformed.
- B. Column Spirals: Cold-drawn steel wire, ASTM A 82-66. gauge as noted.
- C. Welding Electrodes: ASTM A 233-64T, E70 Series, low hydrogen, minimum 60,000 psi yield point, delivered in hermetically-sealed labeled containers.
- D. Accessories: Galvanized chairs and accessories, except approved all-plastic or plastic-tipped only for use where concrete remains exposed. Use premolded plastic tips only; dipped or sprayed plastic coating is not acceptable. Submit samples of each type of accessory for approval, including plastic tips if used.
- E. Tie Wire: Annealed steel tie wire, minimum 16 gauge.

- F. Reinforcing Mesh: ASTM A 185-68 except tensile strength may be reduced to 60,000 psi, mesh and gauge as shown or noted.

3B-05 TESTS AND INSPECTIONS

Provide all tests and inspections per requirements of Section 1C, "Tests and Inspections". Material tests and continuous inspections of welding required.

3B-06 WELDING

- A. Perform welding, where indicated or approved, by direct electric arc process, with thoroughly trained and experienced certified operators. All welding shall conform to latest edition of American Welding Society "Code for Arc and Gas Welding in Building Construction" and to AWS D12.1.
- B. Preparation: Clean surfaces to be welded of loose scale and foreign material. Clean welds each time electrode is changed. Chip burned or flamecut edges clean before welds are deposited.
- C. Characteristics of Welds: When brushed with wire brushes, completed welds must exhibit uniform section, smoothness of welded metal, feather edges without undercuts or overlays, freedom from porosity and clinkers, and good fusion with penetration into base metal. Cut out welds or parts of welds found defective with chisel and replace.

3B-07 FABRICATION AND DELIVERY

- A. Bending and Forming: Fabricate bars of indicated size and accurately form to shapes and lengths indicated and required, by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not scheduled will be rejected.
- B. Column Spirals: Unless otherwise shown, complete ends of spirals with not less than 1-1/2 turns.
- C. Marking and Shipping: Bundle reinforcement and tag with suitable identification to facilitate sorting and placing, and transport and store at site so as not to damage material. Keep sufficient supply of tested, approved, and proper reinforcement at site to avoid delays. Maintain reinforcing free of mud, dirt, grease, or other coatings.

PLACING

- A. Coordinate with other trades, and expedite materials and labor to avoid omissions and delay. Provide specified additional reinforcing bars at sleeves and openings.
- B. Cleaning: Before placing, and again before concrete is placed, clean reinforcement of loose mill scale, oil, or other coatings that might destroy or reduce bond.
- C. Securing in Place: Accurately place reinforcement and securely wire tie in precise position at points where bars cross. Tie stirrups to bars at both top and bottom. Bend wire ties away from forms; exercise special care to keep re-bar and tie wires completely embedded in concrete. Support horizontal bars in strict accordance with "Recommended Practice for Placing Bar Supports", 1963 edition, published by Concrete Reinforcing Steel Institute, using approved accessories and chairs to prevent displacement under weight of workmen.
- D. Spacing of Reinforcement: Exercise particular care to maintain proper distance and clearance between parallel bars and between bars and forms. Provide metal spreaders and spacers to hold steel in position as necessary. Use precast concrete cubes to support reinforcing steel and mesh in concrete placed on earth and in footings. Support steel at proper height upon approved chairs, transverse steel bars with hangers, or in other manner, as necessary and approved.
- E. Minimum Clear Distances between reinforcing steel and face of concrete as indicated on drawings.
- F. Splices: Do not make splices at points of maximum stress except where indicated. Where made, lap as indicated or necessary to develop full strength or stress of bars. Maintain clear spacing between parallel bars of not less than 1-1/2 times bar diameter for round bars, but in no case less than 1-1/2" nor less than 1-1/3 times maximum size aggregate. Stagger top splices, and in horizontal wall reinforcement separate at least 1 foot longitudinally in alternate bars of opposite tiers. Extend stubs and dowels, required to receive and engage subsequent work, a sufficient length to develop full strength of bar or as indicated. Place dowel and stub bars in forms and secure against displacement during concrete placing. Clean off adhering concrete immediately after completion of pour while encrustations are soft.

- G. Floor and Roof System Reinforcement: Do not place in floor slabs, or beams until concrete in walls and columns below is placed, and forms and projecting steel are thoroughly cleaned.
- H. Mesh Reinforcing: Sizes and gauges shown, lapped one full mesh at splices and wire tied.
- I. Additional Reinforcing Bars: Where reinforcement is interrupted by sleeves and openings, provide additional bars as shown or required to maintain total reinforcement. Where this requirement cannot be complied with, submit details for approval before proceeding. Provide required additional reinforcing at no extra cost to Owner.
- J. Concrete Pours: At each location during concrete placing, assign a competent mechanic to inspect reinforcement and maintain bars in proper positions.
- K. Approval: Obtain inspection and approval of reinforcing, including location of splices, before concrete is placed.

- END -

SECTION 3C
CONCRETE, POURED-IN-PLACE

Requirements of Division 1 apply to work of this Section.

3C-01 SCOPE

Provide all plain and reinforced poured-in-place concrete as indicated and specified, complete.

3C-02 WORK INCLUDED IN THIS SECTION

- A. All regular weight and light weight poured-in-place concrete.
- B. Curing of formed concrete.
- C. Placing Reinforcement Dowels.

3C-03 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Concrete Forms.
- B. Concrete Reinforcing.
- C. Patching, cement finishing and curing including slab toppings (except curing of formed concrete): See Cement Finishing.
- D. Excavation.
- E. Structural steel accessories including anchor bolts and grouting of base plates: See Structural Steel.
- F. Metal Decking.
- G. Concrete, Precast.
- H. Waterproof membranes: See Built-Up Roofing and Waterproof Membranes.
- I. Painting.
- J. Calking and Sealants.

3C-03

GENERAL

- A. Pouring Schedule: Submit for approval, details and sketches showing location of each proposed construction joint, and schedule of anticipated pouring date for each portion of structure.
- B. Records: Maintain an accurate record showing date and time of concrete placement in each portion of structure. Correlate placing record to record for test cylinders. Maintain a separate record giving dates of removal of forms, shoring including first and second halves, and re-shoring if used. Keep records available for inspection at site. Upon completion, deliver two copies of each to Designer, in approved form.
- C. Protection: Take every precaution and provide suitable means to protect finished work from damage, stains, abrasion, or injurious action of sun or weather. Protect fresh concrete from rain and flowing water.
- D. Defective Work: At Contractor's expense, remove defective material and faulty workmanship as determined by Designer, work not formed as indicated, or not true to alignment, or not plumb or level, or not true to grades, slopes and levels, or that has voids or rock pockets, or has sawdust, wood, or debris embedded in it, or does not meet test requirements, or does not conform to approved samples, and replace with work that conforms with indicated and specified requirements, as approved.

3C-04

MATERIALS

- A. Portland Cement: ASTM C 150-68, Type II, low alkali. Do not change brand or color during progress of work without prior written approval. "Ideal" brand.
- B. Conventional Stone Aggregates: Washed, conforming to ASTM C 33-67 from sources approved by California State Highway Department. Do not change sources without prior written approval. Conform to ASTM E 11-61 for square-mesh grading sieves. For coarse aggregate, use washed river gravel only for concrete to remain exposed and unpainted. Use maximum 1-1/2" size in footings only; elsewhere use maximum 3/4" size. Following table indicates required combination of fine and coarse aggregates, when particles are reasonably uniform in grading and coarse aggregates are of a general rounded nature.

Sieve Number or Size in Inches	1-1/2" Max.	Percent Passing (by Weight)	
		1" Max.	3/4" Max.
2 inch	--	--	--
1-1/2 inch	95-100	--	--
1-inch	75- 90	90-100	--
3/4-inch	55- 77	70- 90	90-100
3/8-inch	40- 55	45- 65	60- 80
No. 4	30- 40	31- 47	40- 60
No. 8	22- 35	23- 40	30- 45
No. 16	16- 30	17- 35	20- 35
No. 30	10- 30	12- 23	13- 23
No. 50	2- 8	2- 10	5- 15
No. 100	0- 3	0- 3	0- 5

C. Quality of Stone Aggregates: In addition to requirements:

1. Sieve Analysis: ASTM C 136-67.
2. Organic Impurities: ASTM C 40-66. For fine aggregate, developed color not darker than reference standard color.
3. Soundness: ASTM C 88-63. Loss after 5 cycles not to exceed 8% for coarse or 10% for fine aggregate.
4. Abrasion of Concrete Aggregate: ASTM C 131-66. Loss not to exceed 10-1/2% after 100 revolutions, or 42% after 500 revolutions.
5. Deleterious Materials: Follow requirements of ASTM C 33-67.
6. Materials Passing No. 200 Sieve: ASTM C 117-67.
7. Exception: Soundness and abrasion tests will be waived if supplier has current laboratory test results on aggregate.

D. Lightweight Concrete:

1. Lightweight Aggregates shall be Basalite Aggregate, ASTM E 330-68T, graded from fine to 5/8" maximum.
2. Lightweight Concrete shall have a maximum plastic weight of 110 pcf.

3. Maximum Slump shall be 3". Minimum compressive strength at 28 days for concrete fill on metal deck and for concrete suspended slabs shall 3,000 psi.

- E. Admixture: Plastiment. Retarders, accelerators, or air-entraining agents may be approved if included in mix design as specified elsewhere. If entrained air is shown in mix design provide continuous control by laboratory during pouring to assure that correct percentage of air is maintained throughout the whole pour.
- F. Water: Clean, potable, and from an approved source.
- G. Premolded Expansion Joints: ASTM D 994-53, preformed asphaltic compound strips as approved, 1/4" thick unless otherwise noted.
- H. Non-Shrink Grout: Master Builders Co. "Embeco", or approved equal. Use a non-staining grout where exposed.
- I. Lampblack: (Concrete Color) Tricosal "Liquiblack", Grace "E. Dispersed Black", or approved equal, carbon black solution especially prepared for concrete use.
- J. Waterstops: Polyvinylchloride type meeting Corps of Engineers Spec. CRD-C-572, ribbed or dumbbell, length as shown on drawings, 3/8" min. thickness.

3C-05 MIX DESIGNS AND PRELIMINARY TESTS

As set forth in Section 1C "Tests and Inspections".

3C-06 TESTS OF CONCRETE MATERIALS AND CONCRETE

As set forth in Section 1C "Tests and Inspections".

3C-07 BATCH PLANT AND CONCRETE MIXING

- A. Furnish concrete from recognized commercial ready-mix concrete plant conforming to ASTM C 94-68. Concrete manufacturer shall certify in writing that Portland Cement and aggregates conform to requirements specified under "Materials".
- B. Concrete Mixers: Truck Mixers conforming to ASTM C 94-68. minimum 2 cubic yard capacity. Operate mixers at manufacturer's rated mixing speed. Replace mixing blades worn down over 10%. Discontinue use of any mixer not producing

satisfactory concrete, or whenever test samples taken from front, center and back of mixer show a difference of more than 10% in sand-cement or water-cement ratio. Equip truck mixers with an accurate revolution counter.

- C. Mixing Time: For truck mixers, total mixing time of at least 15 minutes, with at least 5 minutes immediately after adding water and at least 1 minute just before discharging; when necessary or ordered for proper control, perform mixing at site without use of transit-mixing.
- D. Mixing Water: Withhold 2-1/2 gallons per cubic yard from predetermined water content when batching from ready-mix plant. All or part may be added at site, when directed.
- E. Retempered Concrete: Do not use concrete that has stood for over 30 minutes after leaving mixer, or concrete that is not placed in less than 90 minutes after water is introduced.

3C-08 REINFORCING STEEL & MESH

- A. Coordinate installation of reinforcing steel bars and reinforcing mesh provided under Concrete Reinforcing section.
- B. Clean bars extending through construction joints of concrete while incrustations are soft.
- C. Mesh Reinforcing: Maintain at proper elevation during pouring of concrete.

3C-09 PREPARATION FOR CONCRETE PLACING

- A. Debris: Remove foreign matter in forms, and rigidly close ports and openings left in formwork.
- B. Reinforcement: Clean embedded metal of old mortar, oils, mill scale, and other encrustations or coatings that might reduce bond.
- C. Wetting: Wet wood forms sufficiently to tighten up cracks. Wet other materials sufficiently to reduce suction and maintain concrete workability.
- D. Equipment: Thoroughly clean tools before and after each use.

- E. Earth Subgrade: Lightly dampen sand backfill 24 hours in advance of concrete placing. Do not puddle. Re-roll where necessary for smoothness and remove all loose material. Where porous or highly absorptive sub-grade or earth banks occur, cover with vapor barrier sheeting to prevent excess suction.

3C-10

CONCRETE PLACING

- A. Inspection and Approval: Obtain approval for preparation, forms, reinforcing, embedded items, and placing equipment before placing concrete.
- B. Conveying:
1. Rapid Handling: Handle concrete from mixer to location of placing rapidly, avoiding separation or loss of ingredients and rehandling.
 2. Transporting Methods: Use buckets, carts, wheelbarrows, or buggies to deliver concrete to location of placing. Do not use pipes, pumping, troughs, belts, chain buckets, or sluices to transport concrete after leaving mixer spout without prior approval. Do not support runways on reinforcing.
 3. Tremies: Use elephant trunk spouts for placing concrete in vertical elements. Space at not over 10-foot centers. Do not exceed 6-foot free fall.
- C. Placing and Compacting Beams, Slabs, Columns:
1. Modified Mixture: At bottom of vertical elements, and wherever reinforcement is congested or space is inadequate for compacting, use cement grout consisting of regular concrete with 50% of coarse aggregate omitted. Place to 3" thickness for vertical elements, and in any case, place not over 20 minutes before balance of pour is made.
 2. Place concrete with level surface and without flow along forms. In walls and columns, do not pour at rate that causes deflection. Place concrete continuously in each section or panel, and for full height of each column. Horizontal cold joints are not permitted in columns, except at intersection with beams.

3. Thoroughly compact with spading, rodding, and internal high-frequency vibration. Use at least one vibrator at each pouring location and maintain extra standby vibrators readily available. Continue compaction to insure exclusion of rock pockets, air bubbles, and honeycomb, but do not leave vibrators in one spot over 30 seconds or cause segregation. Exercise constant control and care to insure uniform and complete vibration and compaction of exposed concrete.
4. Beam and Slab: Place concrete in beam sections first, to level of top of beam forms, and compact concrete as specified. Remove excess water and laitance. Before concrete obtains initial set and is still plastic, place concrete for slabs and balance of beam, and again compact.
5. Slabs: Maintain reinforcing and mesh at proper elevation. Set accurate screeds and float slabs to indicated levels or slopes. Compact with vibration. Provide depressed slabs where shown.

D. Placing and Compacting for Mat Foundation:

1. Submit to Designer concrete placement procedure and approximate rate of pour (cubic yards per hour) anticipated for approval 48 hours prior to concrete pour.
2. Owing to large mass concrete to be poured, constant effort shall be maintained to prevent cold joints between successive pour layers. Primary objective in placement of concrete in mat shall be to pour homogeneous, well consolidated concrete mass without cleavage or cold planes in any direction except at predetermined points. Advance planning shall be given to pouring sequence, use of adequate number of experienced workmen, concrete temperature, and thorough compaction.
3. Each layer shall be placed level and in uniform layers of 1'-6" and followed by vibrators inserted vertically and dropped by its own weight to a minimum of approximately 1-1/2 layers (2'-6") total (or penetrate into previous layer approximately 1/2 of its depth). Rate of pour is approximated at between 30 to 40 cubic yards per hour. Elapsed time between initial pour and subsequent revibration of previous layer is approximated at 3 hours. Maximum elapsed

time for revibration of previous layer shall be 4 hours without addition of retarding agent in concrete mix. If pouring rate cannot fulfill above assumptions, retarding agent shall be incorporated in concrete mix by testing laboratory). Vibrators shall be inserted in a pattern approximately 30 inches in each direction and held for about 20 seconds after which they shall be withdrawn slowly.

4. Standby equipment for conveyance of concrete to discharge points shall be maintained at all times. Continuous, uninterrupted pouring operation shall be maintained until particular pour is finished.
5. Adequate adjustable platforms shall be provided for workmen to perform efficiently during pouring operation.
6. Height marks on inside face of forms shall be placed in order to provide gage for thickness of successive pour layers.
7. Any or all reinforcement which have been displaced for convenience of pouring operation shall be replaced and tied in place before concrete is placed.

3C-11

CONSTRUCTION AND EXPANSION JOINTS

A. Location: In conformance with approved details and sketches.

1. Horizontal Joints in Walls: Remove excess water and laitance from concrete surface. Just before placing additional concrete, dampen previously placed concrete with water and cover surface with modified mix as specified.
2. Vertical Joints in Walls: Make vertical joints with mortar tight dam and beveled key in center of wall. Stagger joints at least one bay between subsequent placing. Leave flow surfaces of freshly packed concrete level wherever placing of concrete is stopped.
3. Joints in Slabs: Make construction joints in supported slabs only in middle third, in either direction of spans. Do not make construction joints continuous for more than 60 percent of overall building dimensions in either direction. Offset construction joints not less

than 5 feet. Allow minimum 5-day time lapse in placing floor sections joining prior placings, as approved. In slabs on grade, make construction joints as detailed, or approved equal, located as approved; pour slabs on grade in checkerboard pattern, each area not exceeding 900 square feet, with at least 5-day interval between pouring of adjacent sections.

- B. Contact Surfaces: Keep exposed face of construction joints continuously moist from time of initial set until subsequent concrete placing or end of curing period. Clean contact surfaces by thorough chipping or sand blasting. If contact surface becomes coated with foreign materials of any nature after being cleaned, chip or re-chip surface to suitable condition.
- C. Option: Slabs on grade may be poured in continuous strips, and saw cut 1" deep as approved on next day.

3C-12 CURING FORMED CONCRETE

Keep forms containing concrete thoroughly wet, including tops and exposed portions of concrete, until forms are removed and exposed concrete after form removal for not less than 14 days from time of placing concrete. Continuously wet concrete between hours of 8:00 A.M. and sunset each day, including Saturday, Sundays, and holidays, for first 10 days, and not less than 3 times daily for remaining 4 days.

3C-13 EQUIPMENT BASES

Provide concrete bases and anchorages for mechanical and electrical work, and other work as required and indicated on drawings and approved shop drawings of related trades.

3C-14 CONCRETE CURBS, ETC.

All concrete curbs, gutters, aprons and walks indicated shall be constructed of concrete as part of this Section in accordance with local ordinances having jurisdiction. Work in public property shall conform to requirements of City and County of San Francisco.

3C-15

GROUTING

Perform all indicated and required grouting, except grouting specified as work of other Sections. Use grout material as specified for patchings, including non-shrink grout material, and install by dry-pack method unless rodding and puddling is approved. Finish exposed grout to match adjoining surfaces.

- END -

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SECTION 3D
CEMENT FINISHING

Requirements of Division 1 apply to work of this Section.

3D-01 SCOPE

All cement finish required on exposed poured-in-place concrete surfaces including all toppings, patching and all curing of concrete (except formed surfaces.)

3D-02 RELATED WORK SPECIFIED ELSEWHERE

- A. Curing of formed concrete: See Concrete, Poured-In-Place.
- B. Precast concrete (including curing and finish). See Concrete, Precast.
- C. Calking and Sealants
- D. Painting

3D-03 MATERIALS

- A. Curing Materials:
 - 1. Curing Paper: ASIM C-171-68, Type I or II, non-staining.
 - 2. Curing Compounds: ASIM C-309-58, Type I or II, approved resin type free of oil, wax, grease or other substance which might prove deleterious to any material to be applied to concrete.
- B. Hardener: Sonneborn "Lapidolith", Horn "Hornolith", or approved equal.
- C. Metal Divider Strips: American Terrazzo Strip Co., Manhattan Co., Ridel, or approved equal, 12 ga. B & S zinc alloy by depths required to secure positive embedment in concrete.
- D. Slab Topping: Conform to requirements of Concrete Poured-In-Place Section for cement, aggregates (lightweight), admixtures and water. Conform to ASTM C-68T for grading of aggregates except that material passing No. 30 sieve shall vary from 25-65 percent. Slump shall not exceed 3".

See Drawings and Specifications for required strengths. Mix designs shall be Contractor designed as specified in Concrete, Poured-In-Place Section and in Section 1C "Tests and Inspections".

3D-04

CURING

- A. All concrete shall be cured by water curing, curing paper or curing compound, all as specified.
- B. Curing compound shall be used only when specifically approved by Architect, and shall not be used on surfaces when its use may be detrimental to bonding of concrete, caulking or sealants, or specified surface finish. Curing compounds will not be permitted on surfaces to receive paint, adhesive applied finishes and composition plastic flooring.
- C. Curing Compound - General:
 - 1. Apply immediately following completion of specified finishing.
 - 2. When applying compound, surfaces may be wet but shall be swept free from standing water, or, if surfaces have dried, surfaces shall be dampened just prior to application.
 - 3. Cover surfaces with uniform and even film of compound, as supplied. Using pressurized spray equipment, apply in single coat application to achieve total coverage as recommended by manufacturer.
 - 4. When curing compound is applied inside enclosed spaces, adequate mechanical ventilation shall be provided and maintained throughout periods of application.
- D. Other concrete not otherwise permitted to be cured by curing compound shall be water cured as specified for minimum of 14 days, except that all above grade concrete floor slabs shall be paper cured as specified below.
- E. Water Curing:
 - 1. Concrete surfaces shall be kept wet by fog spray system, as approved by Structural Engineer, which will keep all surfaces continuously (not periodically) wet.
 - 2. Curing water shall be clean and potable.

3. Curing water run-off shall be drained and wasted in approved manner. Provide pumps, temporary drain lines and other equipment necessary to waste curing water and prevent damage and stains to building and related improvements and property of others.

F. Paper Curing:

1. Cure all above grade slabs using curing paper.
2. All slabs shall be dampened so that free moisture occurs over entire area.
3. After dampening, slabs shall be immediately covered with curing paper lapped 4" at all joints and sealed with adhesive tapes or waterproof glue. Curing paper shall remain in place for not less than 14 calendar days. During curing period scuffed or torn areas shall be promptly recovered with additional papers. Do not use any curing papers which contain a thread design that may leave an impressed pattern on slab.

3D-05

PATCHING

- A. Within 3 days after stripping formwork, all surface defects such as rock pockets, honeycombs, foreign materials, cracks and holes shall be filled and patched. Designer shall distinguish between defective concrete which requires replacement or repair of surface defects which require patching.
- B. Surfaces which are to receive waterproof membrane shall have fins and loose material removed, and voids and cracks patched.
- C. Areas to be patched shall have all loose material chipped away and shall be thoroughly wetted for at least 6" entirely surrounding the patch. Patching shall be prepared of same material and proportions as used for concrete, except remove coarse aggregate. Where exposed concrete is to remain unpainted, trial patch using combination of white and grey cement shall be allowed to set up in order to verify that patching grout will match color and texture of adjacent concrete surface. Keep water in mix to minimum. Do not re-temper grout by adding water. Grout shall be allowed to stand for one hour prior to use and shall be mixed to prevent setting. Grout shall be compacted thoroughly into place and screeded to leave patch slightly higher than

surrounding surfaces then left undisturbed for two hours to permit initial shrinkage. Patch shall then be finished to match adjacent surfaces in texture and pattern.

- D. Fill form tie holes solidly with grout. For holes passing entirely through walls, use plunger type "grease gun" or other suitable device and completely fill holes.

3D-06

TOPPING

Rough up all smooth concrete surfaces using chipping hammers, sandblasting or similar devices and "V" out all cracks. Remove all oil, grease, asphalt and other coatings which would interfere with bond. Saturate all base slabs with water just prior to placing topping and sweep all excess water from damp surfaces. Broom in thin coat of neat cement grout for short distance ahead of topping and place topping mix before grout has hardened. Strike off topping mix to required levels (using screeds as necessary to maintain tolerances) and compact using rollers, vibrators and tampers. Do not overvibrate as this will cause coarse aggregate to come to surface). Float surface ready for specified finishes using magnesium or aluminum floats.

3D-07

FINISHING

A. Formed Surfaces - Interior and Exterior:

1. Typical Unless Noted Otherwise: Fins removed and patched only with no special requirements for finishing.

B. Interior Slabs:

1. Finish slabs monolithically. Uniformly slope floor slabs to provide positive draining of indicated areas. Special care shall be taken that a smooth, even joint is obtained between successive pours.
2. Tolerance for exposed concrete slabs and slabs to receive carpet and composition plastic flooring: 1/8" in 8 ft. with maximum high and low variance not occurring in less than 16 ft. and with 1/16" tolerance in any one running foot.
3. Tolerance for slabs to receive resilient flooring: 1/8" in 10 ft. with maximum high and low variance not occurring in less than 20 ft. and with 1/16" tolerance in any one running foot.

4. Tolerance for slabs to receive ceramic tile: 1/2" in 10 ft.
5. Float Finish Typical for Slabs to Receive Setting Beds, Waterproof Membranes, Etc.): Surface of slab shall be screeded to finish subfloor grade and all surface water and laitance removed. Start floating soon as screeded surface has stiffened sufficiently. Floating shall be performed by hand using wood float and shall be minimum necessary to produce smooth, level, even-textured surface.
6. Trowel Finish (Typical Under Resilient Floors, Carpeting, Composition Plastic Flooring, and All Other Areas Not Specifically Noted): After concrete slab has been screeded to finish grade and float finished as above specified, floating shall be followed by steel troweling after concrete has hardened sufficiently to prevent excess fine material from working to surface. Finish shall be brought to smooth uniform surface free from defects and blemishes. No dry cement or mixture of dry cement and sand shall be sprinkled on surface.
7. Surface Hardener: All exposed interior concrete slabs in building service and housekeeping areas (including mechanical rooms and areas) shall receive 3 applications of concrete floor hardener. Strength of solution and rate of application shall be per manufacturer's recommendation. Solution shall be applied with brooms or mops; allow to dry completely between applications. After last application has dried, surface shall be brushed and washed with water to remove all crystals which have formed on surface.
8. Non-Slip Finish: Traffic Surface of loading docks, stairs, landings, ramps, and elsewhere as indicated, shall be given dust-on application of silicone carbide or aluminum oxide crystals. Finish with steel trowel but avoid over-trowelling. Rate of application of abrasive shall be not less than 30-pounds per 100 square feet. Application shall be in accordance with manufacturer's recommendations.

3D-08 METAL DIVIDER STRIPS

Provide metal divider strips where indicated. Set strips so that top edge will be exactly level with adjacent flooring materials, securely fastened in place and protect with temporary wood blocking or shoring until finishes are complete.

3D-09 DEFECTIVE WORK

Cement finish which is not true to line and plane, which is not in conformance with specified finish requirements, which exceeds specified tolerances, which does not properly connect to adjoining work, which does not slope to drain and which has been improperly cured, will be deemed as defective.

All defective work shall be removed and replaced with proper work meeting drawing and specification requirements and at no added cost to the Owner.

3D-10 PROTECTION

Protect exposed surfaces including flatwork with full board or plywood coverings, or other similar protection as approved, as required to protect work from damage by impact or stains from rubbish and work of other trades.

- END -

SECTION 3E

CONCRETE, PRECAST

Requirements of Division 1 apply to work of this Section.

3E-01 SCOPE

Provide all precast concrete work complete as indicated and specified, except as hereinafter specifically excluded from work of this section.

3E-02 WORK INCLUDED IN THIS SECTION

- A. Fabrication, delivery and erection of following precast members:
 - 1. Column covers and beam spandrels.
 - 2. Wall panels.
 - 3. Other precast concrete members designated or required, except as specifically excluded.
- B. Furnishing and installing all reinforcing and anchorage devices incidental to work of this Section in order to facilitate handling, erection, shimming and secure permanent attachment, except furnish only with setting instructions those items incidental to this work which are embedded in job site poured-in-place concrete work.
- C. Placing items provided by other trades for embedment in work of this Section.
- D. All grouting, caulking and sealing of work of this Section, complete with premolded joint backup fillers and drains.
- E. Samples, approved shop and erection drawings, and Engineer's approved calculations for additional reinforcement, inserts and attachments necessary for lifting and handling.
- F. Cleaning and repairing, including, on reimbursable rate by other trades, cleaning and repairing of any damage or staining of this work by other trades.
- G. Participation in erection, coordination and payment of prorated expenses for weather testing, at precast manufac-

turer's yard, of a complete typical Tower window opening consisting of incidental work of this Section, aluminum, glass, glazing, caulking and sealing work.

H. Coordination and cooperation.

3E-03

WORK NOT INCLUDED IN THIS SECTION

- A. All poured-in-place concrete work, except grouting and dry packing incidental to work of this Section.
- B. Installation of anchorage devices furnished under this Precast Concrete Section and embedded in work of other trades (Pertinent Sections):
- C. Furnishing of items incidental to work of other trades which are embedded in precast concrete units (Pertinent Sections).
- D. Provision and/or application of any insulation or vapor barrier material.
- E. Window frames, sash, glazing, louvers, grilles, and other similar items and installation and weatherproofing of those items.

3E-04

MANUFACTURER

- A. Perform work of this Section by manufacturer thoroughly trained and experienced in production of precast concrete elements having designated and specified qualities of structural strength, density, finishes, weather-tightness, dimensional stability and accuracy. Manufacturer shall have adequate finances, plant, storage, equipment, all skilled personnel available to expeditiously and competently fabricate and erect the work of this Section.
- B. Before bidding, manufacturer shall obtain from Designer in writing, an approval of his product by samples and be prepared to demonstrate past satisfactory completion of work of comparable magnitude, concept, and purpose.

3E-05

SHOP DRAWINGS AND ERECTION DIAGRAMS

Prepare complete shop drawings, erection diagrams, and calculations for work of this Section. Those necessary shall be approved by governing Building Department Authorities prior to submittal for Designer's approval and prior to fabrication. Base drawings on details and dimensions verified at site and in

cooperation with other trades. Drawings shall show: size, shape, and finish of each type unit; number, type and locations of all attachments and anchors; joint spacing and types; method of lifting, setting, handling units. Prior to fabrication, submit complete shop drawings and diagrams to Designer for approval.

3E-06 FINISHES

In respective designated locations, all precast elements shall uniformly match Designer's selected and approved samples to provide finishes designated.

3E-07 SAMPLES

Prior to production of work of this Section, manufacturer shall submit to Designer and obtain his approval of a set of three samples of each finish which are representative of the actual elements as to quality and type of finish. Also, at start of production, a full size member shall be approved by the Designer as to actual standard for further production of each member and respective finish. Completed work shall uniformly match approved samples.

3E-08 TESTING AND INSPECTION

- A. At Contractor's expense, for work of this Section perform material testing and inspections as per applicable requirements of Code authorities and ASTM standards.
- B. Make minimum of 3 test cylinders during each day's production of the elements to verify strength and uniformity of concrete. Casting and curing of these test cylinders shall be in accordance with actual production of elements consistent with recognized laboratory procedures.
- C. Provide, at Contractor's expense, continuous inspections of all field installations using welding or high strength bolted structural connections. Use services of Owner and Designer approved inspectors.
- D. At manufacturer's plant, in fully coordinated manner with incidental work which will be provided by other trades, fabricate and erect full size typical Tower window opening and on prorated basis with other affected trades pay for weather tests which will be performed by Designer selected licensed testing laboratory.
- E. Perform tests and inspections per requirements of Section 1C, entitled "Tests and Inspections".

- F. At no additional expense to Owner, Designer or Structural Engineer, or their representatives, provide all travel and per diem expenses outside of San Francisco County as may be entailed for work of this Section.

3E-09

MATERIALS

- A. Cement: Low alkali portland cement conforming ASTM C150 and the following:
1. For exposed work use cement from same approved plant for any one type finish to assure permanent uniformity of color and appearance in completed project.
 2. For work concealed in completed project, grey is acceptable. Use products of single producer throughout.
- B. Aggregates:
1. General: Except for gradation and color in exposed locations conform to ASTM C33 for all fine and coarse aggregates. Do not change coarses for respective types without written approval.
 2. Exposed Aggregates: As selected and approved, to provide uniform finish color and appearance throughout project for each respective finish.
 3. For backup portions of work of this Section fully concealed within completed structure nonreactive hardrock aggregates from an approved source may be used.
- C. Water for mixing, curing and cleaning shall be clean, pure, and free of any acid, alkali, oil or organic material that may interfere with setting of concrete or may otherwise impair its strength, quality and appearance.
- D. Reinforcing:
1. Use galvanized reinforcing for members less than 4" in thickness.
 2. Deformed Bars: Intermediate grade conforming to ASTM A15 and A305.
 3. Cold Drawing Steel Wire: Conform to ASTM A82.
 4. Welded Wire Fabric: Conform to ASTM A185.

- E. Admixtures and Chemicals: Use none, except as specifically approved by Code Authorities and Designer.
- F. Coloring Pigments: Use only approved non-fading type in quantity to provide selected matrix color without reducing strength or wearing or weathering characteristics of mix.
- G. Attachment and Connection Devices:
1. Hot dip galvanize all members and touch up welds and abraded portions using either Galvalloy, Drigalv, Galvacon or approved equivalent.
 2. Structural Steel: Shapes and sizes designated conforming to ASTM A36.
 3. Welding Rods: Uniformly coated rods of types recommended by rod manufacturer for use with parent metal.
 4. Bolts and Nuts: As designated use high strength bolts and those conforming to ASTM A307 in respective locations. Use washers and shims shaped to structural members. In all instances also utilize approved lock washers or plate washers as shown on Structural Drawings.
- H. Ferrous Metal Primer: Red lead primer conforming to Fed. Spec. TT-P-86A Type I or Themec 99.
- J. Sealant and Joint Filler:
1. Filler for backup to sealant filled joints use proper size of closed cell polyurethane sponge equivalent to PRC. No. 89.
 2. Premolded Joint Backup: Approved type and size of synthetic rubber tubular deformed wing waterstops by size shape as designated for respective locations and equivalent to Electrovert, Inc. "Durajoint", locally distributed by Robert Cron & Associates, North Hollywood, California. Also use manufacturer's recommended splicing methods to assure continuity and manufacturer's recommended primer and adhesive to retain units in place during erection. Note: Use approved type asbestos rope as joint backup in 4 hour fire rated type walls.

3. Sealants (Caulking): Use non-staining one or two part, polysulfide sealant and sealant manufacturer's recommended primer in standard colors for respective locations as selected by Designer. Products shall be of a single producer throughout project and as manufactured by Minnesota Mining & Manufacturing Co., Products Research Corp., Mutual Research Laboratories and shall provide characteristics equal to or exceeding those of ASA Spec. A116.1-1960 and Fed. Spec. TT-S-227b for two component and Fed. Spec. TT-S-00230 for single component sealant. Submit samples and manufacturer's supporting technical literature and recommended procedures for Designer's selection and approval before use. Materials and workmanship shall be unconditionally guaranteed for period of not less than 10 years by material manufacturer and applicator.

3E-10

CONNECTION DEVICES

- A. Perform welding of reinforcing steel, metal inserts and connections, in accordance with "Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction" (AWS D12.1-61) of American Welding Society. Use care during welding of inserts and splices to minimize distortional affect of welding heat.
- B. Follow ACI 318 requirements where grout or concrete is used to embed connection devices between elements or to fill allowable casting tolerances. Also assure uniformity of appearance in finish work.

3E-11

CONCRETE QUALITY AND MIX DESIGN

- A. Use mix designs as approved by Designer and Code Authorities and as prepared by manufacturer which have proven by use to be satisfactory for type of high quality casting to be made and which produce strengths at least equivalent to those set forth in drawings and specifications.
- B. Cement content and type, aggregate type, gradation and content shall be determined on basis of approved samples, strength requirements and shall have cement content kept to a minimum in order to prevent shrinkage cracks.
- C. Water absorption of completed members shall be no greater than 5% when tested in accordance with ASTM C97.

- D. All concrete shall have 28 day minimum compressive strength of 5000 psi or greater as necessary to provide required finishes and density of completed work. Maximum plastic weight 125 pcf.

3E-12 MOLDS

Cast work of this Section in Molds of rigid construction to assure maintenance of dimensions within tolerance of 0, minus 1/8" in any length of 10 feet. Molds must be accurate in detail and dimension, built true, square, and rigid and designed to withstand all stresses resulting from casting, handling and curing processes. Also they shall be of such construction and finish to assure uniform smoothness of finish exposed surfaces.

3E-13 DESIGN AND FABRICATION

- A. Provide licensed engineer designed supplemental shop drawings and calculations covering additional reinforcing and inserts necessary for handling, lifting, stripping and erection of work of this Section. Prior to fabrication Submit and obtain approval of these, first from governing Code Authorities and then from the Designer and Structural Engineer.
- B. Accurately place and adequately secure reinforcement mesh, embedded items provided by other trades, inserts, and embedded attachments and handling devices to prevent displacement during fabrication and so as not to weaken or overstress the elements at any time.
- C. All reinforcing steel including temperature steel and all ties shall have a minimum coverage of 3/4" of concrete for a smooth surface and 1" for an exposed aggregate surface. Maintain a minimum clear distance between parallel bars of not less than 1-1/2 times the nominal maximum size of aggregates.
- D. Accurately locate all required setting and anchorage devices as shown on drawings and approved shop drawings and as required for attachment to supporting structure. Provide for adequate adjustment to line, level and position.
- E. Finish, sandblast and clean respective exposed surfaces before erection in such manner as required to produce uniformity for each throughout project and to provide match

with approved samples. Any acid washing or cleaning shall assure maintenance of nonyellowing and color fastness. Surfaces shall match approved samples.

- F. Thoroughly water or steam cure all units before delivery to job site.

3E-14

HANDLING AND ERECTION

- A. Prior to erection, inspect job site conditions. Report to General Contractor any discrepancies, variations or other conditions that may prevent satisfactory and proper erection operations. During erection, stop erection within affected areas should errors in work of other trades be discovered which affect work of this Section. For each instance assure correction prior to commencing erection within affected locations.
- B. Provide all transportation, hoisting and handling equipment as necessary for performance of work of this section.
- C. Erect all work by competent tradesmen under continuous supervision of manufacturer, and accurately set in positions assigned to them on approved installation and erection drawings. Securely anchor in final positions. All joints shall be treated in conformity with detail drawings using specified materials in designed locations to provide secure, weather and watertight completed installation.
- D. Protection:
 - 1. Protect work of this Section and that of other Trades from damage and, if damaged in performance of work of this Section, replace or repair same in manner acceptable to Designer, at no additional cost to Owner.
- E. Perform all caulking and weather sealing on clean, dry surface in accordance with requirements of and under job site supervision of material manufacturer. Provide guarantee as specified under "Materials" paragraph.

- END -

SECTION 3F

GUNITE CONCRETE

Requirements of Division 1 apply to work of this Section.

3F-01 SCOPE

Provide all Gunite concrete work complete as indicated and specified.

3F-02 WORK INCLUDED IN THIS SECTION

A. 3" nominal thick continuous fireproofing at basement slurry walls.

3F-03 MATERIALS

- A. Gunite as specified is trade name used to designate mixture of Portland cement and sand thoroughly mixed dry, passed through a cement gun and conveyed by air pressure through a flexible hose, hydrated at a nozzle at end of hose and then deposited by air pressure in required locations.
- B. Proportions: Unless otherwise specified, all Gunite shall be mixed in proportions of 1 part of cement to 4-1/2 parts of sand based on dry loose volume.
- C. Cement: Only Portland cements of American manufacture complying with current issue of ASIM C-150 shall be used. Type I or II Portland cement shall be used unless otherwise specified.
- D. Sand: Fine aggregate shall consist of washed sand and shall be hard, dense, durable, clean, sharp and graded evenly from fine to coarse per ASIM Designation: C 33-44. It shall be free from organic matter and shall not contain more than 5% by weight of deleterious substances.

LIMITS OF GRADING OF FINE AGGREGATES

SIEVE SIZE	PER CENT BY WEIGHT
Passing a 3/8 inch	100
Passing a No. 4	95-100

LIMITS OF GRADING OF FINE AGGREGATES (Continued)

SIEVE SIZE	PER CENT BY WEIGHT
Passing a No. 8	65-90
Passing a No. 16	45-75
Passing a No. 30	30-50
Passing a No. 50	10-22
Passing a No. 100	2-8

1. For proper placement of Gunite, sand shall contain between 3% and 6% moisture by weight. Sand and cement proportion may be corrected to provide for bulking due to sand moisture content. Percentage of bulking can be easily determined in field, using process based on theory that 100% surface saturation by water will develop a material density equal to that of loose dry sand. To run this test simply fill any vertical sided watertight container with water.
 2. Physically measure settlement of sand and calculate percent of shrinkage to vertical depth of container.
 3. Lightweight aggregates and refractory aggregates may be used per recommendations of manufacturer.
- E. Water used for hydration at nozzle shall be fit for drinking and shall be maintained at uniform pressure which shall be at least 15 pounds per square inch above air pressure at nozzle.
- F. All reinforcement shall be clean and free from loose mill scale, loose rust, oil or other coatings interfering with bond.
1. Reinforcement shall consist of 4 x 4, 8/8 electrically welded wire mesh. Mesh shall be furred out from member to be encased so that mesh occupies a position in center of encasement. Mesh laps shall be minimum of 4" and shall be securely tied with wire at intervals of 12". In general, mesh shall follow outline of member.

3F-04

TESTS

Provide all tests and inspections per requirements of Section 1C, "Tests and Inspections".

3F-05

SURFACE PREPARATION

- A. Masonry surface shall be thoroughly cleaned by washing with an air and water blast. Where surface is such that bond will be prevented, it shall be sandblasted or roughened to expose satisfactory surface. All loose material shall be removed.
- B. All steel surfaces to be encased with Gunitite shall be thoroughly clean and free of rust, paint scale, oil grease, dirt or other materials which would prevent bond.

3F-06

APPLICATION

- A. Operating Requirements: For lengths of hose up to 100 ft., air pressure at gun shall be 45 pounds per square inch or more. Where length exceeds 100' pressure shall be increased 5 pounds per square inch for each additional 50' of hose required. Constant pressure shall be maintained. Nozzles used for structural Guniting shall have a maximum size of 1-5/8".
- B. Rebound, recovered clean and free of foreign matter, may be reused as sand in a quantity not to exceed 20% of total sand requirements.
- C. Construction Joints: Particular care shall be given to formation of construction joints. They shall be sloped to a thin edge and entire joint shall be thoroughly wetted before adjacent Gunitite is placed. No square joints will be allowed, unless specifically required.
- D. Ground Wires: Adequate ground wires, to be used as screeds, shall be installed to establish thickness and surface planes of Gunitite work. Ground wires shall be placed so that they are tight and true to line and in such a manner that they may be easily tightened.
- E. Placing Gunitite: Whenever possible, except when enclosing reinforcing steel, nozzle shall be held at right angles to the Gunitite surface at a distance of 2"-6" to 3"-6". When enclosing steel, nozzle shall be held so as to direct material around bars. Each bar shall be shot from at least two directions. A nozzleman's helper equipped with an air jet shall attend nozzleman and blow out all rebound and sand which may have lodged on forms, steel or

Gunite. Gunite material shall emerge from nozzle in a steady, uninterrupted flow. When flow becomes intermittent for any cause, nozzle shall be diverted from work until flow again becomes constant. Hydration shall be thorough and uniform without use of excessive water.

1. In shooting walls, columns and beams, application shall begin at bottom and shall completely embed reinforcement. Limit of thickness and height has been exceeded when material begins to sag.

3F-07 FINISHING

- A. Upon reaching thickness and planes outlined by forms and ground wires, surface shall be rodded to true lines. Upon completion of rodding, ground wires may be removed. If possible, finish coat shall be applied so that Gunite is not shot over finished work. All exposed surfaces shall be finished to straight and true lines, as indicated on drawings. Finish shall be by steel trowel.

3F-08 CURING

Gunite shall be damp cured for at least 7 days after placing or by proper application of an approved sealing compound. It shall be mandatory for Gunite Contractor to perform curing operation. No Gunite shall be placed during freezing weather except when protective measures are taken as with ordinary concrete work. Gunite shall not be placed against frosted surfaces.

3F-09 WORKMEN

Only foremen, nozzle men, gunmen and rodman with at least three years of structural experience shall be employed and satisfactory written evidence of such experience shall be furnished Engineer or his representative upon demand.

3F-10 ELIGIBLE GUNITE CONTRACTORS

Contractor, to be eligible as a bidder, shall have had at least 5 years experience in Gunite construction and shall list at least 20 significant structural Gunite installations which he has constructed and which, on investigation, have been found to be completed in satisfactory manner. Bidders with limited experience are advised that very close scrutiny will be given all phases of this work. Unsatisfactory work will be imme-

diately rejected. Contractor is cautioned against attempting to substitute for specific equipment, items which have not been previously approved and items which may not meet all requirements of design and quality. Inferior equipment will not be accepted.

- END -

SECTION 4A

MASONRY

Requirements of Division 1 apply to work of this Section.

4A-01 SCOPE

Provide all Masonry work as indicated and specified, complete.

4A-02 MATERIALS

- A. Hollow Concrete Masonry Units: All units shall be load-bearing type as indicated on the drawings and shall conform to requirements of latest revision of ASTM C-90, "Hollow Load-Bearing Concrete Masonry Units", Grade A. With exceptions indicated, units shall be 2-core type 8" nominal height, 16" nominal length and thickness as indicated. Units for jamb, corner, lintel and other special shapes shall be provided as required. All units shall be sound, free of cracks, straight and true. They shall be either steam cured or cured under atmospheric conditions for a minimum of 30 days. Color shall be standard with manufacturer. Masonry units shall provide fire restrictive rating required.
- B. Cement: Portland cement conforming to the current ASTM Specification C-150, Type I.
- C. Hydrated Lime: Conforming to ASTM C-207, Type S.
- D. Aggregates: Sand shall conform to ASTM C-144. Pea gravel shall be graded with not more than 5% passing the No. 8 sieve and 100% passing the 3/8" sieve.
- E. Water: Clean and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious substances.
- F. Reinforcing Steel: Conform to requirements on structural drawings and in "Concrete Poured-In-Place" Section.

4A-03 CERTIFICATE

A certificate shall be issued by the manufacturer to the Designer, showing compliance with ASTM and curing requirements of these specification for hollow concrete masonry units.

4A-04

SAMPLES

- A. Submit samples of each type concrete block per "Samples and Shop Drawings" Section.
- B. Sample Panels: The first masonry construction laid into place of each type material, pattern, and coursing shall be stopped when a section approximately 10 feet long by 50 inches high has been constructed. These sections will be inspected by Designer whose approval of same must be obtained by Contractor prior to proceeding with masonry work. Should these sections not be approved by Designer, they shall be torn out and rebuilt to approval. These approved sections shall serve as a standard with which all similar work shall favorably conform in Designer's opinion.

4A-05

MORTAR AND GROUT

- A. The Method of proportioning materials for mortar and grout shall be by volume and in such manner that the specified proportions can be controlled and accurately maintained. Mixing shall be by a mechanical batch mixer for at least three minutes for mortar and five minutes for grout.
- B. Mortar and grout shall be proportioned as indicated on structural drawings and required by code.

4A-06

REINFORCING

All masonry units shall be reinforced, both vertically and horizontally, as indicated.

- A. Reinforcing shall be free from scale, rust or other coatings that would destroy bond. It shall be straight except for bends around corners or where bends or hooks are detailed. Size and spacing shall be as indicated on the drawings. Dowels and splices shall be lapped as indicated.

4A-07

ANCHORS

Coordinate work with other trades as necessary to set all anchors, bolts, nailing blocks, etc. Grout around anchors with sufficient mortar to make secure.

4A-08 STORAGE AND HANDLING

Masonry units shall be carefully stacked prior to use and shall be properly protected from weather by cover or inside storage. All units shall be handled with reasonable care to prevent marring or damaging of faces, edges and corners of units. In no case, shall dumping of units from hand trucks or wheel barrows be permitted.

4A-09 WORKMANSHIP AND CONSTRUCTION

- A. General: All masonry units shall be handled so that edges and faces will not be chipped, spalled or cracked. All beds on which masonry is to be laid shall be cleaned and wetted properly. All work shall be built plumb, level, square and true. All drilling, cutting and fitting, as required and as necessary to accommodate other trades, shall be done neatly by power-driven carborundum saw. Bolts, anchors, ties, conduits and other items for installation of work under other sections of the specifications shall be as far as practicable be placed as the work progresses. All walls shall be carried to underside of slabs.
- B. Masonry units shall not be wet before being used. Where no bond pattern is shown, walls shall be laid up in straight uniform course with regular running bond.
- C. Masonry units shall be laid with full mortar beds. Vertical head joints shall be buttered well for a thickness equal to the face shell of the block and shall be shoved tightly so that the mortar bonds well to both blocks. Joints shall be solidly filled from face of block to depth of face shell.
- D. Mortar joints shall be straight, clean and uniform thickness of 3/8". Concealed joints shall be struck flush. Joints above grade shall be compressed and tooled to a concave finish.
- E. All hollow masonry units shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and cross webs forming such cells to be filled shall be full-bedded in mortar to prevent leakage of grout.

- F. All cells containing reinforcement shall be filled solidly with grout in lifts not exceeding eight feet. Other cells, as indicated, where required to be solid for anchors or such items, shall also be filled. When grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1-1/2" below the top of the uppermost unit.
- G. Use end of block for exposed ends of walls and solid blocks for tops of walls left exposed to view. Provide reinforcing steel in lintel block at openings and overheads of hollow metal frames.
- H. Where masonry walls are to be left bare or painted, extreme care shall be taken to prevent mortar splashes. All forms shall be made tight and concrete or grout spilled on the wall shall be washed off before it can set up. Walls shall be protected against stains and excess mortar shall be wiped off the surface as the work progresses. After the wall is constructed it shall not be saturated with water for curing.
- J. Story-Poles: After sample masonry panels are built and approved, make "story-poles" accordingly. Use story-poles a minimum of every other course. Keep story-poles available for Designer's use. Masonry not meeting these requirements shall be removed.
- K. Masons shall comply with following requirements when working on floor slabs:
1. Concrete floor slabs shall have aged 14 days.
 2. Stack block maximum of 4 blocks high.
 3. Fork lifts may be used provided the total weight (for lift and load) shall not exceed weights approved by Designer
 4. Mason responsible for any damage to floor slabs and other installations thereon; repair same as directed by Designer at no additional expense to Owner.

4A-09

CLEANING

At the completion of the work, all holes or defective mortar joints in exposed masonry shall be pointed and where necessary defective joints shall be cut out and repointed. All exposed masonry shall be thoroughly cleaned of mortar droppings, sand and splotches to the satisfaction of the Designer. Where application of stiff brushes and water does not suffice, the surface shall be thoroughly wetted with clear water and scrubbed with a solution of not more than one part hydrochloric (Muriatic) acid to nine parts water, followed immediately by a thorough rinsing with clear water. All adjoining work subject to damage will be carefully protected from damage.

- END -

SECTION 5A

STRUCTURAL STEEL

5A-01 GENERAL

The General Conditions and Division 1 - General Requirements apply to the work of this section except as may be modified herein. Read the referenced documents and Section 1 for requirements contained therein which may affect the work of this section.

5A-02 SCOPE

The work includes the furnishing of all labor, material, appliances, equipment, transportation, and services required for the fabrication and erection of structural steel shown on the drawings and as herein specified. The successful bidder will be furnished sufficient drawings for his mill order cutting lists when required. Final drawings, when issued, will show all members and all required connections and holes for other trades.

5A-03 WORK INCLUDED

The work to be performed under this section shall include, but is not limited to, the following:

- A. Floor and roof framing.
- B. Columns, base plates, and the furnishings of anchor bolts and templates.
- C. Bracing.
- D. Punching of holes in structural steel for passage of reinforcing steel and for all other trades as indicated on the steel drawings.
- E. Hoisting of metal decking. Contractor shall cooperate with Decking Contractor. Metal decking may be used as safety planking.
- F. Providing and installing Nelson studs unless otherwise noted on drawings.

5A-04 WORK NOT INCLUDED IN THIS SECTION

The following items of related work are specified and included in the other sections of these specifications;

- A. Steel Deck:
- B. Welding of Steel Deck.
- C. Miscellaneous items of metal and architectural metals as noted in the applicable sections of these specifications.
- D. Concrete Reinforcement.
- E. Fireproofing of Structural Steel.
- F. Light Grade Steel Framing (Studs). See Lathing.
- G. Steel Elevator Rails.
- H. Stair Framing and Miscellaneous Metals.
- I. Welding of deck supports as indicated on drawings.
- J. Setting of anchor bolts and grouting for the base plates.

5A-05 CODES AND REGULATIONS

All material, fabrication and erection of the structural steel shall strictly conform to the latest "Specification for the Design, Fabrication and Erections of Structural Steel for Buildings" as adopted by AISC, San Francisco City Building Code and the Safety Regulations prescribed by the State of California.

5A-06 STANDARD PRACTICE

All work including general provisions, definitions, calculation of weights, Drawings and Specifications, materials, delivery, erection inspection and testing shall conform to the "Code of Standard Practice for Steel Buildings and Bridges" by AISC, revised February 20, 1963 unless otherwise indicated on the drawings or specified herein.

5A-07 MATERIALS

- A. Structural Steel: Structural steel, and appurtenant materials shall be new materials, conforming to "Specifications for Steel Bridges and Building", and ASTM Designation A-36 unless noted otherwise on drawings.

Base plates only may be of new material conforming to ASTM Designation A-7.

- B. Deleted

- C. High tensile bolts and washers shall conform to "Specifications for Quenched and Tempered Bolts and Studs with Suitable Nuts and Washers", ASTM Designation A-325.

- D. Machine Bolts shall conform to the requirements of ASTM "Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners", A-307.

- E. Stud Anchors shall be as manufactured by Nelson Stud Welding Division, Gregory Industries, Loraine, Ohio, or an approved equal.

- F. Filler Metal for Welding: Welding electrodes for manual shielded metal-arc welding shall conform to ASTM Specification A-233-58T, E60 or E70 Series. Bare electrodes and granular flux used in the submerged-arc process shall conform to Section 1.17.3 of AISC Specifications for Structural Steel for Buildings, adopted November 30, 1961.

- G. Paint: One of the following, at the Contractor's option:
 - 1. Themec #99 Red Metal Primer manufactured by Themec Co., Inc., North Kansas City, Missouri.
 - 2. Rust-Oleum X-60 Red Bare Metal Primer or #960 Zinc-Chromate Primer, manufactured by Rust-Oleum Corp., Evanston, Illinois.
 - 3. Or Other, as approved by Designer

5A-08 TESTS AND INSPECTIONS

Tests and inspections shall be provided as specified in Section 1C.

5A-09 SHOP AND ERECTION DRAWINGS

- A. Field Measurements: Before starting work or proceeding with shop and erection drawings, verify measurements

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

SECTION 5A
STRUCTURAL STEEL

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The General Conditions and Division 1 - General Requirements apply to the work of this section except as may be modified herein. Read the referenced documents and Section 1 for requirements contained therein which may affect the work of this section.

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The work includes the furnishing of all labor, material, appliances, equipment, transportation, and services required for the fabrication and erection of structural steel shown on the drawings and as herein specified. The successful bidder will be furnished sufficient drawings for his mill order cutting lists when required. Final drawings, when issued, will show all members and all required connections and holes for other trades.

5A-03 WORK INCLUDED

The work to be performed under this section shall include, but is not limited to, the following:

- A. Floor and roof framing.
- B. Columns, base plates, and the furnishings of anchor bolts and templates.
- C. Bracing.
- D. Punching of holes in structural steel for passage of reinforcing steel and for all other trades as indicated on the steel drawings.
- E. Hoisting of metal decking. Contractor shall cooperate with Decking Contractor. Metal decking may be used as safety planking.
- F. Providing and installing Nelson studs unless otherwise noted on drawings.

5A-04 WORK NOT INCLUDED IN THIS SECTION

The following items of related work are specified and included in the other sections of these specifications;

- A. Steel Deck.
- B. Welding of Steel Deck.
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- A. Structural Steel: Structural steel, and appurtenant materials shall be new materials, conforming to "Specifications for Steel Bridges and Building", and ASTM Designation A-36 unless noted otherwise on drawings.

Base plates only may be of new material conforming to ASTM Designation A-7.

- B. Deleted

- C. High tensile bolts and washers shall conform to "Specifications for Quenched and Tempered Bolts and Studs with Suitable Nuts and Washers", ASTM Designation A-325.

- D. Machine Bolts shall conform to the requirements of ASTM "Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners", A-307.

- E. Stud Anchors shall be as manufactured by Nelson Stud Welding Division, Gregory Industries, Loraine, Ohio, or an approved equal.

- F. Filler Metal for Welding: Welding electrodes for manual shielded metal-arc welding shall conform to ASTM Specification A-233-58T, E60 or E70 Series. Bare electrodes and granular flux used in the submerged-arc process shall conform to Section 1.17.3 of AISC Specifications for Structural Steel for Buildings, adopted November 30, 1961.

- G. Paint: One of the following, at the Contractor's option:
 - 1. Themec #99 Red Metal Primer manufactured by Themec Co., Inc., North Kansas City, Missouri.
 - 2. Rust-Oleum X-60 Red Bare Metal Primer or #960 Zinc-Chromate Primer, manufactured by Rust-Oleum Corp., Evanston, Illinois.
 - 3. Or Other, as approved by Designer

5A-08

TESTS AND INSPECTIONS

Tests and inspections shall be provided as specified in Section 1C.

5A-09

SHOP AND ERECTION DRAWINGS

- A. Field Measurements: Before starting work or proceeding with shop and erection drawings, verify measurements

lines, grades, elevations, locations and details of existing field conditions and be responsible for correctness, conformity, accuracy, and execution of structural steel work to conform to actual conditions.

- B. Prepare and Submit for approval complete checked shop drawings and erection diagrams, make corrections that would cause incorrect fitting, or result in insufficient strength, give notice of such fact at once and in writing, so that the correction may be modified before the work involved is started. Should there be failure or neglect to give such notice, then the sole responsibility therefor shall be an obligation under this Section.
- C. As-Built Drawings: After the work of this Section has been erected, correct or revise the originals of the approved shop drawings and erection diagrams to correspond with the changes made in the field, following which two blueprint copies of each shall be furnished for the Owner's and Designer's record file.

5A-10

WORKMANSHIP

- A. Equal to the best of standard practices in modern structural shops, and shall conform to applicable provisions contained in the Code of Standard Practice of the American Institute of Steel Construction, except where these requirements differ or infer differences therefrom, in which event these requirements shall govern.
- B. Injury and Undue Stress: Structural steel, both in shop and field, shall be transported, handled and erected to preclude injury, and in no case shall it be subject to undue stress in any part or connection.
- C. Detail of Connections: Except where otherwise indicated, connections shall be bolted in accordance with the standards of practice of the American Institute of Steel Construction. Welded connections shall be used where indicated.

5A-11

FABRICATION AND ASSEMBLY

- A. Before Being Fabricated, or worked, material shall be thoroughly wire-brushed, cleaned of loose mill scale and rust, and straightened by methods that will not injure the steel.

After punching or working the component parts of a member, twists or bends shall be removed before the parts are assembled. Finished members shall be free from twists, bends, and open joints when erected.

- B. Field Joining: Members and sections shall be of sizes, weights, shapes, and arrangements indicated, closely fitted, and finished true to line and in precise position necessary to allow accurate erection and proper joining of parts in the field. Light drifting to draw parts together will be acceptable, but drifting to enlarge unfair holes will not be allowed. Rolled sections, except for minor details, shall not be heated without prior approval.
- C. Contact: Component parts of built-up members shall be well pinned and rigidly maintained in close contact using clamps or temporary bolting during welding. Compression joints depending upon contact bearing shall have bearing surfaces truly milled perpendicular to their axis.

5A-12

GAS CUTTING

- A. Use of a Cutting Torch is allowed where the metal being cut is not carrying stress during the operation, and provided stresses will not be transmitted through a flame-cut surface. Gas cuts shall be smooth and regular in contour. To determine the effective width of members so cut, 1/8 inch shall be deducted from the width of the gas cut edges. The radius or re-entrant gas cut fillets shall be as large as practicable, but in no case less than one inch.

5A-13

PUNCHING, DRILLING AND REAMING

Material may be punched 1/16-inch larger than the nominal diameter of the bolt, wherever the thickness of the metal is equal to or less than the diameter of the bolt plus 1/8-inch. Where the metal is thicker than the diameter of the bolt plus 1/8-inch, the holes shall be drilled or sub-punched and reamed. The diameter for sub-punched holes, and the drill for sub-drilled holes, shall be 1/16-inch smaller than the nominal diameter of the bolt to be accommodated. Finished holes shall be precisely located to insure passage of bolts through assembled materials without drifting. Enlargement of holes necessary to receive bolts shall be done by reaming. Poor matching of holes shall be sufficient cause for rejection.

5A-14

BOLTING

High Strength Steel Bolts shall be used where indicated. Fabrication and erection shall be in strict accordance with the latest edition of "Specifications for Assembly of Structural Joints Using High-Strength Steel Bolts", as approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.

5A-15

WELDING

Make structural welding conform to American Welding Society D1.0-63, "Standard Code for Arc and Gas Welding in Building Construction", unless otherwise indicated or specified. Do welding by direct electric arc process or other approved method. Use operators thoroughly trained and experienced in arc welding, and certified within preceding 12-month period as prescribed by the American Welding Society Standard Qualification Procedure B3.0-41. The welding sequence and technique shall be carefully controlled to minimize shrinkage stresses and distortion. Provisions shall be made in the detailing and lengths of members for dimensional changes so as to provide the specified finished dimensions.

- A. Storage and Care of Electrodes: As recommended in latest edition of AISC Specifications.
- B. Preparation: Clean surfaces to be welded of paint, grease, loose scale, and foreign matter. Clean welds each time the electrode is changed, and chip clean, burned or flame-cut edges before welds are deposited. The same electrode may be used with various thicknesses of plate, but increase proportionately the current used and number of passes made. Base metal shall be pre-heated as required to the temperatures called for in the AISC Specifications.
- C. Quality: After being deposited, chip welds to remove slag and brush with wire brushes to exhibit uniform section, smoothness of welded metal, feather edges without undercuts or overlays, and freedom from porosity and clinkers. Visually inspect at edges and ends of fillets and butt joint welds for indication of good fusion with penetration into base metal.

- D. Holding and Protection: In assembling and during welding, hold the component parts of a built-up member with sufficient clamps or other adequate means to keep parts straight and in close contact. Take precautions to minimize "lock-up" stress and distortion due to heat. In wind, do welding only after adequate wind protection is furnished and set up. Cut out with a chisel welds or parts of welds found defective and replace with proper workmanship.

5A-16

COOPERATION

Actively Cooperate with others engaged on the work in accordance with the related provisions of the General Conditions, and provide punchings and drillings indicated or necessary for the securing of the work of others to the structural steel framing.

5A-17

ERECTION

- A. Structural Steel shall be erected with professional riggers and shall be carefully planned and laid out so that a minimum of cutting will be necessary. The work shall be erected plumb, square and true to line and level, and in precise positions as indicated. Temporary bracing and guys shall be introduced wherever necessary to provide for loads and stresses to which the structure may be subjected, including those due to erection equipment and their operation, and shall be left in place as long as it may be necessary for safeguarding all parts of the work.
- B. Temporary Connections: As erection progresses, the work shall be securely bolted up as necessary to maintain the steel in proper position while field bolting and welding is being done, and as necessary to take care of dead loads, wind, and erection stresses. No field welding or high strength bolting shall be done until the work has been properly aligned, plumbed and leveled.
- C. Temporary Floors: All temporary flooring, shoring, planking and scaffolding necessary in connection with the erection of the structural steel, or the support of erection machinery shall be provided as a part of the erection work. The temporary floors or use of steel decking shall be as required by municipal or state laws and governing safety regulations.
- D. Sequence: The erection of structural steel work shall be carried out in proper sequence with the work of other trades, and shall be framed, bedded, and anchored to the

concrete, masonry, and related work in strict accordance with the detailed drawings and approved setting diagrams.

E. Tolerances: Erection tolerances shall be in accordance with the 1963 AISC Code of Standards Practice for Steel Buildings and Bridges except as follows:

1. Individual Members except spandrel beams shall be considered plumb or level where the error does not exceed 1:750.

Spandrel beams shall be considered level where the error does not exceed 1:1500 plus or minus measured at the tops of their column connections.

2. Vertical Dimension, measured from the top of the beams at their connections at any one column shall not vary by more than plus or minus 1/4" per story exclusive of column shortening due to dead load.
3. Plumb Displacement of the center line of columns from the established column line shall be no more than one half inch toward or away from the established centerline in the first ten stories. Above this level, these limits may be increased 1/16 inch for each additional story, but not to exceed a total displacement of one inch toward or away from the established centerline.
4. Floor level shall be considered level if all floor framing members on any one floor, measured from the top of their column connections, do not vary by more than plus or minus 1/2".
5. Horizontal Dimension shall not vary by more than plus or minus 1:2000 for the overall length or width of the structure.

5A-18

ANCHOR BOLTS

Provide at the site for others to install as elsewhere required, all anchor bolts to be embedded in the concrete for the securing of structural steel in proper position. Provide the necessary templates and diagrams for the setting of such anchor bolts in the concrete forms, be jointly responsible with others for the proper locating and installing and make good deficiencies and errors. Setting of anchor bolts in hardened concrete, ne-

cessitated through error or oversight, and in existing concrete work, shall be made under direction in suitable drilled holes solidly grouted in place.

5A-19 DRY PACKING OF BASES AND PLATES

Be responsible for maintaining bases and bearing plates in proper location and in proper level while they are being grouted and be jointly responsible for a perfect job. Refer to Section 3A - Reinforced Concrete.

5A-20 PAINTING

- A. Structural Steel shall be thoroughly cleaned of loose mill scale, grease, dirt and foreign matter by thoroughly scraping, wire brushing or sandblasting, and surfaces, except those to be embedded in concrete or Mono-kote shall be given one shop coat of paint.
- B. Application: Paint shall be applied by brush or spray, thoroughly worked into joints, angles and open spaces, and shall be set-up, dry and well-hardened when the materials are loaded for delivery to the site.
- C. Contact Surfaces shall be thoroughly cleaned immediately prior to assembly and remain unpainted. Machine finished surfaces shall be heavily coated with tallow or other like removable and viscous coating to prevent corrosion.
- D. Touch-Up: After erection, field welds, field bolts, and abraded portions shall be cleaned and given an additional spot coat of the same materials, and the entire work left in a neat, clean and acceptable condition.

5A-21 GALVANIZING

Where certain items are indicated on the drawings to be galvanized they shall be galvanized by the hot dip process as per ASTM Spec. A 123 (coating weight per square foot of actual surface shall average not less than 2.3 oz. and no individual area shall show less than 2.0 oz.).

5A-22

CLEAN-UP

Upon completion of the work of this section, remove surplus materials, rubbish, and debris resulting from the operations, including disused equipment and implements of service, and leave the entire structure and site, insofar as the work of this section is concerned, in a neat, clean, and acceptable condition.

- END -

SECTION 5B

MISCELLANEOUS METALS

Requirements of Division 1 apply to work of this Section.

5B-01 SCOPE

Provide all Miscellaneous Metals Work as indicated and specified, complete.

- A. It is the intent of this section that all items not included in other sections of these specification shall be provided under Section 5B. Following sections (and All sections of this specification should be carefully studied to ascertain what items of related work are specified to be furnished and/or installed thereunder.

5B-02 GENERAL REQUIREMENTS

- A. Job Measurements. Verify conditions at site that affect work of this Section and take field measurements. Report any discrepancies between drawings and field dimensions to Architect prior to commencing work.
- B. Shop Drawings. Submit shop drawings per "Shop Drawings & Samples" section, showing materials, construction and fabrication details, layout and erection diagrams and method of anchorage to adjacent construction. Material fabricated or delivered to site prior to approval of shop drawings will be subject to rejection.
- C. Standards. Except for modifications indicated on drawings or specified herein. A.I.S.C.'s "Code of Standard Practice for Steel Buildings and Bridges", and American Welding Society's "Code for Fusion Welding and Gas Cutting in Building Construction", both as amended to date, and to applicable provisions of all local building codes, shall govern: materials, fabrication, and erection of all work under this section.

5B-03 MATERIALS

- A. General. Materials shall conform to following requirements of this section and where not covered shall be of new stock of at least equal grade specified for similar materials, or as indicated, and shall be free from defects

and imperfections of recent manufacture and unused. Where two or more identical articles or pieces of equipment are required, they shall be of same manufacture.

- B. Materials shall conform to latest applicable ASIM Standards. Where such standards indicate or require a choice of selection, consult Designer
- C. Metals shall be free from defects impairing strength, durability, appearance, and shall be best commercial quality for purposes specified, made with structural properties to withstand, safely, strains and stresses to which they will be normally subjected. Protect metals from injury at shop, in transit to job, and until erected in place, inspected, and accepted.
- D. Structural Steel. Rolled shapes, angles, plates, anchors, clips, etc., per ASIM A-36.
- E. Steel Pipe: Per ASIM A-53.
- F. Miscellaneous Steel shall be mild steel, except as noted or specified.
- G. Threaded bolts and nuts shall conform to Federal Specifications FF-B-571a for "Bolts, Nuts, Studs, and Tap Rivets (and Material for Same)."
- H. Arc Welding Electrodes. ASIM Designation A-233.
- J. Rust-Inhibitive Metal Primer. Tnemec #99 Series Etching Primer, or approved equal. All metal work not galvanized shall be primed for paint unless otherwise specified.
- K. Galvanizing. Conform to ASIM A-123. Field welds or damaged galvanizing coating shall be cleaned and given 2 coats of "Zinc" galvanizing compound as manufactured by the Sealube Co., Wakefield, Mass., or approved equal.

5B-04

WELDING

- A. Unless otherwise indicated or specified joints shall be welded by qualified welders using shielded electric-arc method. Welding rods shall be coated, not fluxed, of type recommended by manufacturer for use with parent metal. Reference is made to current edition "Welding Handbook", published by American Welding Society, as a guide and for qualification of welders.

- B. All welds shall be made per best practice. Weld on unexposed sides to prevent pitting, discoloring, "weld-halo", and other surface imperfections after finishing. Surface to be welded shall be thoroughly cleaned and welds shall show uniform section and smoothness, without distortion due to heat. Exposed surfaces of welded joints shall be dressed and finished to produce invisible connections. Welding alloys shall be finished in same color and character of surface as metals joined.

5B-05

FABRICATION AND ERECTION - MISCELLANEOUS METALS

- A. Workmanship shall be per best standard practice and shall be done by mechanics skilled in type of work required. Insofar as possible, work shall be fitted and shop assembled, ready for erection. Jointing and intersections shall be accurately made, in true plane with adequate fastenings. Exposed joints shall be even and smooth and exposed welded joints ground smooth and flush.
- B. Provide holes of proper sizes and in correct locations required for attachment of work of other trades. Do all cutting, tapping, drilling required, including for attachment of work of other trades. Component parts shall be held together as prescribed by drawings (including approved shop drawings) and by specifications, or in absence of such prescription, Contractor may exercise his option, subject to Designer's prior approval. Finish all items free of kinks, twists, burrs and open joints. Damaged or distorted materials will not be allowed.
- C. Work to built into concrete and masonry shall be of form required for anchorage or be provided with suitable anchors.
- D. Form work to detail, with clean, straight, sharply defined profiles. Exposed joints shall be close fitting and made where least conspicuous.
- E. Install supporting members, fastenings, frames, hangers, bracing, brackets, straps, bolts, and angles required to set and connect work rigidly and properly to other construction.
- F. Drill holes for bolts and screws; countersink holes for exposed screws. Provide rebates, lugs and brackets so work can be assembled in neat, substantial manner.

- G. Conceal fastenings where possible. Exposed fastenings shall be of same metal as that in which they are used.
- H. Unless otherwise indicated, bolt and screw heads shall be flat head or countersunk oval (as best suited) in exposed faces of ornamental or finish character and elsewhere as required. Cut off bolts and screws, where exposed, flush with nuts or other adjacent metal. Erect all miscellaneous metal work plumb, square, true to lines, levels and/or elevations indicated.
- J. Miscellaneous Hardware. Metal work shall be furnished and installed complete with all necessary anchors, bolts, hardware and other accessories.

5B-06 BUILT-IN ANCHORAGE

Provide all bolts, anchors, inserts, and other miscellaneous steel or iron fastenings to be installed in forms before concrete pouring or built into concrete. Examine and check architectural, structural, mechanical and electrical drawings for number, type and location of such items.

5B-07 BACKING PLATES

With exceptions specified, and/or indicated, provide all steel backing plates required for securing work specified herein and indicated, to walls and partitions. These shall be formed of steel plate members of thickness, width, and length required to suit particular purposes and positions in structures and shall be securely welded to steel framing members of partitions. Framing members shall not be impaired by such attachment. NOTE: Backing plates for "Mechanical" and "Electrical" fixtures, etc., are specified in applicable specification sections.

5B-08 GALVANIZING AND PAINTING

- A. Galvanizing. Miscellaneous steel and iron on the exterior, at interior areas subject to moisture and elsewhere specifically so indicated or specified shall be hot dipped, zinc-coated after fabrication.
- B. Shop Coat. Miscellaneous ferrous metal work, except portions of items embedded in concrete, shall be cleaned of grease, rust, mill scale and other foreign matter, and shall be given a coat of specified paint after fabrication. All work, including galvanized items, shall be shop primed with specified etching primer per manufacturer's direction.

Apply paint by brush or spray and fill all joints and corners and cover all surfaces. Surfaces which will be inaccessible after assembly shall receive 2 shop coats of paint.

- C. Field Painting. Work delivered to site which has been carelessly or inadequately painted shall be cleaned and given an additional coat of paint before being installed. After installation, all field bolts, rivets, welds, and areas where paint has been rubbed off, shall be touched up with paint, after touch-up field welds on galvanized work with specified compound.

5B-09

ELEVATORS AND ESCALATORS

Study elevator and escalator specification sections and applicable drawings, including shop drawings to ascertain metal items to be provided under Section 5B.

5B-10

OTHER ITEMS

- A. With exceptions as specified, furnish, fabricate, and install all miscellaneous angles, channels, bent plate clips, anchors and other miscellaneous metal work, required. Such items shall be formed as detailed or, if not detailed, as required for location and purpose served, in accordance with applicable provisions specified herein. Furnish and install all items not specifically mentioned herein or in other sections which are customarily considered as part of this work, the same as though specified herein and detailed.
- B. Provide sleeves through concrete and masonry as required. Sleeves shall be of standard weight, wrought iron, mild steel or cast iron sections of size to allow approximately 1/4-inch all around between sleeve and item to be inserted. Pipe sleeves in connection with "Mechanical" and "Electrical" are specified to be provided under applicable sections.
- C. Provide anchors, brackets and plates of suitable steel where required in connection with steel, iron, wood, and concrete construction, of sizes, shapes and locations indicated: all complete.
- D. Metal ladders shall be of sizes, types and in locations indicated. Unless otherwise shown on drawings, fabricate as follows:

- (1) Vertical Ladders:
 - a. Side rails: 3/8" x 2-1/2" mild steel.
 - b. Rungs: 3/4" round steel with square ends beaded into rails; upset ends; space 12" o.c.
 - c. Anchor ladders at bottom, top and intermediate points not over 5' apart, with brackets (same size as rails and of length necessary to hold ladder 8" from wall), secured with expansion bolts.
 - (2) Ships Ladder: Fabricate of steel channel stringers with 1/4" thick checkered metal plate treads supported on steel angles. Provide galvanized steel pipe handrails welded to stringers. Furnish and install all clip angles, bolts and attachments required for anchorage. Finish shall be shop prime coat.
- E. Steel Channel and Angle Frames: Steel channel and angle frames at doors and hatches shall be neatly mitered at joints and fully welded. Anchor jamb with type of anchor indicated.
- (1) Provide continuous metal stops where doors are called for. Weld hardware to frame; provide cutouts and steel backing to receive hardware.
 - (2) Drill subframes to receive 5/16" bolts through strap anchors to metal door frames.
- F. Pipe Rails and Handrails:
- (1) Pipe Rails: Provide and install at locations indicated, in accordance with details and approved shop drawings. Rails: accurately curved, bent and shaped as detailed, to fit stair landings and rakes. Except where otherwise indicated, construct pipe rails of 1-1/4" I.D. standard weight steel pipe, with joints accurately cut, mitered, welded and ground to smooth flush surfaces.
 - (2) Set standards in pipe sleeves cast into concrete where indicated. At steel stairs and ships ladder weld standards to stair stringers. Standards set in pipe sleeves shall be plumb and true, with intervening space filled with Por-Rok in accordance with manufac-

urer's instructions. Where indicated, flatten bottom end posts and attach to concrete with bolts in two-unit cinch anchors, or other approved expansion shield.

- (3) Wall Flanges: Where railings terminate against walls, provide wall flanges as detailed, and secure to concrete or masonry surfaces with expansion bolts and to stud partitions with machine screws into threaded holes in steel plates welded to studs.
 - (4) Attach wall rails to wall with brackets spaced not over 6 feet apart, except where otherwise indicated. Brackets shall be bolted to masonry or concrete walls and attached to metal lath and plaster partitions by bolting or tap screwing to steel backing plates as above specified.
 - (5) Finishes for Pipe Rails and Handrails: Exterior open areas and in Mechanical and Electrical rooms and spaces: hot dip galvanized: Interior: shop paint prime coat.
- G. Guard Screens and Gates at Elevator Pits: Pre-fabricated panels of 1-1/2" 10# gauge woven wire diamond mesh in metal frames installed and attached to walls and floors of elevator pits as indicated. Finish: hot dip galvanized.
- H. Provide all gratings required and which are not specified to be provided under other sections of these specifications, including: exhaust grilles (Traffic grates) in garage level floors, trench covers, grating over air shaft.
- J. Steel Stairs With Cement Filled Treads: With exceptions as indicated, fabricate pan-type stairs as follows: stair stringers of 12", 10.6# channels; treads and risers 14 gauge steel of interlocking type, tread and riser brackets 1-1/4 x 1-1/4 x 3/16 inch angles; sub-platforms of 14 gauge steel, reinforced by angles or tees and bolted to framing with 1/4 inch diameter bolts at 18" o.c. maximum.
- K. Provide angles and other steel members required for supporting and framing metal louvers in exterior walls and which are not furnished by louver manufacturer.
- L. Provide framing required for openings in floors and roofs, (including for trash chutes, mail chute, pneumatic tube system) which is not specified to be provided by other trades.

Miscellaneous Metal

Page 5B-7

- M. Steel angle and channel thresholds and curb and dock angles of types and sizes indicated.
- N. Steel framing and checkered plate platform above "trash packer" and elsewhere as indicated.
- O. Alhambra A-1980 column corner wheel bumpers.
- P. Metal framing and checkered plate walkway of catwalks.
- Q. Angles for expansion joints.
- R. Pull-irons in Transformer Room.
- S. Ceiling Suspension For Toilet Partitions: Provide steel channels to support ceiling hung toilet partitions. Location of channels and spacing of holes shall conform to requirements on "Toilet Partition" shop drawings. Secure channels in place in approved manner.
- T. Provide steel items identified on structural drawings as being "Miscellaneous Metal".
- U. Provide metal items for Transformer Vault, including:

Material	PG&E Code No.	Available Suppliers
Manhole Cover 39" Grated	36-1038	Broadhead Steel Products, Co. South San Francisco
Manhole Frame - 39"	36-1050	Broadhead Steel Products, Co. South San Francisco
Manhole Ladders (Specify Length)	36-2119 to 36-2126	Kortick Manufacturing Co.
Space Bolts, Galvanized 3/8" x 20"	19-2352	McGraw Edison Power Systems Kortick Manufacturing Co.
Drawbolt	36-2029	McGraw Edison Power Systems Kortick Manufacturing Co.
Ladder Bolt	19-1191	Hubbard Co. Div. of Kearney
Ground Rods 5/8" x 8' 0"	18-7013	Jasper Blackburn Corp. Hubbard Co. Div. of Kearney Joslyn Pacific Co. McGraw Edison Power Systems.

- V. Steel framing for sidewalk access cover.
- W. Steel framing for separation joints between buildings which is not provided with seismic joint covers specified in "Building Specialties" Section 10C.
- X. Pipe battens at platform.
- Y. Steel grille (bar stock) between Smoke Tower and stair vestibules.
- Z. Study shop drawings of other trades and supplies and ascertain and provide all miscellaneous items of metal required for secure and approved installation of items indicated on such shop drawings and not provided by such "other trades and suppliers".

5B-11

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study drawings and these specifications in regards to Alteration Work required, as he will be held responsible for satisfactory performance of all Miscellaneous Iron and Steel Work required therefor.
- B. Attention is called to drawings and to Section 1E of these Specifications.

- END -

Division

SECTION 5C

METAL DECKING

Requirements of Division 1 apply to work of this Section.

5C-01 SCOPE

Provide metal deck work as indicated and specified, complete. Principal items of work include but not limited to:

- A. Metal deck and accessories including all required flashings and cell closures.
- B. Metal deck angle supports at columns and angle reinforcement at openings, or as detailed.
- C. Fabrication of metal deck units to accommodate all openings shown on structural drawings. Openings or holes required by other trades and not indicated on structural drawings shall be cut and reinforced, subject to Designer's prior approval, by metal deck trade but shall be paid for by trade requiring such holes.

5C-02 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete Fill: See Concrete and Cement Finish.
- B. Concrete Reinforcing.
- C. Fireproofing: See Plastering.
- D. Hoisting of Metal Deck: See Structural Steel.
- E. Angle Supports at Concrete Fireproofed Beams: See Structural Steel.

5C-03 SHOP AND ERECTION DRAWINGS

Prepare and submit to Designer for approval, shop and erection drawings of metal decking, including details of all flashing, closures, cover plates, angle supports, welds and mechanical fastenings and reinforcement and similar items which are to be applied or installed by Contractor.

5C-04 MATERIALS

- A. Metal decking and accessories shall be formed from steel sheet conforming to ASTM A 245-64 or A446-65T and shall

have minimum yield strength of at least 33,000 p.s.i., and of gauges called for herein. Sheet shall have received, before being formed, zinc-protective coating meeting requirements of ASTM A 525-67 for wipe coat classification with not less than .20 ounces zinc per square foot. Zinc coating shall show no cracking or flaking at points of bending. Sheets shall be continuously rolled providing sheets uniformly shaped in every respect.

- B. Use welding rods and modification of welding procedures as recommended by decking manufacturer, subject to Structural Engineer's approval. Submit manufacturer's written recommendations to Designer prior to starting installation.
- C. Provide system of hanger connector devices for attachment of hangers by other trades. Provide at least two rows of such devices along length of each 24" wide unit. Space hanger connectors in each row at not over 12" centers with one row staggered from other one-half space. Hanger devices may be an integral part of floor deck, a clip in the side joint, a flat headed pin with a hole in the tip, pre-punched holes, or other approved devices. Submit for approval details of type of hanger connector to be used, along with test data by a certified testing agency on the load carrying capacity of proposed connector. Load on any hanger connector will not exceed one-fourth of the connector's ultimate load nor will it exceed 100 pounds. Total load from all hangers on deck unit will not exceed 300 pounds in any one span.
- D. Deck units shall be formed with shear lugs to provide a mechanical key to transfer horizontal shear and to prevent vertical separation. Provide test results by an independent testing laboratory showing that the composite floor construction to be provided is equivalent to the type specified on the drawings. Tests shall be performed on greased, simple span deck units to prevent chemical or adhesive-bonding between concrete and steel.
- E. All flashings, closures, plates, starting channels and related roof deck accessory items required for completion of the work shall be 16 ga. min. unless noted otherwise, and shall be made of galvanized sheet steel as specified for decking material (or of material meeting ASTM Spec. A 525-67 commercial grade, 1.25 oz. ordered coating).

- F. Miscellaneous metal angle supports and reinforcement shall conform to ASIM A 7-65 or A 36-69. All miscellaneous metal items shall receive one shop coat of Themec #99 primer.

5C-05

TESTS AND INSPECTIONS

Refer to Section 1C "Tests and Inspections" for tests and inspections required.

5C-06

DESIGN

- A. Metal deck units shall have depth of 1-1/2" with fluted ribs 6 inches on center with at least a 2-inch wide bearing surface at each rib to insure sufficient bearing and welding area on structural steel, and shall be formed from not lighter than 18 gauge sheets. Units shall be 2 feet wide and of sufficient length to extend over 3 or more spans, except where otherwise indicated. Units shall have interlocking edges to permit proper fastening to insure transference of both lateral and vertical loads. Units shall be so formed that there is a gap between top surfaces of adjacent ribs of at least 2 inches to provide sufficient space for working of concrete into open portion of deck.
- B. Metal deck units shall be formed to have section modulus of least 0.40 in.³ and a moment of inertia of not less than 0.34 in.³ per foot of width. AISI publication "Light Gage Cold-Formed Steel Design Manual" (Latest Edition) shall govern design of steel deck units. Deck units shall have simple span non-composite working load capacity without shoring of 60 pounds per sq. ft. and shall not cause a deflection greater than L/240, and simple span composite working load capacity of 120 pounds per sq. ft. and shall not cause a deflection greater than L/360. Horizontal shear capacity to develop composite section shall be based on mechanical bond only. No adhesive bond shall be considered for computing composite section, ratio of modulus of elasticity of steel to that of concrete shall be 15 for calculations of deflection, and 10 for stress calculations.
- C. Notwithstanding types and minimum gauges herein specified, all floor units shall be fully guaranteed and warranted to meet following listed strength and service requirements:

1. Floor units are to be provided for use as safety planking with structural steel. Coordinate deck placement with steel erection. Steel erector shall be provided with necessary information as to load carrying ability of deck so that overloading and damage to decking does not occur. Deck shall be capable of withstanding normal light construction loads and traffic without being structurally or electrically damaged. Above specified minimum gauges should be increased if necessary to prevent field damage due to above described loading. Heavy loads and concentrated wheel loads from concrete carts, welding equipment, etc., will be distributed by planking or other means as required.
2. Contractor shall replace with new or repair, as required and at his expense, all floor units that suffer damage as result of failing to meet strength and service requirements specified. Major damage to decking, other than that caused by failure of decking to meet strength and service requirements specified, shall be corrected under this section and cost of correction shall be borne by trade causing damage.

5C-07

ERECTION

- A. All metal decking shall be hoisted and landed as part of work of Structural Steel Section. Provide personnel to distribute and place decking on steel frame to extent necessary for use as safety deck and construction floor in accordance with applicable safety rules and regulations.
- B. Decking units shall be placed on supporting steel framework and adjusted to final position before being permanently fastened. Each unit shall be brought to 2-1/2 inches minimum bearing on supporting beams. If supporting beams are not in proper alignment or at proper level with AISC steel tolerances, matter shall be brought to attention of Contractor who shall see that work is corrected before final placing of decking units. Units shall be placed in straight alignment for entire length of run of decking.
- C. Decking units shall be fastened to steel framework by 3/4 inch effective diameter penetration plug welds, spaced 6 inches on center at ends of units and at intermediate

supports, or as otherwise noted on drawings. Where two units abutt, each unit shall be so fastened to steel framing. All closures and flashings shall be tack-welded in place not more than 3'-0" on center and shall be such as to prevent leakage of concrete through deck. See Structural drawings for Nelson studs to be installed under this section.

- D. An overlap of male and female side joint lips of at least 5/8 inch shall be provided, side joints shall be fastened with an approved crimping tool of not more than 24 inch centers continuously and starting at end of unit. Should overlap be less than 5/8", side lap shall be fastened by welds 3/4" long at 24" o.c. continuously and starting at end of unit.
- E. Steel reinforcement, as indicated shall be provided on all holes greater than 6". Cutting and reinforcing of holes other than those detailed on drawings shall be done only as specifically approved by Designer.
- F. Leave slag in place at welds to be covered with concrete. Elsewhere, remove slag to bright metal and touch-up all welds and field cut edges with "Galvalloy", Zinc Shield Paint or Molten Zinc. Touch-up all abrasions and damaged areas in painted coatings on miscellaneous metal items.
- G. Welding shall be done only by welders certified for welding in light gauge metal, using materials and methods in accordance with manufacturer of metal decking.

5C-08

CLEAN-UP AND DISPOSAL

- A. After erection, remove metal cuttings and construction debris from deck. Remove grease, oil and other foreign material. Leave deck in proper condition for obtaining bond with concrete fill or fireproofing.
- B. During and upon completion of work of this section, remove implements and equipment when no longer required. As pertains to the work of this section, leave building and site in a clean and approved condition.

- END -

SECTION 5D

ARCHITECTURAL METAL WORK

Requirements of Division 1 apply to work of this Section.

5D-01

SCOPE

Provide all architectural metal work as specified and indicated; complete, in place, with all anchors, attachments, bolts, fasteners, accessories and appurtenances. Principal items of work include:

- A. Bronze anodized aluminum bars (grille) between air intake and Carriage Drive entrance.
- B. Wrought iron gate in Coffee Shop.
- C. Woven bronze mesh corner guards at precast columns (See Drwg. 9-8, details 10 and 15) to match sample in Contractor's job-site office.
- D. Bronze anodized aluminum plate for wood rail in Sky Bar.
- E. Decorative Hood in Coffee Shop; Display cases as detailed.
- F. Anodized aluminum awnings.
- G. "Finish Schedule":
- H. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. Copies of these volumes can be seen at Contractor's jobsite office.~~
 1. Provide following architectural metal items as listed in Volume 2:
 - a. Decorative hood as noted on page MET-1, complete with "Blenco glass", 12" x 12" x 1" as noted on page MISC-1.
 - b. Brushed bronze metal trim as noted on page MET-5.

Architectural Metal Work

Page 5D-1

- c. Special extrusion, black anodized aluminum trim as noted on page MET-6.
- d. Special anodized aluminum trim as noted on page MET-7.

5D-02

WORK NOT INCLUDED IN THIS SECTION

Following sections and all other sections, shall be carefully studied to ascertain items of related work specified to be furnished and installed or installed thereunder:

- A. "Structural Steel" and "Miscellaneous Metals".
- B. "Prefinished Metal Panels".
- C. "Aluminum Framed Doors": Aluminum portions of glazed "fence" at air shaft on 4th floor level specified to be provided therein.
- D. "Aluminum Window Walls": Various anodized aluminum items are specified to be provided therein, including: aluminum panels at Cashier's Room (Carriage Level) and bronze anodized window frames in Coffee Shop Lobby.
- E. "Roll-Up Doors and Grilles".
- F. The "special anodized" trim noted on MET-6 is specified to be furnished in Section 5D for installation by applicable trade: "Marble Work", "Wall Coverings", and "Carpentry and Millwork".
- G. Black anodized aluminum trim at marble on columns is specified to be provided under "Marble Work" section.
- H. "Wall Coverings" & Metal foil type wall and counter coverings as noted on Pages MET-3 and MET-4 are specified to be provided therein.
- J. Other items as specified.

5D-03

MANUFACTURERS

Work specified herein shall be fabricated by one of following, or approved equal: A. J. Bayer Company or Cochran - Izant and Company.

5D-04 SHOP DRAWINGS AND SAMPLES

Submit in accordance with applicable provisions of "General Conditions Requirements". Verify dimensions at building. Samples shall match approved samples in Architect's office.

5D-05 MATERIALS used shall be as indicated and as follows:

- A. Bronze shall be copper zinc alloy best commercial grade; color shall match required approved sample.
- B. Iron Work shall conform to minimal requirements established in "Structural Steel" and "Miscellaneous Metals" sections.
- C. Where fabricators are noted in Volume 2 or on drawings, materials used shall be said fabricators standards with exceptions indicated, including approved shop drawings.
- D. All aluminum, sheet and extrusions, shall be of alloy required to produce the required anodized color. Colors shall match approved samples.

5D-06 WORKMANSHIP

- A. Architectural metal shall be executed by an approved fabricator qualified to produce the highest grade metal work. All workmanship and finishes shall be first class in every particular. Only skilled workmen shall be employed in fabrication and erection of this work.
- B. All work shall be complete in every detail, and finished work acceptable to Designer. Finished work shall be strong and rigid, neat in appearance and free from defects.
- C. Castings shall be of fine even texture, unwarped and sound. All lines shall be sharp, profiles accurate, and ornament true to pattern, in accordance with drawings. Castings shall be of sufficient thickness to insure perfect work and strength required for their intended purpose.
- D. Faces of metal in contact shall have a hairline metal-to-metal joint. Insofar as possible, castings and other work shall be assembled with concealed fittings. Any exposed alignment at joints. Joints in cast work, and where adjoining other work, shall be so formed as to prevent entrance of water. Castings which are rabbeted shall

have lugs for connection to adjoining sections or other work, and shall be fitted with shoulders or brackets. All miters shall be cut and finished to perfect fit. Necessary ribs, brackets, fillets, and other reinforcements shall be cast integral with main body of work. Members built up of drawn or extruded metal shall be held together at end joints by concealed sleeves of similar shape, welded in place. Such joints shall allow sufficient room for expansion. Where 2 or more cast pieces are used in building up members, contact surfaces shall be brought to true, smooth and even surfaces, and be so secured that joints shall be tight and invisible without use of pointing or caulking. Where exposed rivets, screws, or bolts can be avoided, heads shall be countersunk and finished to match texture of adjoining work. Welded joints when dressed shall be free from porosity, cracks or blow-holes and shall be finished to match adjacent surfaces. When welding and dressing operations are complete, all welding flux shall be removed without undue delay.

5D-07 WROUGHT IRON

Wrought Iron shall be fabricated of wrought iron of design, shapes, sizes as indicated on the drawings, including approved shop drawings. Assemble with full welded connections. Grind welds smooth. Workmanship can conform to requirements specified herein.

5D-08 PAINI

All ferrous surfaces shall be given 1 shop coat of primer of approved rust inhibitive type paint and one shop coat of approved gray lead and oil paint.

5D-09 DISSIMILAR METALS

Protect all finish metal surfaces in contact with concrete, plaster and dissimilar metals with heavy coat of asphalt or zinc chromate paint. Protect all exposed metals during transportation, and erection, and during completion of adjacent work, by paper or boxed coverings. Remove upon direction. Finished metals upon completion shall be given shop or field applied, protective coating that will preserve finish upon exposure, from extreme hot, cold or wet weather, hard contact, and oxidization.

5D-10

FABRICATION AND ERECTION

- A. Fabricate finished drawn or extruded metal members with fastenings of same material, insulate from direct contact with other metals and provide for expansion and contraction.
- B. Shop fabricated work shall be assembled and erected at building, plumb, square and unwarped. Gates and movable parts shall be expertly hung and shall operate smoothly upon completion.
- C. All anchor bolts shall be secured to cinch anchors set in drilled holes. Holes shall be drilled by this trade.
- D. Upon completion of erection work, all finish surfaces shall be free of hammer and other tool marks, scratches, blemishes or stains. Exposed surfaces shall be coated with peelable protective coating which shall be removed immediately prior to final acceptance of building by Owner.

- END -

SECTION 5E

PREFINISHED METAL PANELS

Requirements of Division 1 apply to work of this Section.

5E-01 SCOPE

Provide prefinished metal panels as indicated and specified, including:

1. Prefinished metal parapet screen on tower roof and enclosures for cables of exterior elevators.
2. Battens behind skin panels.
3. Caulking and sealing of wall units.
4. Clips, tracks, furring, shimming, bolts and anchorage of required for complete installations of panels and parapet coping.

5E-02 WORK NOT INCLUDED IN THIS SECTION

- A. Setting of embedded anchorages.
- B. Sheet metal flashing.
- C. Miscellaneous and structural steel framing.

5E-03 MANUFACTURER

- A. Manufacturer shall have been in the business of supplying monumental quality exterior wall systems for a period of five years or more. Details are those of Warnel, Division of Construction Metalwork Corp., South El Monte, California, Phone (213) 283-7234 or 443-9578.
- B. Alternate suppliers shall submit qualifications to Architect and be approved by Architect prior to bidding.

5E-04 MATERIALS AND CONSTRUCTION

- A. Skin panels - 16 ga. galvanized steel sheet, treated for coating adhesion.
- B. Horizontal bracing, battens galvanized D.W.C. channels, 24" vertical spacing attached to face sheet with stud anchors.

- C. All units to be caulked and weatherproofed with Thiokol base sealant per "Caulking" section of these specifications.

5E-05 FINISH

Finish on metal shall consist of a three coat texturing process. First coat shall be primer applied over steel chemically treated for adhesion by bonderizing process or equal, and by Textured Coatings of America. Primer shall be colored to match finished Texcote. Prime coat shall be followed by two finish coats at rate of fifty square feet per gallon. Texture finish shall consist of polyester alkyd resin vehicle, with filler of titanium oxide and fiberglass, with long life pigment colors as selected by Designer. Finish to match approved precast panels for color and texture.

5E-06 APPLICATION OF FINISH

Application of finish shall be performed with heavy duty airless equipment. High pressure material pump shall have pressure ratio not less than thirty to one. Application with conventional spray equipment is not acceptable.

5E-07

- A. Guarantee on all panels shall be furnished in writing, covering replacement of any defective materials or workmanship at no cost to Owner for period of two years. This includes waterproofing.
- B. Guarantee on finish on all metalwork shall be furnished by manufacturer of finish materials in writing and shall cover a period of 15 years. This shall cover chipping, cracking, and peeling. Also, finish manufacturer shall furnish weathering report from testing laboratory showing in advance that material has been pre-tested for weathering equivalent to 15 years. Test shall be 5,000 hour test by an Atlas twin arc weather tester. Tests shall prove resistance to fungus, growth and resistance to freezing and thawing cycles.
- C. Guarantees shall conform to requirements of Project General Requirements Section.

- END -

SECTION 6A

CARPENTRY & MILLWORK

Requirements of Division 1 apply to work of this Section.

6A-01 SCOPE

Provide all Carpentry and Millwork as indicated and specified, complete.

6A-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. With exceptions listed herein, all carpentry work, rough and finish, including millwork, required by Drawings, these Specifications and "Finish Schedules" as listed herein.
- B. Blocking, backing and wood nailers required for securing other work.
- C. Rough hardware required for work of this section.
- D. Wood flooring, including parquet type.
- E. All plywood and solid wood panelling, frames, trim, carved moldings, and similar items.
- F. Plastic laminate work.
- G. All wood trim, including door frames, base, fascias, counters, shelving, cabinets (job and shop fabricated types) and all other items of finish carpentry and millwork, not provided under other sections of these specifications.
- H. Fitting and hanging all wood doors.
- J. Finish Schedules, as used herein, refer to notations and Finish Schedules or contract drawings and following:
 - 1. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and~~

~~titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volumes 1 and Volumes 2. Copies of Volumes 1 and 2 may be seen at Contractor's jobsite office.~~

2. Provide all wood millwork, panelling, flooring, and other wood work of types, quality, manufacture, colors, and sizes listed on pages WD-11 through WD-16 in Volume 1.
3. Location shall be as indicated on Contract drawings, specified herein, and noted in Volume 1 and Volume 2.

6A-03

WORK NOT INCLUDED IN THIS SECTION

Following sections and all other pertinent sections, should be carefully studied to ascertain what items of related work are specified to be furnished and/or installed thereunder.

- A. Architectural Metals: Special anodized aluminum trim for installation (in Section 6A) above wood bases specified to be furnished therein.
- B. "Finish Hardware": Installation of finish hardware, as furnished by Owner, is specified therein.
- C. "Wood Doors".
- D. "Aluminum Window Wall": Anodized aluminum plate (for wood rail at Sky Bar), extruded aluminum frame at air diffusers in Sky Bar (plywood panelling for this frame is to be provided under Section 6A).

6A-04

GENERAL REQUIREMENTS

- A. Job Measurements: Verify conditions at site that affect work of this Section, and take field measurements as required. Report any discrepancies between drawings and field dimensions to _____ prior to commencing work.
- B. Shop Drawings: Submit shop drawings for approval, showing materials, construction and fabrication details, layout and erection diagrams as required, and method of anchorage to adjacent construction.
- C. Samples: Submit duplicate samples of each type of finish plywood and plastic laminate. Submit 3" x 24" samples of

hardwood, 6" x 12" samples of hardwood plywood. Upon request, furnish additional wood samples for painter. Submit full size samples of moldings, cabinets, counters, and other millwork items as directed.

6A-05

COOPERATION WITH OTHER TRADES

- A. Cooperate with all other trades with which work of this section connects or adjoins. Cooperate with all other trades in order that all portions of work as a whole fit snugly and satisfactorily and installations will be complete in every respect.
- B. Coordinate work with other trades involved. Furnish details, dimensions, templates, and drawings as required to obtain first class, and workmanlike finished job and so that work may be completed expeditiously.
- C. Cooperate with all trades and provide all grounds, blocking wood backing and framing, and perform all necessary cutting and patching of carpentry work as required. Such work shall conform to requirements indicated on drawings and specified herein.
- D. Inspect all installations made by other trades and report in writing to Designer all defective or improper work which affects work specified herein.
- E. Work specified and required under this Section shall not be started until all such defective or improper work has been corrected, inspected and approved by Designer.

6A-06

WORKMANSHIP

- A. Work shall be performed in accordance with best standards of practice relating to trade and under constant supervision of a competent foreman, who shall carefully plan and lay out carpentry and millwork installations as required to carry out intent of drawings and specifications and to properly accommodate work of other trades.
- B. Lumber and framing shall be accurately saw-cut and fitted into respective locations, true to lines, grades and levels as indicated or required; and permanently secured in proper position with spikes, nailings, lag screws, boltings and other fastenings and fittings as detailed, specified herein, and as required to render construction work substantial and rigid in all parts and connections.

- C. No interior wood finish, standing or running trim, or doors shall be installed in any room or space within structure until such room or space is dry.
- D. All finish woodwork of every nature, shall be smoothly dressed, belt-sanded at mill, and handsanded at bench prior to erection, and shall finish free from open joints, hammer and machine marks, and other structural defects and surface blemishes.
- E. All wood finish shall be manufactured by skilled mechanics. Trim shall be true to detail, clean and sharply defined, and all arrises in finished work slightly rounded by sanding.

6A-07

DEFECTIVE WORKMANSHIP AND MATERIALS

All defective work and materials shall be replaced in manner which meets all requirements of this specification and approval of Designer without any additional cost to Owner.

6A-08

DELIVERY AND STORAGE

Lumber delivered to site shall be carefully piled off ground in such manner to insure proper drainage and ventilation. Provide protection from weather. Materials, lumber, finish, millwork, doors, etc., shall not be delivered to building in damp or wet weather, and shall not be stored or installed in buildings until concrete, cement finish, plaster, and other items which raise humidity in buildings, are thoroughly dry.

6A-09

MATERIALS

- A. Lumber and millwork shall be new, clean stock of species and grades indicated and/or specified for the various uses.
- B. Lumber Species, Grading, Size and Pattern: Lumber shall bear official grade-mark of respective inspection bureau of association. Lumber shall be surfaced, milled or worked to patterns indicated or specified. All exposed surfaces shall be dressed. Grading Bureau and Association:
 1. West Coast Lumber Inspection Bureau (WCLIB).
 2. Woodwork Institute of California (W.I.C.).
 3. National Hardwood Lumber Association (N.H.L.A.).

4. Products Standard PS-1-66 (Products Standard Division of National Bureau of Standards).
- C. Materials for rough carpentry work shall conform to following minimum requirements:
1. Lumber: Each piece shall be grade stamped as to stress grade by the West Coast Lumbermen's Association as indicated on the drawings; use "Construction Grade: Douglas Fir, unless otherwise indicated.
 2. Preservative Treatments:
 - a. Wood Preservative Treatment: Lumber against concrete, masonry, plaster, including plates, blocking shall be Douglas Fir, and shall be pressure-treated by one of following methods, in accordance with American Wood Preservers' Association, Specification P-5. Treated lumber shall be branded certifying compliance with requirements.
 - (1) Wolmanized by treatment with Wolman Salts (Tanalith) preservative, using vacuum-pressure full cell process with a net dry salt retention of .35 pound per cubic foot of treated lumber.
 - (2) Chromated Zinc Chloride Treatment: (C.Z.C.) by Baxco pressure treatment with net dry salt retention of not less than .75 pound per cubic foot of treated lumber.
 - b. Fire treated wood shall be pressure impregnated with Koppers Co.'s "Non-Com" fireprotective chemicals to provide fire hazard classification of 15 or less by Underwriters' Laboratories, Inc. testing and so labeled.
 3. Plywood: Plywood shall be Douglas Fir (all plies), of thicknesses indicated on drawings and shall conform to PS 1-66.
 4. Waterproof glue for woodwork shall be first quality, capable of withstanding extreme climatic conditions of dampness, heat, cold and dryness.

5. Rough Hardware: Provide all items of rough hardware to complete the work. Include all angles, plates, bolts, nuts, washers, anchors, lag screws, nails, screws, plates, inserts, straps, fastenings and similar items of suitable size, type and quantity as required in the erection and construction of rough carpentry work, and to securely fasten them to supports, including anchors embedded in concrete and masonry. Also provide screws, nails, bolts, nuts, toggle bolts, metal plugs, anchors and fastenings as required for erection and application of finish millwork, casework, etc. All fastenings through finish, where exposed, or semi-exposed shall be recessed, and covered with wood putty finished flush and of same wood to match adjacent finish. All fastenings for exterior work shall be galvanized.

D. Materials for finish carpentry and millwork shall meet following minimum requirements:

1. Materials: All materials used shall be subject to Architect's approval. In addition to specified grading of lumber and plywood, all such materials which will be exposed to view in finished work shall be carefully selected. Lumber and plywood, plastics and other materials specified herein, which have been scratched, gouged or otherwise marred in shipping, handling, storing or erecting into place, or which bears watermarks or other stains which would be noticeable in finished work, will not be acceptable.
2. When hardwood and birch are indicated, use yellow birch "Select Red" grade for staining.
3. All other wood finish, not otherwise noted in Volumes 1 or 2, specified or indicated, shall be kiln-dried, vertical grain Douglas Fir, B and Better.
4. Plywood for use inside the building shall be Douglas Fir (D.F.) INT Group I A-D grade where one side only will be exposed to view in the finished work; INT Group I A-A grade where both sides will be so exposed; veneering shall be as indicated, noted in Volumes 1 or 2, or specified. Where edges of plywood are exposed to view in finish work, edges shall be banded to match veneer of plywood.

- a. With exceptions noted in Volumes 1 or 2, indicated, or specified all hardwood and special veneered plywood shall be Weyerhaeuser's "Architectural Grade".
 - b. Fire-ratings: Plywood shall be treated and bear U.L. labels for ratings required by drawings, building code, and State Fire Marshal's office.
5. Laminated plastic shall be of types indicated, noted in Volumes 1 and 2 and as follows:
- a. Colors and patterns shall be as noted in Volumes 1 or 2 or, if not listed, as selected by Designer.
 - b. Use 1/16" General Purpose Grade for horizontal and vertical applications where radiused edges are not required.
 - c. Use .050" Performing Grade II where radiused edges are required.
 - d. Use 1/16" Balancing Sheet Grade 92 for application to unexposed (back) side of panels veneered with decorative type plastic laminate.
 - e. With exceptions noted in Volume 2, plastic laminate shall be Formica, Micarta, Lamin Art, or approved equal.
6. Lumber Seasoning: All lumber shall be dry and well seasoned.
- a. Rough Lumber: Moisture content shall not exceed 19% at time of use.
 - b. Finish Lumber: Moisture content shall not exceed 12% at time of use.
7. Miscellaneous materials as required, and not individually specified herein, shall be of best commercial grades available, subject to Designer's approval. Where grades of materials may not be specified, grades most suitable for purpose required shall be furnished, subject to Designer's approval.

8. Other materials shall be as specified hereinafter. Contractor is, however, cautioned that should contents of this section of notes and details on drawings fail to adequately describe materials required, he shall call such omission to Designer attention, as he will, in all cases, be required to provide materials meeting with Designer's approval.

6A-10

ROUGH CARPENTRY

- A. Workmanship: Work accurately fitted, securely joined and properly finished by skilled mechanics using highest standards of workmanship, work carefully laid out, true to line and grade as indicated and as necessary. Securely fasten with nails, screws, bolts or other fastenings as required for substantial, rigid connection. Bolt holes shall be drilled 1/32 to 1/16 inch larger than bolt size. Bolts shall be fitted with malleable iron washers under heads and nuts.
- B. Rough carpentry shall include wood furring, blocking, grounds, rough frames, nailing strips, backing and sheathing and all other rough woodwork of whatever nature necessary to complete work per Contract Documents.
- C. Where lumber is nailed together, common wire nails shall be used. Nails or spikes shall be of such a length that, where joining lumber, penetration of nail into second piece shall not be less than 1/2 length of nail. No "box" nails shall be allowed.
- D. Provide wood nailing strips, plates, and blocking of sizes required. Nailing strips in connection with metal work shall be bolted to metal. Wood nailing blocks in concrete shall be tank dipped in preservative and built into concrete. Strips applied to concrete walls shall be attached at 2'-0" on center with power driven metal cleats.
- E. Provide wood grounds where wood trim, cabinets, and other items requiring grounds, occur. Grounds shall be of Douglas Fir and shall be 5/8" thick, and doubled where trim lumber exceeds 5" in width, or where indicated. Apply after lath has been installed for plastered walls, and set true to line. On partition surfaces, nail to wood backing at each bearing, on concrete surfaces nail to wood blocks built into concrete unless otherwise indicated.

- F. Scaffolding, Guards, Runways, etc.: Furnish, set and maintain runways or ladders leading from lowest level of building to roof, and serving conveniently for general use of all workmen. Provide all runways and temporary scaffolding, unless otherwise specified in other sections, such as "Lathing and Plastering" and "Painting", guard rails, and other related items necessary for proper execution of work.
- G. Temporary Closures and Barricades: Construct all temporary partitions, dust barriers and barricades, required to isolate work areas, prevent spreading of dust, dirt and debris, and adequately protect work and workmen. When such items have served their purpose, remove them.

6A-11

FINISH CARPENTRY AND MILLWORK

- A. With exceptions specified herein or indicated, all finish carpentry and millwork shall be, in Designer's opinion, equivalent to "Premium Grade" millwork as established by Woodwork Institute of California.
- B. Priming and Backpriming:
1. All wood finish and millwork shall be primed and back-primed as called for under "Painting" Section. Prime coat shall be applied at mill or immediately following delivery of material to job site.
 2. Fully cooperate with painting trade to facilitate this work.
 3. Consult "Finish Schedule" to determine types of finish required. Where natural finish is scheduled, apply clear sealer compatible with required finish or as specified under "Painting".
 4. Where necessary to cut doors and other millwork items for fitting, reprime cut portions immediately after they are cut to final size.
- C. Protect millwork against dampness during and after delivery. Store in well ventilated building and where not exposed to extreme changes of temperature and humidity.
- D. Do not bring interior finish, including doors, into building until building and interior materials and finishes, which raise the humidity of building, are dry.

- E. All wood finish and millwork shall be made at mill by skilled mechanics, using standard methods of manufacture and workmanship required for specified W.I.C. "Manual of Millwork Grades". Means of fastening various parts together shall be concealed except where necessary to use nails and their use is so approved.
- F. All measurements for millwork shall be checked and verified at building prior to fabrication. Only first-class millwork which fits perfectly will be acceptable.
- G. Make ample provisions for shrinking and/or swelling of all wood.
- H. Where necessary to cut and fit on the job, make ample allowance for such cutting.
- J. Joints: In general, miter all joints, corners or intersections. Fit all joints tightly. Cut out imperfections in running members.
- K. Lengths: Use one-piece vertical members throughout; splice by beveling (no butt joints) only where length so requires; and match grain of adjoining members.
- L. Examine and test backing members or areas which are to receive applied finish material. Report or correct any defects and irregularities. Backing must be in perfect planes to receive finish material.
- M. Assemble millwork and cabinet work in shop (or K.D. for job assembly). Conform to requirements for "Premium" grade of W.I.C. Standards, except as modified by approved shop drawings.
- N. Millwork shall be accurately milled to detail with cleanout mouldings, profiles, and lines. Sand smooth. Mortise, tenon, spline, house, glue, join, block, nail, screw or bolt together in best approved manner to avoid swelling or shrinking and to insure work remaining in place without warping, splitting or opening of joints.
- O. Except for items indicated to be resawn, all millwork finish shall be fine-sanded by machine and/or hand-sanded at mill and all machine and tool marks, stains, sawing marks, sanding burns, raised grain, or other defects entirely removed. After erection, all millwork shall again be smoothed

at joinings and elsewhere as required to make perfect finish. Nails, brads, and other fastenings shall be concealed so far as possible, and where necessarily exposed, shall be well set in for puttying.

- P. Fabrication and Installation: Contractor is cautioned that all millwork must be installed in accordance with workmanship and appearance, requirements specified herein, indicated and/or with apparent intent thereof. Install all millwork carefully, plumb, straight and true, firmly secured to proper grounds, blocking, furring, framing and/or backing. All joints shall be neatly and securely made. All materials used are subject to Designer's approval. Where a choice is given Contractor as to materials and/or construction methods, notify Designer as to proposed materials and/or methods.
- Q. All work shall be fitted and scribed to walls, plaster gypsum board, or other finished work in careful manner, so as not to injure surface in any way. All frames and finish of every sort shall be installed plumb, level, straight and true, and firmly secured in place. All nails shall be blind-nailed wherever possible, but where not possible, THE NAILING SHALL BE SO LOCATED AND DRIVEN AS NOT TO BE VISIBLE IN THE FINISH. ALL NAIL HEADS MUST BE SET.

6A-12

FITTING AND HANGING DOORS

- A. Fitting: Accurately fit each door to its frame and hardware, with due allowance for painter's finish and possible swelling and shrinking.
- B. Clearance: At lock and hanging stiles and at top, do not exceed 1/8"; do not exceed 1/2" at bottom, except as shown and required to clear carpeting and other applied floor finishes.
- C. Edges: Round arrises to 1/16" radius and slightly bevel lock stiles.
- D. Screws for Hardware: Do not drive by hammer, place by screwdriver.
- E. On completion, all doors shall be freely but not loosely operating, without sticking or binding, without hinge-bound conditions, and with all hardware properly adjusted and functioning.

6A-13

PLYWOOD PANELING

With exceptions indicated and specified herein, install or apply plywood, glues, or bonding cements to back-up material per applicable manufacturer's current written recommendations for applicable types of applications. Apply veneered plywood to backing by "Electronic Glueing" ("Woodwelding") process. Glue used shall be liquid urea "Weldwood" glue or type recommended by plywood manufacturer. Mix and apply glue per manufacturer's recommendations and instructions. Use chalk line to mark face of panels to allow Woodwelder hand gun and roller electrodes accurate positioning during glue curing cycle. Chalk mark shall be in exact location of glue spread on backing panel.

6A-14

WOOD FLOORING

- A. Wood flooring shall be types indicated and noted in Volume 2.
- B. Where Thai-Teak Parquet is noted it shall be as made by Bangkok Industries (Philadelphia, Pa.). Wood and pattern to be as noted in Volume 2.
- C. Installation of all wood flooring shall be per drawings, including approved shop drawings, and manufacturers written instructions and recommendations for this project.

6A-15

GUARANTEE

- A. All work shall be guaranteed per requirements of "General" and "Supplementary" General Conditions.
- B. All finish and millwork that may become warped or otherwise defective within one year following final acceptance of building by Owner, shall be replaced with new materials including removal, repairs and installation of adjacent materials and surfaces that become damaged as result of the replacement and repair work.
- C. Any work that is repaired or replaced, including adjacent surfaces, that may become marred as result of the repair work, shall be painted and finished.
- D. Repairs and replacement work, including painting and finish, are subject to approval by ,

6A-16

MISCELLANEOUS ITEMS

- A. Frames and trim for doors, glazed openings, and elsewhere as indicated shall be, unless otherwise indicated or noted in Volume 2, Douglas Fir and shall be fabricated as indicated and required for specified W.I.C. "Premium" grade millwork.
- B. Shelving for closet and linen shelves shall be 3/4" high density overlaid plywood with extruded plastic edges. Other shelving and other millwork items shall be of specified and indicated materials fabricated per drawings (including approved shop drawings).

6A-17

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Carpentry and Millwork required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 7A

ROOF INSULATION, BUILT-UP ROOFING, AND WATERPROOFING

Requirements of Division 1 shall apply to this section.

7A-01

PREPARATION

- A. Perform work in dry weather. All surfaces shall be dry before application of insulation.
- B. All surfaces shall be smooth, free of projections, dry and swept clean, free of dust, debris, or other loose materials. Inclined surfaces shall have been graded to drain outlets.
- C. Roof sub-surfaces and other surfaces and construction adjoining or affecting work of this section shall be examined by Roofing Sub-contractor and General Contractor before any work is started. Notify Designer, in writing, of any defects which would be detrimental to work of this Section. Absence of such report shall constitute Roofing Subcontractor's acceptance of roof decks, installations thereon, including flashings, and he will be held responsible for watertight installations of roofing and flashings. Application of insulation and roofing materials to roof constitutes acceptance of roof surfaces as acceptable to fulfill guarantee requirements.
- D. A requirement of this section is supervision of installation of flashings, and other metal in connection with roofing, specified in "Sheet Metal" and other sections. Guarantee water-tightness of jointing between flashing, other metal work, penetrations through roofs, and installations thereon and roofing and waterproofing.
- E. All installations on and through roofs shall be placed prior to starting work.

7A-02

INSULATION

- A. Insulation shall be Johns-Manville's 1" thick "Fesco Board", or approved equal, total of 2" thick (2 layers) unless otherwise indicated.
- B. Roofing insulation shall be kept dry at all times. It shall not be applied over anything but a completely dry substrate nor applied when subsequent traffic from roofing

crews, other trades, and equipment may damage it. Broken or damaged sheets shall not be used except after squaring and then only used as fill-in pieces.

- C. No more insulation shall be laid at any one time than can be protected by pitch and felt in case of sudden weather changes. Edges of insulation shall be brought closely together and shall not be forced into place. Where insulation joins vertical surfaces, cut insulation in a neat manner allowing at least 1/2" clearance.
- D. Apply insulation in two layers. Joints in second layer shall not coincide with preceding layer. Second layer shall be parallel to preceding layer.
- E. Application: Apply a uniform solid mop coating of Kopper's "Old Style Pitch" to the deck and while pitch is still hot, embed insulation. Mop entire first layer of insulation with specified pitch and, while pitch is hot, embed second layer.
- F. Insulation Cover: Application of roofing shall progress with the laying of insulation. Cover insulation with roofing by close of each day. Mop roofing membrane solid to insulation using 30 lbs. of pitch per 100 square feet.

7A-03

MATERIALS AND WORKMANSHIP

- A. Workmanship: Roofing and insulation shall be supplied by Contractor approved by material manufacturer. Application and workmanship shall conform to latest printed specifications and instructions of the manufacturer, except as otherwise specified herein.
- B. Roofing materials shall be manufactured by Koppers Company, or Celotex Corp. (Barrett). All materials shall be products of one manufacturer delivered in original, unbroken wrapping material with original labels thereon. For reasons of brevity, Kopper's Company's products are specified. This shall not be construed to limit competition.
- C. Coal Tar Pitch shall comply with ASTM Designation D-450, Type A.
- D. Flashing Compound shall be slow oxidizing, adhesive asphalt mastic reinforced with asbestos fibers and shall be standard brand furnished by roofing materials manufacturer.

- E. Gravel: 5/8" x 1/4" conforming to requirements of ASTM Spec-D-1863-64.

7A-04 APPLICATION OF CANT STRIP

Provide 4" cane fiber cant strip in angle of intersections of roof deck and vertical walls or curbs. Embed strips in hot asphalt on insulation. Cant strip shall fit flush at ends and to wall surface. Corners shall be mitered.

7A-05 GENERAL APPLICATION

- A. Coal Tar Pitch Temperature: Apply pitch at an average temperature of 325 to 375 degrees F. Do not heat to temperature higher than 400 degrees F. Flood coat shall be poured from dippers to provide a coating of uniform thickness.
- B. Metal Priming: Metal flashings and outlet flanges shall be primed and let dry, before roofing materials are laid.
- C. Outlets: Properly seal felt around drains according to type of drain used. Fill base of ring type drains with plastic cement before felt is applied. Install ring over felt and tighten while asphalt is warm.
- D. Vent Pipe Flashing: Set metal flanges on top of complete roof membrane system in a bed of plastic cement. Double felt strip flange with alternate moppings of pitch. Felt strips shall overlap flanges and extend at least 6" beyond onto roofing membrane system.

7A-06 APPLICATION OF BUILT-UP ROOFING

- A. With exceptions indicated and specified herein, apply built-up roofing per Koppers Company's Specification No. 23wi.
- B. Mop uniform coating of Old Style Pitch over insulation.
- C. Apply over entire surfaces, 4 plies of Kopper's Approved Tarred Felt, lapping plies 27-1/2 inches. Mop solidly between each 27-1/2" lap with Old Style Pitch so that in no place shall felt touch felt.
- D. Double Gravel: After felts are laid, apply flood coat of 75# pitch and while hot embed gravel at rate of 400# per

100 sq. ft. Sweep all loose gravel and pour over surface uniform pouring of 85# pitch, into which, while hot, spread second layer of 350# gravel.

7A-07 BASE FLASHING (Kopper's Specification No. 107)

Base flashing shall include 4 layers of 15 lb. Asphalt Felt and 1 layer of mineral surfaced cap sheet applied in asphalt. Trim built-up roof sheets evenly at wall line. Apply flashing system over roofing starting on flat portion of roof extending over cant strip and up walls as detailed. Apply flashing felts and cap sheet separately in HMP asphalt in 9' to 12' lengths with 2" end laps, nailing top layer of felt 12" on centers to top of cant strip. Nail upper edge of cap sheet to walls at 12" o.c., use 1" diameter metal discs on nails. Apply ribbon of flashing compound 3" wide sealing upper edge of base flashing 1/4" thick.

7A-08 MEMBRANE WATERPROOFING

- A. Materials shall be as made by Koppers Company, Inc., meeting following requirements:
1. Coal Tar Pitch: D-450, Type A.
 2. Tarred Felt: ASTM D-227.
 3. Tar Saturated Cotton Fabric: Standard Grade.
 4. 90# Mineralized Roofing.
- B. Membrane waterproofing is required between structural concrete slabs and concrete toppings or tile setting beds in following locations:
1. Double slabs of sidewalks.
 2. Sky Bar kitchens and employee toilets.
 3. Coffee Shop Kitchen.
 4. All Public toilets on 1st and 2nd floors and employee toilets on Mezzanine level.
 5. Elsewhere as indicated.

- C. Membrane waterproofing between double slabs of sidewalks shall consist of four 15# tarred felts, 1 layer of 90# mineralized roofing and 5 moppings of Type A pitch.
- D. Membrane waterproofing elsewhere shall consist of four 15# tarred felts and 5 moppings of Type A pitch.
- E. On roof deck at 4th floor level (east of Patio's) apply 2" Fesco board in 2 separate layers as specified herein and apply two layers of 15# tarred felts and 2 plies of Tar Saturated Cotton Fabric applied with alternate moppings of Type A pitch and final mopped on layer of 90# Mineralized roofing.
- F. Application of Waterproofing Membranes - General:
1. Surfaces shall be smooth, clean and dry.
 2. On 4th floor roof level, solid mop pitch to concrete and insulation and between plies at the rate of not less than 25# per moppings per each 100 sq. ft.
 3. The 90# mineralized roofing shall be cut in approx. 12' lengths and piled flat for a sufficient time to remove all wrinkles and buckles. Mop over tarred felt membrane over all completed membranes at the end of each day's work lapping 2" at sides and 4" at ends.
 4. Membrane at ramps shall be backnailed with concrete nails through tin discs in such a manner that all nails are covered with not less than two plies of felt and pitch moppings.
 5. All membranes shall be firmly bonded.
 6. Between slabs at sidewalk areas the membrane shall be turned up on walls 1'.
 7. At exterior intersections of flat and vertical surfaces the bottom two plies of felt and pitch moppings shall be carefully turned up 90°. Re-inforce angle with three strips of Tar Saturated Cotton Fabric and pitch moppings running fabric over horizontal membrane approx. 8". Nail at edge with concrete nails through tin discs 8" o.c. and seal off top edge with plastic cement.

7A-09

SEAMLESS MEMBRANE WATERPROOFING

Between double concrete slabs of Truck ramp between Carriage and Service levels, of Patios, between structural concrete slab and concrete topping and tile setting beds of Carriage Level Floors, and elsewhere as indicated apply Toch Brothers "Thio-deck", 50 mils thick per manufacturer's current written instructions and recommendations for this type application.

- A. Remove all grease, dirt, water and other foreign materials which would adversely affect the adherence of the seamless membrane to the sub-stratum.
- B. All construction and expansion joints shall be filled with closed cell butyl rod to within 1/2" of surface. The balance of the joint shall be filled with Thio-Deck Membrane in normal course of application. Prime coat all structural cracks in base slab with 50 mils of Thio-Deck Membrane to at least 3" on each side of crack.
- C. Where vertical walls meet horizontal slabs, apply Thio-Deck Membrane on the slab and up the wall to within 1" of the finish floor line. Within two hours, imbed a triangular "cant" strip and apply a second coat of Thio-Deck Membrane of at least 40 mils over the "cant" strip area.
- D. Mix, apply and cure Thio-deck per manufacturer's recommendations for this project.

7A-10

GUARANTEE

Work under this Section, including flashing installations, shall be guaranteed against defects resulting from use of inferior materials, equipment or workmanship in accordance with General Conditions and Project General Requirements section for a period of five years. Guarantees shall be in writing to Owner and Architect.

7A-11

SUPERVISION, INSPECTION AND TEST CUTS

- A. All roofing and waterproofing work shall be performed under the supervision of Roofing Consultants, Inc. (1485 Bayshore Blvd., San Francisco); Owner will pay costs.
- B. Supervision, Inspection and Tests shall conform to requirements of Section 1C "Tests and Inspections".

7A-12

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all "Roof Insulation, Built-Up Roofing & Waterproofing" work required therefor.
- B. Attention is called to Section 1E of these specifications.

7A-13

ELASTOMERIC COATING

Where elastomeric coatings are indicated on the drawings (see Finish Schedule) apply Gaco Western Inc.'s "Gacodeck Neoprene-Hypalon Covering for Traffic Surfaces". Finish coat shall be of color as selected by Designer. Materials used and application, finishing, curing, and protection of same shall be per Gaco's written instructions and recommendations for this project. Minimum requirements shall be in accordance with Gaco's current Specification GW-15.

- END -

SECTION 7B

SHEET METAL

Requirements of Division 1 apply to work of this Section.

7B-01 SCOPE

Provide sheet metal work as indicated and specified, complete.

7B-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. All sheet metal flashing in connection with composition roofing, except flashing of plumbing vents and electrical conduits.
- B. Sheet metal gutters, downspouts, gravel guards, reglets, counterflashings, metal flashings, scuppers, and other miscellaneous sheet metal work indicated on drawings except as provided by other trades.
- C. Sheet metal enclosures at soil lines as indicated (see Drwg. 10.7, Detail 26).
- D. Priming sheet metal work to be concealed after installation.
- E. Caulking in accordance with Section 7C.
- F. All sheet steel No. 10 gauge and lighter required with exceptions as specified herein and/or indicated on the drawings.
- G. Contractor's attention is called to the fact that sheet metal items as indicated are indicative of locations requiring same and it is intent of drawings and these specifications that these items be provided for all similar locations.
- H. Submit shop drawings and samples per "Supplementary General Conditions" Section.

7B-3 WORK NOT INCLUDED IN THIS SECTION

Following sections and all other pertinent sections should be carefully studied to ascertain items of related work specified to be furnished and/or installed thereunder.

- A. Composition Roofing. Membrane flashings are specified therein.
- B. Plumbing. Galvanized steel pipe downspouts, roof drains, roof flashings for piping penetrating roofs and other items.
- C. Air Conditioning. With exceptions as specified herein, all sheet metal work air conditioning systems, including ductwork, grilles and similar items indicated on the Mechanical Drawings; roof flashings for ducts and other air conditioning items penetrating roofs are specified therein.

7B-04

GENERAL REQUIREMENTS

- A. Shop Drawings. Prior to fabrication, submit shop drawings showing materials, gauges, profiles, fabrication, layout, jointing and method of attachment to adjacent construction and obtain Designer's approval.
- B. Verification of Conditions. Verify at site all field measurements and conditions affecting work of this Section. Report to Designer any major discrepancies between drawings and field conditions prior to commencing work. Commencing work shall indicate acceptance of conditions and surfaces underlying and adjacent to work of this Section.
- C. Samples. Prior to fabrication, submit sample sections and members, showing jointing, design and attachments, and other members when specifically requested. Completed work shall match approved samples.

7B-05

COOPERATION

- A. Work in close cooperation with all other trades whose work is affected by installation of sheet metal work.
- B. See that work of other trades contains adequate nailers, blocking, etc., as required for proper installation and attachment of sheet metal work, and that all trades concerned are so advised, sufficiently in advance so that they may, without delay, make such provisions in their work.
- C. Roof flashing and similar work shall be in place and/or ready for placing before application of roofing materials. All sheet metal work installed on roof shall be applied under supervision and inspection and to satisfaction of roofing materials manufacturer and his licensed applicator.

- D. Sheet metal work shall not be commenced in any area where preparatory work done by other trades is incomplete, or poorly prepared. Sheet metal trade shall notify Contractor who shall promptly expedite and/or correct such work to permit this trade to proceed without delay to complete the work. Delays from this cause may not be used as a basis for extension of time.

7B-06

MATERIALS

- A. Zinc Alloy. "Zinalloy", or "Hydro-T-Metal", of gauges as designated, except 0.020" minimum thickness.
1. Zinc shall meet requirements of Federal Specification AA-Z-351a, Grade A, except that the maximum lead content may be increased to 0.12% and tin added to a maximum of 0.0005%. Zinc alloy shall be composed of the specified zinc and from 0.8 to 1.2% copper. Submit manufacturer's certificate prior to installation.
- B. Galvanized Steel. With exceptions indicated, all sheet metal shall be 24 gauge galvanized steel.
- C. Solder. ASTM B-32, alloy grade 40A for galvanized steel and zinc alloy.
- D. Flux. Approved brand of non-corrosive flux and new muriatic acid killed with zinc. Remove excess flux and neutralize surfaces after soldering.
- E. Sealing Compound. As specified under Section 7D, "Caulking".
- F. Nails, Bolts, Screws and Rivets. Of best type suited for purpose and of composition that will not support galvanic action.
- G. Primer. Approved brand of zinc-dust zinc-oxide primer.

7B-07

STANDARDS AND WORKMANSHIP

- A. Standards. Details of sheet metal work which are not explicitly shown or specified shall comply with standards of Sheet Metal & Air Conditioning Contractor's National Association, Inc.'s (referred to herein as SMACNA) "Architectural Sheet Metal Manual", subject to Designer's approval.
1. Where anchors, connections, or other details of miscellaneous sheet metal items are not definitely shown or specified, their material, size, form, attachment and location shall conform to best practice.

2. Details and specifications of items for which standard manufactured products are available are representative guides for requirements of these items.
- B. All sheet metal work shall be fabricated in the shop and delivered to the project in sections ready to install. Fabricated pieces for sections shall be formed on a machine brake to full length of brake where possible. All angles and surfaces shall be straight, unwarped, and not strained. Provide mechanical expansion joints as necessary. Exception: All wall type counterflashings in reglets such joints shall be lapped 12" over preceding piece.
- C. All joints in flat sheets shall be lock seam type folded flat and sweated full of solder to form a smooth, flat joint, unless indicated otherwise.
- D. Corner returns shall be prefabricated in the shop with reinforced corners, well soldered and buffed smooth.
- E. Before shipping to the job, all fabricated work shall be free of hammer marks, tool marks, scratches and damages, arrises, or surfaces.
- F. Properly protect all fabricated work upon delivery to project site. Damaged work shall be sent back to shop for repair or refabrication as directed. All straps, clips, and anchoring devices shall be secured to building prior to installation of sheet metal work. Anchoring devices shall be fabricated and installed to adequately anchor all sheet metal work securely in place and to facilitate easy removal for repair or replacement. Screws and/or bolts shall be placed out of the weather and away from capillary action. Job soldering shall be accomplished with well heated irons of sufficient size to retain the heat in open air.

7B-08

FABRICATION AND INSTALLATION

- A. All surfaces to which sheet metal work is to be applied shall be free from defects of every description and broomed cleaned. All projections (nails, fins, etc.) set flush or removed as directed and/or required for complete and workmanlike installations.
- B. Verify measurements in field. Work shall be fabricated to fit job conditions. Accurately form to detail with clean, straight, and sharply defined profiles. Fabricate and erect work in thorough and workmanlike manner.

- C. Form, fabricate, and install work so as to provide for expansion and contraction in completed work. Make joints watertight throughout.
- D. Thoroughly clean surfaces before soldering. Solder slowly with full flowing joints. Use ample solder. Flat lock seams shall be at least 1/2" wide, and shall be sweated full of solder. Lap seams, where soldered, shall be at least 1/2" wide and where not soldered, shall be as detailed, but in no case less than 3 inches. All flat and lap seams shall be made in direction of flow.
- E. Except as otherwise detailed, all exposed edges of sheet metal shall be doubled back 1/2" minimum.
- F. Secure work by means of cleats to avoid nailing through exposed face of metal. Except as otherwise shown or specified, space nails, rivets or screws not more than 8" o.c. Where fastenings are exposed to weather, use screws and lead washers.
- G. Join parts with rivets or sheet metal screws where necessary to provide strength or stiffness.
- H. Isolation of incompatible metals shall be provided in installations where recommended by the manufacturer. Zinc alloy shall be given a coat of asphalt paint and further protected with an isolation barrier of 30# asphalt impregnated felt to prevent contact with incompatible metals or materials.

7B-09 FLASHING FLANGES AT ROOF DRAINS

Provide zinc alloy flashing flange for all roof drains with flanges extending not less than 6" beyond flashing ring of drain.

7B-10 REGLETS, FLASHING AND COUNTERFLASHING

Provide at all intersections of roofs and vertical surfaces, at openings in roof (with exceptions as specified herein), and elsewhere as indicated or required to make work watertight throughout. Counterflashings shall lap base flashings at least 4" with bottom edges folded under 1/2" minimum. See Drawings for typical reglets and flashings.

7B-11 GRAVEL GUARDS

Set flange of gravel stops in plastic cement, furnished by roofing trade, on hot asphalt mopping over second layer of roofing felt. Completely embed felt seal, lap end joints at least 4", embed top flange of lap in a heavy coat of plastic cement; flange at 3" o.c. Secure lower edge of gravel stop by hooking with clips at 24" centers. Secure sheet metal to underside of eave overhang in an approved manner. Hold end joints together with clips. Face nailing of end lap joints not permitted. Eave and rake intersections shall be neatly fitted or mitered together, and all joints shall be smooth, soldered, cleaned, and primed as specified herein.

7B-12 SCUPPERS

Fabricate per applicable SMACNA Plate as required by job conditions, unless otherwise indicated.

7B-13 GUTTERS

Fabricate and install gutters per SMACNA standards as modified on drawings. Fabricate of minimum 22 gage galvanized steel. Provide approved opening and connection for downspouts, which are specified to be provided under "Plumbing" Section of these specifications. Secure gutters to building and to sheet metal "flashing with slip joint" (as indicated) per SMACNA standards as modified by drawings.

7B-14 FLASHING WITH SLIP-JOINT & SEPARATION JOINTS

Provide flashing with slip-joint and separation joint covers as indicated on drawings (see details 9 and 15 on Drwg. 5-2).

7B-15 PAINTING

- A. Prime coat of paint for ferrous metal shall be zinc-dust-zinc-oxide, all as made by Andrew Brown Company or primers as specified for applicable metals in "Painting and Decorating" Section.
- B. All sheet metal shall be given one job-applied prime coat prior to installation and after inspector has inspected and approved sheet metal work for installation. Before painting, thoroughly clean all metal, removing all flux, etc., as recommended by the approved paint manufacturer whose paints are to be used.

1131-117

SECTION 7C

CAULKING

Requirements of Division 1 apply to work of this Section.

7C-01 SCOPE

Provide all caulking as indicated and specified, complete.

7C-02 WORK INCLUDED IN THIS SECTION

- A. It is intent of Section 7C that Contractor do all caulking (except as excluded in following Paragraph 7C-03, "Work Not Included In This Section") indicated, specified and necessary throughout job as a whole to obtain completed weathertight, watertight and workmanlike structure; all to Designer's satisfaction. Where caulking is indicated on drawings, it is indicative of locations requiring same and it is intent of drawings and these specifications that these items be provided in all similar locations.
- B. Some of building parts requiring caulking are: Around entire perimeter of all openings in exterior walls; under thresholds at exterior entrances; bed joints between plaster and soffits, cornices, metal expansion joints, members projecting beyond face of building, between walls and aluminum store front work, and all other joints where indicated and necessary to fulfill requirements of this Section.

7C-03 WORK NOT INCLUDED IN THIS SECTION

- A. Sheet Metal. Setting of sheet metal work in mastic.
- B. Caulking required for installations on and projections through the roof is specified in "Roofing" and "Mechanical" Sections.
- C. Glass & Glazing and aluminum framed window walls.

7C-04 MATERIALS

Materials shall conform to the following requirements:

- A. Deliver, store and handle materials to prevent inclusion of foreign matter, damage of materials by water, break-

age. Deliver, store packaged materials in original packages until ready for use. Do not use packages or materials showing evidence of water or other damage.

- B. Primer shall be as recommended by manufacturer of approved caulking materials for applicable surfaces.
- C. All Caulking compounds shall be non-staining type of colors as required to accurately match adjacent materials and surfaces and shall be a one-part acrylic to polymer sealer or a one-part polysulphide liquid polymer (Thiokol) base rubber compound which cures at normal temperature to a flexible firm rubber. Use Class A (self-leveling flowable) and Class B (non-sag) in applicable locations as recommended by caulking compound manufacturer whose products are used. Use primers as recommended by approved caulking compound manufacturer. Caulking materials approved for use are:
 - 1. "Lasto-Meric", Tremco Mfg. Co. (distributed by Fry Reglet Company).
 - 2. "PRC Rubber Calk 5000", Products Research Corp.
 - 3. "Weatherban 101 Sealant", Minnesota Mining & Mfg. Co.
 - 4. Use Butyl Flex caulking for inside bead.
- D. Oakum and Rope Yarn. Approved, pickled, not treated, free from tar, oil and other foreign matter.

7C-05

WORKMANSHIP AND APPLICATION

- A. Caulking. Shall be done by experience mechanics using specified materials and proper tools.
- B. Preparatory work (cleaning, etc.,) and application of caulking shall be per approved manufacturer's printed recommendations for required quality of work and materials to which caulking is to be applied.
- C. Preparatory Work.
 - 1. Joints and spaces to be caulked shall be completely cleaned of all dirt, dust, mortar, oil and other foreign materials which would adversely affect caulking work. If recommended by caulking compound manu-

facturer, remove paint and other protective coatings from aluminum, etc., prior to priming and caulking application.

2. Use air pressure or other approved methods to achieve required results.

D. Application.

1. Caulking shall be complete before final coats of paint are applied.
2. Where molds, beads, or back band molds do not form integral part of door frame, remove same caulk and point. Caulk between solid frame and abutting construction.
3. Prime masonry, concrete, and, if so recommended by approved manufacturer, other surfaces before applying caulking. Prime with brush that will reach all parts of joints to be filled with caulking compound.
4. Oakum. Joints and spaces deeper than 3/4" and elsewhere as necessary to provide proper backing for caulking shall be within 3/4" of surface. Fill remaining space with caulking compound.
5. Apply compound with gun having proper size nozzle; use sufficient pressure to fill all the voids and joints solid.
6. In caulking around openings, include entire perimeter of each opening.
7. Neatly point finish of caulking joints in flush surfaces with beading tools; remove excess material.
8. Neatly point finish of caulking joints in internal corners with coving tool; remove excess material.
9. Caulking, where exposed, shall be free of wrinkles and uniformly smooth.

7C-06

CLEANING

All adjoining surfaces, finished floors and fixtures shall be carefully protected through the caulking operations, and any

stains, marks or damage thereto as a result of work of this Section shall be corrected in a manner satisfactory to Designer and without added cost to the Owner.

7C-07 CLEAN-UP AND GUARANTEE

In accordance with applicable articles of the "General Conditions", except that guarantee period shall be five (5) years.

- END -

SECTION 8A

ALUMINUM FRAMED DOORS & FIXED SASH

Requirements of Division 1 apply to work of this Section.

8A-01 SCOPE

Provide all "Aluminum Framed Doors & Fixed Sash", including hinged aluminum framed doors and adjacent fixed glass panels and other related items of work; all as indicated and specified.

8A-02 WORK NOT INCLUDED IN THIS SECTION

Following items of related work specified to be furnished and/or installed in other sections:

- A. Caulking.
- B. Aluminum window walls.
- C. Glass and glazing.
- D. Finish hardware.

8A-03 GENERAL REQUIREMENTS

- A. Job Measurements. Verify at site conditions affecting work of this Section, take field measurements. Report any discrepancies between drawings and field dimensions to Architect prior to commencing work.
- B. Shop Drawings. Submit for approval per "Supplementary General Conditions"; show materials, construction and fabrication details, layout and erection diagrams as required, and method of anchorage to adjacent construction.
- C. Samples, Prior to fabrication or ordering materials, submit 2 samples of door section with anodized finish, and pulls, labeled with name of manufacturer, number or proprietary name, and space in which to be used.

8A-04 MANUFACTURE

- A. Aluminum sections and aluminum framed doors shall be standard product of Kawneer, A.J. Bayer, Rebco, Acme, Arcadia, Huntington, International, or approved equal.

- B. Drawing indicate use of standard details. Installation of product of manufacturers listed herein may require changes in details. Such changes shall provide type and quality of installation intended and shall be clearly shown on shop drawings.

8A-05

MATERIALS AND CONSTRUCTION

- A. Aluminum and exposed fastenings shall be of extruded aluminum sections at least 1/8" thick; glazing moldings shall be at least 0.051" thick. Use Alcoa's Anoclad 11 aluminum alloy for both sheets and extrusions.
- B. All exposed aluminum surfaces including exposed hardware and fastenings, shall be finished in an equivalent to Alcoa's "Duranodic" 312, Medium Bronze, Color; which is an Architectural Class I Anodic Coating with Integral Color, equally to Aluminum Industry Standard Specification C22 A42. Duranodic Color shall be obtained by giving all aluminum sections a caustic etch followed by an Anodic treatment to produce a high density aluminum oxide coating. The minimum coating thickness shall be 0.7 mil (0.0007 in.) when measured per ASTM B-244, and the density shall be at least 32 mg. per square inch when measured per ASTM B-127. The color coating shall then be given a complete seal per ASTM B-126.
- C. Sections, shall be formed true to details with clean, straight, sharply defined profiles and free of defects impairing strength and durability. Sash and entrance units shall be factory assembled, insofar as possible. Doors shall be accurately fitted to jambs. All joints shall be welded or securely fastened with machine screws and backing plates. Narrow-stile doors shall include an adjustable setting block feature. Weathering, as standard with the manufacturer, shall be provided as required.
- D. Welds shall be on the unexposed side, in such a manner as to show a minimum discoloration on the exposed face after grinding and polishing. Weld penetration shall be not less than 60% nor more than 90%.
- E. Exposed fastenings shall be stainless steel, aluminum or other corrosion-resistant material, colored to match parent metal.
- F. Structural steel bracing members, as indicated, and/or required by job conditions, shall conform to applicable

requirements of "Miscellaneous Metal" Section. Members shall be furnished complete with all fastenings as required for a complete installation.

- C. Dissimilar Materials. Where aluminum is in contact with other metals, concrete, concrete block or plaster, the contact surfaces of the aluminum shall be painted, before erections with heavy coat of bituminous paint of good brushing consistency, equivalent to "Bitumastic" by Koppers Co.

8A-06

INSTALLATION

Storefront and window units shall be installed per selected manufacturer's approved shop and installation drawings and written instructions. Installation shall be by fully qualified workmen skilled in this type of work. All work shall be set square, plumb, level and at proper elevation. Units shall be securely anchored.

8A-07

CLEANING

All aluminum shall be thoroughly cleaned just prior to final acceptance of building by Owner. Use plain water or a petroleum product, such as white gas, kerosene or distillate. No abrasive cleaning agents shall be used. As work progresses and at its completion, Contractor shall remove scaffolding, equipment, materials and debris and leave site broom clean.

8A-08

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Aluminum Framed Doors & Fixed Sash Work required therefor.
- B. Attention is called to Section 1E of these Specifications.

- END -

SECTION 8B

ALUMINUM WINDOW WALL

Requirements of Division 1 apply to work of this Section.

8B-01

SCOPE

Provide all aluminum window wall indicated and specified including fabrication, erection, sealing, glazing, and testing. Principal items of work includes:

- A. All aluminum vertical and horizontal framing and vent members. Window washer bolts as indicated.
- B. All clips, supports, fasteners, cast in place anchors (furnish only) required to assemble and securely hold the wall in place.
- C. Aluminum sills, closures, coping, and all other metal parts necessary for a complete installation of this section.
- D. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job 1000 - St. Francis Addition Finish Schedule" are herewith made a part of this specification. Finish schedule books can be seen in Contractor's jobsite office.~~
 1. Provide antique bronze finished window frames as specified on page MET-2 of Volume 2.
- E. Erection and sealing (caulking).
- F. With exceptions listed in following "Work Not Included In This Section" article, provide all color anodized aluminum work indicated on drawings and specified herein, including:
 1. Bronze anodized aluminum bars between air intake and Carriage Drive Entrance.
 2. Bronze anodized aluminum panels at Cashiers Room (Carriage level) on metal studs as indicated.
 3. Extruded bronze anodized aluminum frame at air diffusers (see detail 8 on drawing 9-7) for aluminum

window wall work and for steel window installations. Plywood panel is specified to be provided under "Carpentry and Millwork" Section.

4. Bronze anodized aluminum plate at wood rail in Sky Bar.
5. Bronze anodized aluminum "fence" around passenger elevators. (See drawing 2-12) and at air shaft on 4th floor.

8B-02 WORK NOT INCLUDED IN THIS SECTION

- A. Setting of all angle bolts and clips set in concrete for support of window wall units.
- B. Following sections and all other pertinent sections shall be carefully studied to ascertain the items of related work specified to be provided therein:
 1. "Architectural Metal Work".
 2. "Aluminum Framed Doors".
 3. "Steel Windows".
 4. "Marble Work": Black anodized aluminum trim pieces at corners of marble panels in Lobby (see drawing 6 - 8, detail 6) are specified therein.
 5. "Glass and Glazing": Glass and glazing, including Spandrel glass is specified to be provided therein.

8B-03 MANUFACTURE

Details shown on Architectural drawings and specified herein are based on material and method of fabrication used by Soule" Steel Company. These shapes, materials and methods are indicated to establish type, materials, and quality required. Products of other approved fabricators will be acceptable subject to Architect's approval obtained per requirements of "Project General Requirements" section, shall be the basis for the "Base Bid".

8B-04 MATERIALS

- A. All material forming the exposed surfaces shall be the product of one aluminum producer.
- B. Aluminum extrusion and sheet material shall be specifically manufactured for this project. All alloys shall be closely

Aluminum Window Wall

controlled in chemical composition so as to obtain the proper color finish from the process treatment: specified.

- C. All fasteners in contact with aluminum shall be stainless steel or, if not exposed to moisture, plated with other metals compatible with aluminum.
- D. Aluminum in contact with dissimilar metals shall be separated with tape, zinc chromate primer (JAN-P-735) or bituminous paint (MIL-P-683).
- E. All steel reinforcing or anchors shall be standard grade structural ASTM A-7. If porcelain enameled, ASTM A-245 or A-366.
- F. Caulking for exterior shall be Thiokol based material equal to Products Research Corporation's "5000 Rubber Calk Sealant" or equal by Pecora or 3M, or silicon based material by General Electric. Backing material shall be foamed urethane.
- G. All pressure gaskets shall be neoprene.
- H. All extrusions except snap-ons shall be a minimum of .125 thick.

8B-06 INTERIOR SPANDREL PANEL

Interior face of spandrel shall be aluminum. "Aluminum Panel" shall be bronze anodized aluminum of sufficient thickness to eliminate oil canning and insulated in manner as to provide a "U" factor of 0.15 B T U per hour per square foot. Provide for steel windows and aluminum window wall work including Sky Bar level.

8B-07 DESIGN AND CONSTRUCTION OF WALL

- A. Performance:
 - 1. Design window sections to withstand wind loads per San Francisco Building Code. Anchors shall be properly spaced and calculations submitted by licensed structural Engineer.
 - 2. Provision shall be made for movement of structure due to earthquakes in a manner independent of windows.

3. Anchorage of mullion shall be such as to carry loads associated with use of window washing bolt attached to mullion.

B. Design: All profiles indicated on drawings shall be maintained. Vertical muntins shall be kept to minimum.

C. Ventilators:

1. All ventilators shall be minimum of 1-1/2" deep with tubular sections mitered with flash welded corners and mechanically fastened.
2. Vent shall be weathered with vinyl on inside.
3. Glazing shall be done on inside with snap in square extruded glazing beads.
4. Air infiltration of ventilators shall not exceed 0.5 cubic feet per minute per foot of crack perimeter.

8B-08 HARDWARE

- A. Ventilators shall be hung on extension hinges to allow for cleaning from inside.
- B. Ventilators shall be operated with roto operation with a built-in limit such as Soule" 9P-21 M heavy duty operator with magnetic limit stop. Limit to be set for 4" opening. All hardware, including window cleaning bolt and roto operators shall be given Bronze Finish to harmonize with window finish.

8B-09 TESTING FINISH AND MOCK-UP

Tests shall be made as required by Section 1C "Tests and Inspections".

8B-10 MOCK-UP HURRICAN TEST

Contractor shall prepare mock-up of typical unit, usable on typical floor of building.

built-in limit such as Soule' 9P-21 M heavy duty operator with magnetic limit stop. Limit to be set for 4" opening. All hardware, including window cleaning bolt and roto operators shall be given Bronze Finish to harmonize with window finish.

8B-09 TESTING FINISH

Test report showing finish thickness shall be made by independent laboratory, from production color runs, 3 times during coloring process. Manufacturer shall also run 3 thickness tests per day and shall submit these test reports to Designer.

8B-10 MOCK-UP HURRICANE TEST

Contractor shall prepare mock-up of typical unit, usable on typical floor of building.

8B-11 TESTING MOCK-UP

- A. Mock-up shall be erected in hurricane type and wind test facility supported in same manner as detailed for support on building.
- B. Wind loading supplied shall be slip stream velocity of 100-110 miles per hour (equivalent to 30 pounds per square foot) and shall be accompanied by impact and cooling effect of 2-1/2 gallons of water per hour per square foot of exposed area under test, ejected at 20 to 25 pounds pressure. Mock-up shall show no evidence of leaks when subjected to this wind and water test for 10 minutes.
- C. Contractor shall furnish Designer with report from an independent testing laboratory certifying compliance with above test.

8B-12 GUARANTEE

- A. Contractor shall guarantee that all work conforms to specifications and drawings, as modified and amended, except for reasonable variances not impairing the usefulness thereof, and is not defective in workmanship or materials. That liability under this warranty is limited to repair or replacement, during year period following date of final acceptance by Owner of entire property, of any of its work that has proved to be defective in workmanship or materials during such period.

8B-11

GUARANTEE

- A. Contractor shall guarantee that all work conforms to specifications and drawings, as modified and amended, except for reasonable variances not impairing the usefulness thereof, and is not defective in workmanship or materials. That liability under this warranty is limited to repair or replacement, during year period following date of final acceptance by Owner of entire property, of any of its work that has proved to be defective in workmanship or materials during such period.
- B. If exploratory work is required to determine the cause of defects, the cost of such work shall be borne by this sub-contractor, only in case his work is found to be at fault; otherwise this sub-contractor shall be reimbursed his direct costs only, which shall not include his overhead, for any such expense.

8B-12

ERECTION

Erection shall be per requirements specified herein, as indicated on drawings (including approved shop drawings) and window wall fabricator's written instructions and recommendations for this project.

- END -

- C. Finish painting is specified to be provided under "Painting" Section.

7B-16

INSPECTION

- A. Designer shall have free access to all work in shop and/or on project for examination and inspection of fabricated and completed work.
- B. Before completing the work, Contractor and Designer shall carefully examine and, if necessary, test all sheet metal work and equipment specified herein. Contractor shall make all repairs to damaged work and work not approved, leaving it in a condition satisfactory to Designer.

- END -

SECTION 8C

GLASS AND GLAZING

Requirements of Division 1 apply to work of this Section.

8C-01

SCOPE

With exceptions listed in following article entitled "Work Not Included In This Section", all glass and glazing and all mirrors indicated on the drawings and specified herein; including, but not limited to following:

- A. All glass and glazing, including spandrelite.
- B. Mirrors and glass shelves.
- C. ~~See Volumes 1 and 2 of books compiled and printed by Western Service and Supply Company, (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 St. Francis Addition Finish Schedule" for glass, glazing, mirrors, and glass shelves required thereby to be provided under this Contract. Copies of these books and applicable approved samples, can be seen in Contractor's jobsite office.~~

8C-02

WORK NOT INCLUDED IN THIS SECTION

Following items of related work are specified to be furnished and installed or furnished for by Owner or under other sections of this specification:

- A. See above referenced Volumes 1 & 2 of "Finish Schedule" for items of related work to be furnished and installed or furnished by Owner for installation under Section 8C.
- B. "Blenco Glass" in "Decorative Hood" (See page Misc.-2 in Volume 2) is specified to be provided under "Architectural Metal Work" section.
- C. Interior aluminum framed, insulated spandrel panels are specified to be provided under "Aluminum Window Wall" Section.

8C-03 SAMPLES

Submit samples of each type glass required, to Designer per "Supplementary General Conditions" Section. Samples shall be identified by manufacturers' identification labels thereon.

8C-04 GLASS AND GLAZING

A. Materials:

1. Manufacture. Materials under this section shall be products of Pittsburgh Plate Glass Co. (PPG), Libbey-Owens-Ford Glass Company (L-O-F), Mississippi Glass Company, or approved equal.
2. Grading Labeling. Glass shall conform with Federal Specification DD-G-451. Each light of glass shall bear manufacturer's label, giving name of manufacturer, quality and manufacturer's brand designation, weight or thickness. Absence of label will constitute cause for rejection. All labels shall remain on glass until glass has been set, inspected and removal by Designer. If glass is not labeled, Designer may require affidavit signed by manufacturer's authorized glass distributor and Contractor, certifying compliance to specifications.
3. Polished Plate Glass shall be L-O-F's 1/4" thick, clear Parallel-O-Plate and is required for interior glazing with exceptions specified or indicated.
4. "Solar-Bronze" shall be PPG's and is required where indicated.
5. Wire Glass shall be Mississippi Glass Company's 1/4" thick (at thinnest point) Polished Misco and shall be listed by Underwriters Laboratories, Inc., as having fire rating required by building code and Fire Marshal's office. Required in steel windows, where indicated and required by code, and elsewhere as indicated.
6. "Wissmach #48" window glass in Coffee Shop Lobby (see page MISC-3 of Finish Schedule Volume 2) shall match approved sample in Designer's office.

7. Tempered Plate glass (identified on drawings as "Heat Treated" as well as "Tempered") shall be L-O-F's "Tuf-flex Tempered Polished Plate Glass", clear or "Solar-Bronze" and of thicknesses indicated, unless greater thicknesses is required by building code.
8. Spandrel glass shall be PPG's "Spandrelite" of thicknesses indicated and "Solar-Bronze" color matching (in Designer's opinion) other bronze colored glass used for exterior window wall. All spandrel glass shall be Harmonizing Spandrelite glazed in accordance with the Federal Specification DD-G451A. Each light delivered for installation shall have the manufacturer's label affixed showing quality brand and grade.
9. Safety glass shall be PPG's "Duplate", or approved equal, of thicknesses indicated.

B. Glazing:

1. Glazing shall be performed per approved glass manufacturer's recommendations and applicable standards and specifications of current edition of Glazing Manual of the Flat Glass Jobbers' Association as minimum requirements. Greater requirements specified herein shall be complied with.
2. Unless otherwise provided, perform work on site. Use skilled glaziers. Verify all sized before cutting. Cut and fit with tolerances per approved glass manufacturer's recommendations and the aforementioned "Glazing Manual". Set tight and true within rebates, using required springs, shims, points or glazing clips at intervals frequent enough to prevent looseness or rattling.
3. Glass shall be set without springing.
4. Spandrel glass shall be installed per manufacturer's (whose glass is used) current written instructions and recommendations for this project.

C. Glazing Sealant. "Mono-Lasto-Meric" by Tremco Mfg. Co. or Architect-approved equal.

1. Sealant Colors. To closely match adjoining work as approved by Designer. Submit samples of each color required.
2. Delivery. In manufacturer's unopened containers.

8C-05

MIRRORS AND SHELVES

Mirrors shall be types, quality and sizes indicated on the drawings, specified herein, and noted in Volumes 1 and 2 of aforementioned "Finish Schedule".

- A. Plastic mirrors with antique finish shall match approved samples in Designer's office. (See pages MISC.-4 and MISC.-6 in Finish Schedule Volume 1.)
- B. Mirrors not otherwise indicated, listed in "Finish Schedule Volumes", or specified shall be Polished plate glass, mirror-glazing No. 1 quality, minimum 1/4" thick, conforming to CS-27; backed with two coats of chemically applied silver with electrolytic copper coating (.0002" thick), followed by two protective coats of clear varnish or shellac applied to silvered and coppered surface and to all mirror edges, followed by final coat of mirror backing paint.
 - 1. Unframed mirrors shall have all edges ground and polished, and shall be supported on bottom by stainless steel channels or other approved methods.
- D. Glass shelves shall be as indicated, specified, or listed in "Finish Schedule Volumes". Unless metal framed, all edges shall be polished and rounded.
- E. Stainless steel framed mirrors and stainless steel shelves shall be equal to Tyre Brothers Glass Co.'s 10 year guaranteed Register Safety Mirrors and SS-A stainless steel shelves Type 302 stainless steel with No. 4 finish.
- F. Install mirrors and shelves per drawing requirements (including approved shop drawings) and manufacturer's written recommendations and instructions for this project.

8C-06

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Glass, Glazing and Mirror Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 8D

HOLLOW METAL DOORS AND FRAMES

Requirements of Division 1 apply to work of this Section.

1. SCOPE

Provide Hollow Metal Doors and Frames as indicated and specified, complete.

2. GENERAL REQUIREMENTS

a. Job Measurements. Verify at site all conditions affecting the work. Obtain accurate dimensions of openings, floor grades and levels, and location and arrangement of all embedded bolt anchorages required.

b. Shop Drawings. Submit to Designer for approval, per "Shop Drawings & Samples" section.

3. MATERIALS AND CONSTRUCTION

Metal doors and frames to be as manufactured by Overly, Security, Kreiger Steel Products Co., C.L. McCluney, Inc., or other approved manufacturers. For items not indicated or specified, minimum acceptable standard of quality shall be as defined in "Specifications for Hollow Metal Doors" as published by Overly Manufacturing Company.

a. Use best quality stretcher-leveled full pickled and double-annealed cold-rolled furniture steel, of U.S. Standard gauges hereinafter specified. Rough bucks, reinforcements and other concealed members shall be formed of good commercial quality mild steel sheets and bar or flat stock as required.

b. Finish work shall be smooth and free from warps, buckles, weld marks. All miters and moldings shall be accurately formed and in true alignment.

4. HOLLOW METAL DOORS

A. Type: 1-3/4" thick, flush.

B. Fabrication: Construct of two plates, cold-rolled, stretcher leveled, formed steel, not less than 18 gauge. Assemble with

interlocking "Z" bars or channels, not less than 18 gauge, spaced 8" apart, maximum. Reinforce top, bottom and both edges according to manufacturer's standards, top edge of exterior doors flush. Provide bottom edge reinforced recess to receive drop door bottoms where designated or required.

C. Sound Deadening: Construct all parts of door free from metallic ring and insulate according to manufacturer's standards.

D. Hardware Reinforcement: Provide for all mortise door hardware; mortise, reinforce (9 gauge for butts, 12 gauge for locksets), drill and tap doors in accordance with templates or physical hardware furnished by hardware supplier. Provide minimum 12 gauge reinforcement plates for all surface applied hardware.

E. Cut-Outs: As required by door details and/or schedules, provide uniformly located openings for louvers and glazing. Finish flush with door face. Provide fixed and fitted, attached removable units as necessary.

(1) Louvers to be of 18 gauge furniture steel, inverted "V" type, unless otherwise indicated. Louver frame to be reinforced and welded to door. Provide insect screens on all exterior door louvers.

(2) Cutouts for glazed openings shall be provided with glazing mold forming integral part of door on exterior side. Interior glazing mold shall be removable for glass installation; mold shall be secured with ovalhead sheet metal screws not over 10" o.c. All glazing mold to finish flush with face of door.

F. All doors in mechanical rooms shall have Penko Mfg. Co.'s #375-AR extruded anodized aluminum door weatherstripping with neoprene.

5. HOLLOW METAL (PRESSED STEEL) FRAMES

A. Type: Use only welded-type frames. Provide complete with fixed and fitted, attached removable stops.

B. Fabrication: Use cold-rolled stretcher-leveled furniture stock steel, free of defects impairing strength or appearance, 16 gauge except as otherwise indicated or required by code.

(1) Accurately fabricate with surfaces free of warp, wave, buckle, or other defects. Connect joints by continuous welding, exposed welds ground smooth and flush. Reinforce heads over 42" wide with 12 gauge steel channel.

(2) Fabricate and erect within tolerance of plus or minus 1/16" of scheduled dimension and plumb, square and free of bow and twist.

- C. Hardware Reinforcements: Obtain templates from hardware supplier, and coordinate hardware placement with other trades. Provide cut-outs and welded concealed steel reinforcements for hardware, using minimum 3/16" gauge for butts, 12 gauge for lock and 14 gauge for surface applied items. Provide galvanized sheet metal plaster guards back of all cut-outs in frames and install nuts furnished by other Sections. Maximum 3/64" tolerance allowed in placing hardware.
- D. Anchors: Types suitable for wall construction, 3 per jamb and floor clips, with 2 anchors for each head over 42" wide. Use galvanized anchors and fasteners.

6. LABELS

Hollow metal doors and frames, in locations indicated, shall bear correct U.L. label as indicated or as required by governing codes whichever requirement is higher.

7. SHOP COATING AND PRIME FINISH

Clean all surfaces before finish is applied. Doors, frames, metal louvers and panels shall have a factory applied baked prime coat. Give all inaccessible surfaces a coat of rust inhibiting paint before assembly. Sand and fill exposed surfaces, as required, and apply one coat of primer as standard with manufacturer. On doors and frames designated to receive cladding applied by other trades, eliminate primer, but carefully protect from damage or moisture and deliver in condition fully acceptable to receive cladding.

8. INSTALLATION

- A. General: Install work per manufacturer's approved shop drawings. After installation, clean all work, adjust for freedom from binding, and assure proper operation.
- B. Frames: Install plumb, straight, in true alignment and rigidly connect to walls and building construction. Erect in proper sequence with work of other trades to prevent delays. Provide closures, cover plates and accessories indicated for sidelights; construct a completely waterproof assembly. Erect within tolerances specified.

- C. Finish Hardware: Install finish hardware on Hollow Metal Work as furnished under Section "Finish Hardware", except items specified to be installed under other Sections. After installation and fitting remove all finish hardware, tag and box, and reinstall after completion of painting. Adjust and leave in perfect working condition.
- D. Glass and Glazing: Perform work in accordance with applicable requirements of Section, "Glass and Glazing".

9. CLEANING

Leave all parts washed clean and free from oil, grease or other foreign matter and acceptable to receive work of other trades. Remove all debris, packaging and excess material resulting from work from job site, and leave areas of work broom clean. Repair any damage to Designer's satisfaction and at no additional cost to Owner.

10. ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Hollow Metal Doors & Frames required therefor.
- B. Attention is called to the drawings and to Section 1E of these Specifications.

- END -

SECTION 8E

FINISH HARDWARE

Requirements of Division 1 apply to work of this Section.

8E-01 SCOPE

Install all Finish Hardware, including decorative type hardware, as indicated, specified, and furnished by Owner, complete and operable.

8E-02 INSTALLATION OF FINISH HARDWARE

- A. Receive, store, and install all Owner furnished hardware.
- B. Accurately fit and install all finish hardware. Execute installation without marring or injuring of work.
- C. If surface-applied hardware is fitted and applied before painting, remove all such items, except butts, and reinstall same after painting work is completed.
- D. Set exterior door thresholds in mastic. Anchor with machine screws secured in lead expansion shields.
- E. Examine hardware at work completion; test, oil, grease, ease and adjust hardware for perfect operation.
- F. Handle hardware items carefully; keep free from scratches, dents or other defacements. Cover knobs, handles and the like, until completion of painting and finishing work.
- G. Install Key Board furnished by Owner. At completion turn keys over to Owner hung on key board in proper place.

- END -

SECTION 8F

WOOD DOORS

Requirements of Division 1 apply to work of this Section.

8F-01 SCOPE

Provide all wood doors as indicated and specified, including:

- A. Solid core wood doors.
- B. "Dutch" type doors, complete with shelves.
- C. Plastic-laminate covered wood doors.
- D. Wood louvered doors.
- E. Applied carved wood moldings and trim as indicated.
- F. Mineral core type fire-rated wood doors.
- G. Hinged, sliding, and folding type wood doors.
- H. Wood doors in "Porthole" openings as detailed.
- J. ~~See Volumes 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" for species, types, and quality of doors, including veneers, plastic-laminate-covered doors, finishes, and other items pertaining to work required under Section 8F. These books can be seen in Contractor's jobsite office.~~
- K. NOTE: Wood door frames and installation of wood doors is specified to be provided under "Carpentry and Millwork" section of this specification.

8F-02 WOOD DOORS

- A. Wood doors shall be U. S. Plywood Corp.'s solid core "Weldwood Staved Lumber Core" doors of materials, types, sizes and thicknesses indicated on drawings and specified herein and shall meet or exceed requirements of U. S. Commercail Standard CS 171-58 (including all amendments)

and as set forth in applicable U. S. Plywood's "long form door specifications." Doors meeting requirements specified herein as made by Weyerhaeuser Co., Strait Door & Plywood Corp., or other approved door manufacturers, will be acceptable.

- B. Exterior doors shall be manufactured with Type I exterior resin glue applied by hot plate press method.
- C. Doors shall be 7-ply veneered as indicated on drawings and specified herein. Veneer shall be minimum 1/26" thick before sanding.
- D. Edge strips shall be either maple or birch and shall be a minimum 3/4" thick. Side edge strips shall be hardwood or softwood 1" thick (minimum). Top and bottom edges of doors shall be given two coats shellac prior to leaving factory.
- E. Openings shall be made for glass by door manufacturer. Provide at glazed openings approved type moldings of same species as face veneer.
- F. Door manufacturer shall furnish and install required metal louvers which shall be Airo-lite Co.'s inverted "V" blade, Type No. 685-A-8 or approved equal as made by Aluminex, Inc. (Los Angeles, Calif.). Molding shall be as indicated or, if not indicated, as selected by Designer. Shop prime louvers and moldings with an approved rust-inhibitive paint.
- G. Fire doors shall have incombustible mineral core tightly fitted with tongue and groove joints. Doors to be labeled per Underwriters' Laboratories, Inc., for rating required and shall bear Underwriters' label.
- H. Warp and twist of the door will be considered a defect only where it exceeds 1/4 inch. Standard procedure as set forth in CS-171, paragraph 3.8, shall be used to determine the extent of warp and not relation of door to frame.
- J. Make ample provisions for shrinking and/or swelling of all wood.
- K. Where necessary to cut and fit on the job, make ample allowance for such cutting.

- L. Applied trim and moldings shall be as indicated on drawings, including approved shop drawings, and shall match (in Architect's opinion) approved samples.
- M. Plastic laminate covered doors shall be of same construction as specified herein for solid core doors with following exceptions:
1. Use 1/8" tempered hardboard crossbanding over core.
 2. Plastic laminate shall be Formica brand unless otherwise required by Volumes 1 or 2 of "Finish Schedule". Plastic laminate shall be at least 1/16" thick. Where decorative type plastic laminate is required by aforementioned Volumes, opposite face of door shall have 1/16" General Purpose Grade - 10 plastic laminate applied thereto.
 3. Edge Banding: Where doors are not required to have plastic laminate edge banding, top, bottom and side edges shall be "Woodlife" water-repellant treated and coated with 2 coats of an approved Spar Varnish. NOTE: Where staining is required on such surfaces, staining shall be applied prior to varnish. Staining is specified to be provided under "Painting" section of this specification.
- N. Wood Louvered Doors and Panels. Stile and rail type, fabricated of premium birch (unless other species woods are required by drawings or "Finish Schedules"), with stiles and rails of selected kiln-dried stock and louvers of solid stock. Doors shall conform to Woodwork Institute of California (WIC) Section 20 of Manual of Millwork, 1969 edition, for stile and rail construction. Doors shall be of size and thickness scheduled.
1. Stiles and rails shall be blind mortised and tenoned or double doweled at joints and full glued.
 2. Slats shall be 1/4" thick, dapped into stiles. Provide small mold to cover daps.
 3. Stiles, rails, louvers, and moldings shall be smoothly sanded.

- O. Dutch-door shall be as indicated. Fabricate shelf of indicated or specified hardwood, or, if not indicated or specified use select white birch or other approved hardwood, 1-1/2" thick. Center shelf on door as indicated. Round and smooth all edges. Secure as indicated. Shelf shall be level and at right angle to adjacent walls.
- P. Wood panelled doors shall be as indicated. Doors and moldings shall be carefully cut and fabricated to conform to millwork standards for Premium grade millwork as established by Woodwork Institute of California.

8F-03 GUARANTEE

Submit, per "Project General Requirements" section, written guarantee against defective materials and workmanship (for a period of two years after date of acceptance) that render the doors unserviceable or unfit for intended use.

8F-04 ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Wood Door Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 8G

STEEL WINDOWS

Requirements of Division 1 apply to work of this Section.

8G-01 SCOPE

Provide all steel window work as indicated and specified, complete. Principal items of work include:

- A. Steel windows, ventilators, mullions, and covers on and around window work.
- B. Operating hardware, including window operators.
- C. Window washing bolts as indicated.
- D. Finish painting.
- E. NOTE: Glass and glazing, including spandrel glass, is specified to be provided under "Glass and Glazing" Section and interior aluminum panels for steel windows are specified to be provided under "Aluminum Window Wall".

8G-02 SHOP DRAWINGS AND SAMPLES

Submit shop drawings and samples per requirements of "Supplementary General Conditions" section.

- A. Submit complete shop drawings for approval before fabrication. Indicate complete details and installation conditions.
- B. Submit sample of each item of hardware, and sample of "made up" window corner section.
- C. Submit color samples of finish paint.

8G-03 MATERIALS AND CONSTRUCTION

- A. Details indicated on drawings and specified herein are based on steel windows as made by Druwhit Metal Products (Anaheim, California) to establish type, materials, finish, and quality required. Windows as made by other approved manufacturers will be acceptable subject to requirements for substitutions set forth in "Supplementary General Conditions" Section.

- B. Sections shall be hot-rolled, new billet steel bars, especially designed for steel windows. All frame members shall not be less than 1-1/4" deep and all ventilator members less than 1-1/2" deep with the combined weight of frame and vent not less than 3.6 lbs. per lineal foot. Steel windows shall be as manufactured by DRUWHIT METAL PRODUCTS 360 Series as specified herein. Ventilators shall not be less than 50% of the combined weight of frame and vent members.
- C. Frame members shall be one-piece unequal leg sections. Frame corners shall be mitered, electrically welded and finished smooth. Windows shall be manufactured to meet San Francisco building and fire codes. Windows shall be arranged for inside steel snap-on glazing bead.
- D. Open-out side hinged ventilators shall be hung on heavy steel extension hinges equipped with brass-brushed pivots.
- E. Provide 2 number 2862 fasteners and 1 number 2851 pull at each ventilator. Hardware shall be solid brass with US10 finish.
- F. Window washing bolts shall be as indicated. Anchorage of mullion shall be type which will safely carry loads to be required by window washing bolts and use for which they are intended.
- G. Air infiltration of ventilators shall not exceed 0.5 cubic feet per minute per foot of crack perimeter.
- H. Windows shall bear 3/4 hr. fire rating label as required by code.

8G-04 WEATHERSTRIPPING

All ventilators shall be equipped with applied neoprene weatherstripping of type necessary to fulfill required guarantee.

8G-05 FINISH

After fabrication of windows shall be thoroughly cleaned, primed and finish painted with "Drucoat", color to be as selected by Designer to match bronze anodized aluminum windows. To assure uniformity, the entire process of cleaning, prime coat and painting shall be continuous and automatic, without manual handling.

8G-06

ERECTION

Erection shall be per requirements specified herein, as indicated on drawings (including approved shop drawings), and window manufacturer's written instructions and recommendations for this project.

- END -

SECTION 8H

METAL ROLL-UP DOORS AND GRILLES

Requirements of Division 1 apply to work of this Section.

8H-01 SCOPE

Provide all metal roll-up doors and grilles indicated and specified, complete and operable in all respects.

8H-02 SHOP DRAWINGS

Provide shop drawings and details for Designer's approval per "Supplementary General Conditions" section.

8H-03 MANUFACTURE

Overhead grille and doors shall conform to requirements specified herein and indicated on the drawings, including approved shop drawings. Grilles and doors are as specified herein to establish type, materials, quality, operation, finish and other requirements and not to limit competition. Grilles and doors meeting these requirements as made by Cookson Company, Kinnear Mfg. Co., Pacific Rolling Door Company, or Cornell Iron Works, will be acceptable subject to Architect's prior approval.

8H-04 ROLL-UP GRILLES (SECURITY GATES)

In locations indicated, provide Kinnear Mfg. Co.'s "Hex-Art Design" rolling grilles coiling on heavy steel barrel journal- ed in cast-iron brackets and traveling in extruded aluminum guides fitted with rigid vinyl. Mount guides at sides of openings. Barrel to encase steel helical oil-tempered counter- balance spring with necessary safety factor.

A. Grilles are identified on drawings as "Security Gates". There are 2 types required, galvanized steel and bronze anodized aluminum. Grilles identified on "Door Schedule" (on drawings) as "L" grilles shall be galvanized steel and "M" grilles shall be bronze anodized aluminum (Alcoa's Duranodic 312E Medium Bronze).

1. Steel grilles to consist of horizontal 5/16" round steel galvanized bars, spaced not to exceed 1-5/8" o.c.; joined by pressed galvanized steel links at intervals of 9 inches.

2. Aluminum grilles to consist of horizontal 5/16" round aluminum bars spaced not to exceed 1-5/8" o.c.; joined by aluminum links at intervals of 9 inches.
 3. End links of both steel and aluminum grilles to be engaged in guides of extruded aluminum in manner to prevent grille from leaving guides under pressure.
- B. Electric operators shall be Kinnear's Type "C". Motor shall be high starting torque, hoist type, and shall be of size required for door operating speed of one foot per second. Unit shall be controlled by momentary contact 3-button, push-button station ("open", "close" and "stop"), and an automatic screw type limit switch which will break the circuit at termination of travel. High efficiency worm gearing in an oil bath shall be furnished together with spring-set solenoid operated brake completely housed, and magnetic reversing contactor in NEMA Type 1 enclosure. Provide emergency hand crank operator (removable type) which does not affect timing of limit-switch to operate door in case of power failure or removal of motor for servicing. Operator shall transmit motion to door without shock and automatically release motor from driving unit prior to stalling. Provide an overload protective device to break control circuit; device shall be both heat and power operated.
- C. Grilles to be face mounted on steel supports in accordance with Kinnear's standard mounting of this type.
- D. Grilles to be complete and operable in all respects; provide Kinnear's standard Security Cylinder Lock, master key to buildings master key system.

8H-05

STEEL ROLL-UP DOORS, FIRE-RATED

- A. Provide Underwriters' Laboratories Class B (1-1/2 hour rating) and Class A (3 hour rating) steel roll-up doors in locations indicated on drawings. These doors shall be The Cookson Co.'s "Service Fire Doors" Type FD-1 "push-up", or approved equal as made by Kinnear Mfg. Co. or other approved manufacturers. Operation shall be manual. Doors shall have automatic closing device and governor regulating "drop" speed. Doors shall have 160° F. fusible link control.

- B. Curtain shall be made of galvanized steel slats and end-locks as required by U. L. specification. Reinforce top slat; bottom bar to be two steel angles back to back.
- C. Guides shall be fabricated from not less than 3/16" angles bolted at 12" o.c.
- D. Brackets to be of minimum 5/16" thick steel plate and shall have ball bearings.
- E. Counterbalancing mechanism shall be helical torsion springs enclosed in a barrel.
- F. Hood and flame baffle to be as required by U. L. Specifications.
- G. Finish: Curtain to have baked grey acrylic primer. All other exposed surfaces shall be given a factory applied prime coat.

8H-06

ERECTION

All grilles and doors shall be erected by manufacturer's representatives in accordance with manufacturer's current written recommendations and instructions for these types installations; with exceptions specified herein and indicated on drawings, including approved shop drawings. Grilles and doors shall be secured in place and in perfect operating condition.

- END -

SECTION 8J

AUTOMATIC DOOR CONTROLS

Requirements of Division 1 apply to work of this Section.

8J-01 SCOPE

Provide all automatic door controls and operators as indicated and specified, complete and operable in all respects. Principal items of work include: ...

- A. Provide Stanley "MAGIC-DOOR" controls and operators, accessories and hinges for all doors requiring "MAGIC-DOOR" Operators, as shown on drawings and in accordance with approved shop drawings, wiring diagrams, instructions and specified herein.

8J-02 WORK NOT INCLUDED IN THIS SECTION

- A. Doors, frames, locks and cylinders, push & pull bars, and their installation.
- B. Electrical material and installation.
- C. Preparing and forming recesses for operators and setting recess frames for carpet recess and pump unit pits.
- D. Backing Plates.
- E. Air Supply and Plumbing.

8J-03 GENERAL INFORMATION

- A. Examine all parts of work for any conditions which may affect proper and required operation of doors, and verify that all corrections are made before proceeding with work.
- B. Delivery of materials shall be arranged so that supplies on job site will allow uninterrupted progress of work.
- C. Co-operate with all other trades involved in work in placing, building and embedding into work under this section all anchors, sleeves, inserts and miscellaneous items of every description to extent necessary for proper and secure installation.

8J-04 DOOR CONTROL SYSTEMS

- A. Operators and controls shall be as manufactured by Stanley Works, New Britain, Connecticut, or approved equal as made by Kawneer. Stanley operators shall be used where drawings indicate automatic door controls.
- B. Installation shall be by an installer approved by automatic door operator manufacturer. Installation shall be per these specifications, drawings (including approved shop drawings and wiring diagrams) and manufacturer's written instructions and recommendations for this project.

8J-05 MATERIALS - PNEUMATIC OPERATORS

- A. Operator shall be Stanley, heavy duty, Pneumatic operator with large power cylinder, air pressure regulator set and low voltage control circuit in standard case.
- B. Magic Carpets (operated on 24 volts) shall be moulded seamless units of plastisol with both opening and safety sections for each door.
- C. Recess Carpet Moulding to provide for carpet and carpet frame installation. All carpet edges to be covered and protected from external exposure.

8J-06 MATERIAL AND EQUIPMENT SELECTION CHART

PNEUMATIC EQUIPMENT

01BC-14"	Stanley Heavy Duty Pneumatic Operator, for single doors.
0-11B (307721)	Stanley Heavy Duty Pneumatic Operator for pair of doors with concealed pivot shaft and emergency release.
EC-2845	Magic Carpets.
EC-2836	Magic Carpets
P-70-CC	Rails, complete with floor fittings and accessories.

- END -

SECTION 9A

METAL STUDS, LATHING AND PLASTERING

Requirements of Division 1 apply to work of this Section.

9A-01

SCOPE

Provide metal studs, lathing and plastering, including ornamental plaster work as indicated and specified, complete.

9A-02

GENERAL REQUIREMENTS

- A. Acceptance of Work of Others. Examine all parts of work for any conditions which may affect soundness or correctness of lath and plaster work; make all corrections before proceeding with work. Application of any materials under this section shall be construed as acceptance by Contractor of suitability of all materials and substrates to receive work under this section. Contractor shall remove his materials and replace same at no additional cost to Owner to correct such hidden defects.
- B. Deliver all materials in original containers or bundles bearing manufacturers' name and brand; store on platforms above ground. Store aggregates on clean platforms in manner which will exclude dirt and other foreign materials which would adversely affect plaster.
- C. Cooperate with all other trades involved in work in placing, building, and embedding into "Metal Studs, Lathing and Plastering" work, all fixtures, anchors, sleeves, inserts and miscellaneous items of every description, including, providing openings, chases, etc., to extent necessary for proper and secure installation, attachment and passing of their work; all subject to Designer's approval. Before starting work of this section, all piping, conduit, fixtures, etc., which are to be concealed by and/or penetrate plaster must be in place, tested and approved.
- D. Scaffolding: Construct and maintain in conformity with applicable laws and ordinances and so as not to interfere with work of other trades.
- E. Preparation for Plastering. Maintain minimum temperature of 40°F. during application of plaster and until it is dry. Supply temporary heat at no extra cost to Owner. In slow drying weather, supply adequate heat and ventila-

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

SECTION 9A

METAL STUDS, LATHING AND PLASTERING

Requirements of Division 1 apply to work of this Section.

9A-01 SCOPE

Provide metal studs, lathing and plastering, including ornamental plaster work as indicated and specified, complete.

9A-02 GENERAL REQUIREMENTS

- A. Acceptance of Work of Others. Examine all parts of work for any conditions which may affect soundness or correctness of lath and plaster work; make all corrections before proceeding with work. Application of any materials under this section shall be construed as acceptance by Contractor of suitability of all materials and substrates to receive work under this section. Contractor shall remove his materials and replace same at no additional cost to Owner to correct such hidden defects.
- B. Deliver all materials in original containers or bundles bearing manufacturers' name and brand; store on platforms above ground. Store aggregates on clean platforms in manner which will exclude dirt and other foreign materials which would adversely affect plaster.
- C. Cooperate with all other trades involved in work in placing, building, and embedding into "Metal Studs, Lathing and Plastering" work, all fixtures, anchors, sleeves, inserts and miscellaneous items of every description, including, providing openings, chases, etc., to extent necessary for proper and secure installation, attachment and passing of their work; all subject to Designer's approval. Before starting work of this section, all piping, conduit, fixtures, etc., which are to be concealed by and/or penetrate plaster must be in place, tested and approved.
- D. Scaffolding: Construct and maintain in conformity with applicable laws and ordinances and so as not to interfere with work of other trades.
- E. Preparation for Plastering. Maintain minimum temperature of 40°F. during application of plaster and until it is dry. Supply temporary heat at no extra cost to Owner. In slow drying weather, supply adequate heat and ventila-

tion. In dry, windy weather, protect plaster against drafts to prevent too rapid drying.

- F. Protection. Protect adjacent surfaces from damage by water or plaster materials. Plaster surfaces, cut out to install work of other trades, shall be neatly patched. Damaged or defective plaster work shall be made good. Building and premises shall be left clean and free of all plaster and other materials coincident to this work.
- G. Standards.
1. Lathing materials shall conform to requirements of USA Standards "Standard Specifications for Interior Lathing and Furring", A42.4-1950, insofar as they apply to this project.
 2. Portland cement plaster materials, mixing and application shall be in strict accordance with ASA "Standard Specifications of Portland Cement Stucco and Portland Cement Plastering" A42.2 and A42.3, insofar as they apply to this project.
 3. If the above standards do not cover this, the current specification of Metal Lath Association's "Specifications for Metal Lathing and Furring" and California Lathing and Plastering Contractor's Association, Inc.'s "Reference Specification for Plastering" shall govern.
- H. Any conflict between Contract Drawings and specifications, manual and/or instructions listed above shall be referred to Designer for interpretation; Designer's decision will be final.
- J. Only experienced and competent lathers and plasterers shall be used in performing work of this section, and completed work shall be first quality in every respect.

9A-03

SAMPLES, TESTS, MATERIALS AND WORKMANSHIP

- A. Per "Supplementary General Conditions" section.
- B. Sample panels, at least 12" square, shall be submitted to Designer of a range of textures for each required type of plaster finish.
- C. Samples and tests shall be taken at site whenever in opinion of Designer such tests are necessary.

METAL FRAMING

A. Metal furring and non-structural stud channels shall be cold rolled steel of widths indicated and shall be as manufactured by Pennmetal, Milcor, Wheeling, U.S.G. or approved equal. Weight per lineal foot shall be not less than following:

1. <u>Furring Channels:</u>	<u>Size:</u>	<u>Hot Rolled:</u>	<u>Cold Rolled:</u>
	3/4"	.40 lbs/ft	.30 lbs/ft
	1-1/2"	.55 lbs/ft	.475 lbs/ft
	2"	1.26 lbs/ft	.59 lbs/ft
2. <u>Studs & Tracks:</u>	6" studs -----		.950 lbs/ft
	4" studs -----		.798 lbs/ft
	3-1/4" studs -----		.673 lbs/ft

B. Metal load-bearing studs shall be an approved type as made by Pennmetal, Stran-Steel or other approved manufacturers and shall be provided where indicated and required by building code. Load bearing studs shall be punched or unpunched channel shapes (unless otherwise indicated) with minimum, 7/8" flange, fabricated from no lighter than 16 gauge steel with minimum yield point of 40,000 p.s.i. conforming to requirements of ASTM A-245.

1. Tracks, shoes and attachments shall be as recommended by stud manufacturer.
2. Shop finish for all studs, channel runners, etc., shall be galvanized, dipped, or heavily painted a rust-resisting type paint after fabrication.
3. Tie wire shall be No. 16 gauge galvanized, double annealed steel wire.

C. Erect all metal framing, including studs, furring, attachment, tracks, bracing, bridging and other accessories per approved stud manufacturer's current written recommendations for various types installations required, unless more stringent requirements are indicated and required by building code.

1. Unless otherwise indicated, frame openings with two channels on each side and bottom, secure thereto and fasten; use stud or channel header to form lintel; form corners and intersections with 3 studs; provide horizontal bridging.
2. Provision shall be made for rigidly bolting all blocking and special braces or framing for the attachment of work of other trades and other equipment or materials indicated to be supported thereby.

Metal Studs, Lathing and Plastering

METAL SUSPENSION SYSTEM FOR PLASTERED CEILINGS AND SOFFITS

- A. Erect in place in locations indicated and of materials specified herein. With exceptions indicated on drawings and/or specified, erect per approved manufacturer's current written recommendations and building code requirements whichever is more stringent for the various type of installations required.
- B. Metal furring and channels shall be cold-rolled of 3/4", 1-1/2" and 2" widths as shown and/or specified for suspended ceilings as manufactured by Pennmetal, Milcor, Wheeling, U.S.G. or approved equal. Shop finish for all channel runners, etc., shall be galvanized, dipped or heavily painted a rust-resisting type paint after fabrication.
- C. Hanger wire shall be galvanized, annealed wire per AISC Manual, No. 16 gauge for tie wire, and No. 8 gauge for hanger wire.
- D. Hanger wire with ends twisted at least three times around itself shall be saddle-tied to 1-1/2" runner channels, spaces 4'-0" o.c. in the direction of the runner channels and not over 3'-0" at right angles to the runner channels. These to be crossed with 3/4" channels 16" saddle tied to runners with two loops, for metal lath and plaster ceilings.
- E. Hanger wires shall support a maximum ceiling area of 16 square feet when using No. 8 gauge wires.
- F. Ceiling runner channels shall be located not over 6" from parallel boundry walls or beams; furring channels 2" from parallel walls and secured with stickers at 4'-0" centers, bent 90 degrees, bolted to walls and saddle-tied to channels.
- G. Additional ceiling framing shall be provided in cooperation with mechanical and electrical trades as necessary to suspend the ceiling adequately where large ventilating ducts are to be installed and to accommodate fixtures in ceiling.
- H. Channel Splices: Runners lapped 12", cross channels 8" (with flanges interlocked), and tied 2" from each end with two loops of 16 gauge wire.

9A-06

METAL LATH: MATERIALS AND EXTENT

- A. Materials used shall meet minimum requirements specified herein. Metal lath is required as base for all plaster.
- B. Metal lath shall be product of approved manufacturers such as U.S. Gypsum; National Gypsum; K-Lath Corporation; Pittsburgh Steel Products or Inland Steel ("Milcor"). Specific manufacturers' products are specified herein to establish types and quality required and not to restrict competition.
- C. Exterior Metal Lath:
 1. For exterior plastered soffits, use K-Lath Corporation's "Super Suction Gun Lath" Type F-FB galvanized welded wire paperbacked lath.
 2. For exterior plastered vertical surfaces, use K-Lath Corporation's "Aqua-K-Lath waterproofed Vapor barrier backing". Type SFA Self-furring lath.
 3. Note: Use "Standard" K-Lath products where furring supports are spaced maximum of 16" o.c. and "Heavy Duty Type" where framing supports are spaced between 16" o.c. and maximum of 24" o.c.
- D. Interior metal lath as base for all interior surfaces to receive Portland cement plaster shall be K-Lath's "Aqua-K-Lath" waterproofed "Vapor Barrier" backing Type SRB (AK) self furring type.
- E. Interior Metal Lath for Gypsum Plaster:
 1. Use 3/8", 3.4 lb. copper bearing steel, painted rib lath where supports are spaced 24" on center and elsewhere as indicated, required by code or job conditions.
 2. Use expanded metal diamond mesh 3.4 lb. copper bearing steel, painted lath in all other locations.

9A-07

METAL LATHING

- A. With exceptions indicated on the drawings and/or specified herein, erect per applicable portions of current edition of "Lathing and Plastering Reference Specifications" as compiled by California Lathing and Plastering Contractors' Association, Inc.; Metal Lath Manufacturers' Association's

"Specifications for Lathing and Furring", approved applicable manufacturer's current written recommendations and building code requirements (whichever is more stringent) for the various types of installations required.

B. Expanded Metal Lath

1. Secure all metal lath to metal supports with No. 18 gauge tie wire at maximum intervals of 6-inches. Ends of ties shall have three full twists, then bent up in plane of lath.
2. Apply with length of sheet at right angles to supports. Apply rib lath with projections against supports.
3. Lap all sheets 1" at ends. If end laps are made between supports, they shall be adequately laced or tied with No. 18 gauge tie wire. Lap sides of diamond mesh lath not less than 1/2"; lap sides of rib lath by nesting outside ribs. Secure side laps to every metal support and wire-tie between supports not to exceed 9" intervals. All metal lath, except 3/8" rib lath shall be started at one stud away from corner and bent into corner and carried on to abutting wall. Butt rib lath into corners and apply cornerites into corners over abutting lath; wire cornerite at 6" intervals along each edge in corner.
NOTE: Wire-tie cornerite along edges only, not in corner. Place all metal lath so that lower sheets overlap upper sheets. Stagger ends of lath in adjacent courses.

C. Lathing for Portland Cement Plaster

1. Use corrosion-resistant attachments.
2. Horizontal and Vertical Surfaces: Attachments may be made by 14 gauge galvanized "hog-rings- (as made by K-Lath Corp.), 18 gauge tire wire, or K-Lath Corp.'s 16 gauge "K-L Clips." All attachments must engage one or more wires in the lath and encircle the flange of the support at no more than 6" on center.

9A-08

MISCELLANEOUS ACCESSORIES

- A. Though not specifically mentioned herein, provide all miscellaneous stops, screeds, beads, grounds, etc., required for proper and workmanlike installation, all per standard trade practices and as job conditions require.

- B. Such items shall, in all cases, be of materials and sizes adequate and suitable for applicable usage.
- C. Securely fasten such items to applicable surface, i.e., lathing, studs, concrete, etc. Fasten by nailing, wiring, stapling, or other approved methods. Set plumb, straight and true. Intersecting corners shall be mitered and set to form perfect joints with no exposed rough edges.
- D. Install level and true, at base and other locations indicated. Supply fittings for in-corners and out-corners to fit base screeds. Screeds for bases (cement, etc.) shall be as indicated.
- E. Provide Penn Metal Co., Inc.'s No. 15 (3/4") galvanized expansion joints in Portland cement plaster walls and soffits at maximum 10' o.c.
- F. No. 66 "Milcor", or equal, and are required.
 - 1. Whenever a plastered (gypsum and cement plasters) wall or ceiling abuts a concrete or masonry wall which is not to be plastered.
 - 2. Elsewhere as required by job conditions per standard trade practices.
- G. Provide grounds, screeds, drips, corner beads, and other accessories indicated, specified herein and necessary for required first-class and workmanlike plaster work. Corner beads for exterior work shall be Stockton Wire Products (Glendale, California), galvanized "Corner-aid". All metal accessories for exterior plaster work shall be galvanized and as made by Stockton Wire Products Company; Milcor or other approved manufacturer's products meeting requirements specified herein and meeting code requirements.

9A-09

METAL ACCESS DOORS

Access doors shall be 24" x 30" Milcor Style K, unless otherwise indicated; provide where indicated on architectural drawings. NOTE: Install access doors which are specified to be furnished under "Electrical", "Plumbing", and "Air Conditioning" Sections for installation in plastered surfaces.

9A-10

TOUCH-UP PAINT ON METAL

Do not install any metal items in work, which are coated with rust. Upon completion of lathing and reinforcement work, any rusted or bare metal and abraded spots in evidence shall be touched-up with an approved rust-inhibitive non-staining type paint.

9A-11

PLASTERING MATERIALS

A. Water: Clean, fresh, drinkable, free from amounts of organic matter that would adversely affect plaster set. Water that has been used for cleaning plastering equipment or tools shall not be used.

B. Sand for Scratch and Brown Coats: Washed, natural sand graded from coarse to fine with the following limits:

<u>Sieve No.</u>	<u>Percentage by Weight</u>
Passing No. 8	- 95
" " 16	75 - 85
" " 30	45 - 55
" " 50	10 - 25
" " 100	0 - 7

C. Sand for Finish Coat: Washed, natural and uniformly graded from that passing No. 30 sieve to that retained on No. 60 sieve. Sand for the Keene's cement finish coat shall pass a No. 30. sieve. Sand shall be washed, kiln-dried silica and similar to "Crystal White" distributed by Crystal Silica Company of Los Angeles, California.

D. Lime Putty Used in Plaster: Standard brand of quicklime conforming to ASIM Designation C-5, except that it shall contain not less than 85% by weight of calcium oxide. It shall be properly slaked and screened through a No. 16 sieve. Slaked lime shall than be properly stored and protected for not less than ten days before using. Unhydrated oxides shall comply with autoclave test as described in Appendix I of "Specifications for Gypsum Plastering" A-42.1-1950 of American Standards Association. Lime putty not to weight less than 83 pounds per cubic foot.

- E. Hydrated lime shall conform to ASTM Designation C-206, Type S, except that "soundness" shall comply with autoclave tests as described in Appendix I of "Specifications for Gypsum Plastering" A42.1-1950 of ASA.
- F. Gypsum Plaster: Standard brand of gypsum neat plaster complying with ASTM Designation C-28.
- G. Gauging Plaster: Conforming to ASTM C-28. A high strength gypsum gauging plaster, similar to U.S. Gypsum "Structo Gauge."
- H. Vermiculite aggregate shall be Zonolite Co.'s or equal.
- J. Portland Cement: ASTM C-150, Type I.
- K. Where plaster is to be applied directly to masonry or concrete apply Larsen Product Corporation's "Plaster-Weld" or "Weld-Crete" per manufacturer's written recommendations before applying plaster.

9A-12

PLASTER MIXING

- A. Measure ingredients accurately and proportion successive batches exactly alike.
- B. Thoroughly mix dry ingredients before adding water.
- C. Except where hand-mixing of small batches is approved, use mechanical mixers of approved type for plaster mixing.
- D. Thoroughly clean mechanical mixers, mixing boxes, and tools after mixing each batch. Mix plaster with proper amount of water until uniform in color and consistency.
- E. Retempering will not be permitted. Discard plaster that has begun to stiffen.

9A-13

PLASTERING: GENERAL

- A. All factory-mixed products shall be applied per manufacturer's directions.

- B. Plaster grounds shall be kept clean and free of plaster. Finish plaster work shall be in true plane with these grounds.
- C. Where plaster is to be applied directly to concrete or masonry, apply Larsen Product Corporation's "Plaster-Weld" or "Weld-Crete" per manufacturer's recommendations before applying plaster.

9A-14

GYPSUM PLASTERING

- A. Thickness of gypsum plasters shall be, except as otherwise shown or required by fire ratings involved as follows:

From back plane of metal lath ...3/4"
From face of other bases1/2"

- B. Base coat mixing proportions shall be 100-pound gypsum hardwall plaster mixed with sand as follows:

Scratch Coat: 200 pounds sand, or
Brown Coat: 300 pounds sand, or
Double Up Over Surfaces: 250 pounds sand.

- C. Two-Base Coat Work: Scratch coat shall be applied with sufficient material and pressure to form full keys and good bond and to cover surfaces. Before setting it shall be cross scratched to receive brown coat. Brown coat shall be applied after scratch coat has set thoroughly (no less than 12 hours). It shall be brought out to grounds, straightened to a true, even surface with rod and darby, and left rough to receive finished coat.

- D. Finish Coats

1. Use gypsum-lime putty trowel finish and mixed in proportions of 1 part gauging plaster (calcined gypsum) to not more than 3 parts of lime putty, by volume. This mix is equivalent to:
2. One 100 lb. bag gypsum gauging plaster to not more than four 50 lb. bags hydrated lime or to not more than 4.5 cu. ft. (or 35 gal.) of lime putty. Finish coat thickness shall be 1/16" to 1/8". It shall be well troweled with water to a smooth finish, free from cat-faces and other blemishes or irregularities.

- E. Curing: Protect each coat from irregular or excessive drying. Where curing cannot be controlled by closing off the room, moisten surface of scratch coat and brown coat with a fine fog spray.
- F. Vermiculite Plaster: Proportion, mix, apply, and cure (with exceptions indicated) per Vermiculite Institute's current "Standard Specifications for Vermiculite Plastering".

9A-15

PORTLAND CEMENT PLASTERING

- A. Coats and Thickness: All cement plaster shall be 3-coat work. For interior work, thickness shall be same as required for gypsum plaster. For exterior work on metal lath, thickness shall be 1-inch.
- B. Mixes shall be as follows:
 - Scratch coat, one part cement and four parts sand.
 - Brown coat, one part cement and five parts sand.
 - Finish coat shall be one part cement and three parts sand. White portland cement and white sand shall be used for white finish coats.
- C. Plasticizing Agents: If necessary to increase workability of mix, hydrated lime or lime putty may be added in smallest amount possible, as determined and approved prior to start of plastering; in any event not more than 10 percent hydrated lime, by weight, nor more than 25 percent in volume, of the cement, lime putty not to exceed 25 percent, by volume, may be added.
- D. Scratch Coat: About 3/8" thick, shall be scratched both ways and moist-cured for at least 48 hours, before brown coat is applied. Lath shall be completely embedded in the mortar.
- E. Brown Coat: About 3/8" thick, shall be applied to dampened surfaces to required thickness, then rodded and floated to true and even surface with no greater than 1/8" variation from 5 foot straightedge, and left rough, ready to receive finish coat. Moist-cure for at least 48 hours. Apply finish coat not sooner than seven days after application of brown coat.

- F. Finish Coat: About 1/8" thick, shall also be applied to dampened surfaces. Texture of finish coats shall match the required approved samples; provide samples as directed by Architect. Moist-cure for at least 7 days by fog spray or other satisfactory method.

9A-16 FIRE RATED (4 Hour) WALL

Four hour fire rated wall shall be as indicated and specified. Crimp and tack-weld pencil rod to studs as indicated. "Blown-in-place" Zonolite concrete shall consist of one sack Portland cement to one sack Zonolite Concrete Aggregate and water. With exceptions indicated and specified all materials used, and proportioning, mixing, applying, curing, and finishing, shall conform to approved manufacturer's current written recommendations for this application.

9A-17 CORRECTION AND REPAIRS

Contractor, under this section, shall make all necessary corrections and/or repairs to the work specified under this section after other mechanics have finished their work. However, damages done by other trades after plastering work is completed shall be corrected by the Contractor under this section but the cost shall be borne by the sub-contractor of the trade causing the damage.

9A-18 ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Metal Studs, Lathing and Plastering Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these Specifications.

- END -

SECTION 9B

TILE WORK: CERAMIC, QUARRY, MARBLE, AND PRECAST TERRAZZO

Requirements of Division 1 apply to work of this Section.

9B-01 SCOPE

Provide all tile work as indicated and specified, complete, including:

- A. All tile listed in "Finish Schedule" (see following Article 9B-02), including ceramic, "synthetic onyx", and precast terrazzo type.
- B. Quarry tile as indicated and specified.
- C. Glass mosaic tile in concrete niches at Carriage Level, and on passenger elevator side of north, south, and east (at air shaft) walls enclosing passenger elevator from Carriage Level to underside of 4th floor.
- D. Marble thresholds.
- E. Elsewhere as indicated.

9B-02 FINISH SCHEDULE AND TYPES OF TILE

- A. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job 1000 - St. Francis Addition Finish Schedule" are herewith made a part of this specification. -- Finish schedule books can be seen in Contractor's jobsite office.~~
- B. Provide all tile, of types, quality, manufacture, colors, and sizes listed in Volume 2 of above noted book and as specified herein. Such tile shall be as listed on "CT" pages and pages identified as MAR-9, MAR-12, MAR-13, MAR-14, MAR-17, and MAR-19.
- C. Location of applicable tile shall be as indicated on Contract Drawings and as noted in Volumes 1 and 2 of above noted books.

9B-03 SAMPLES AND SETTING DRAWINGS

Submit as required by "Supplementary General Conditions" Section. Submit full range of samples in class and price range

to Designer. Provide samples of medleys or patterns as required. Upon selection by Designer, provide 4 samples of each kind of tile selected.

9B-04 REFERENCED STANDARDS AND SPECIFICATIONS

- A. USA Standards, Federal Specifications, ASTM Specifications and other published specifications and standards hereinafter referred to by number or title shall form a part of this specification to extent required by such references. Referenced specification or standard shall include all amendments in effect on date of invitation for bids. In case of conflict between referenced specification or standard and project specification shall govern. Contractor when directed, shall furnish an affidavit from manufacturer, certifying that materials or products delivered to project comply with specified requirements.

9B-05 GENERAL REQUIREMENTS FOR TILE

- A. QUALITY, GRADE AND CERTIFICATE: Tile shall be Standard Grade and comply with requirements of USAS A137.1-1967 with modifications specified herein. Tile shall be of grade specified and all containers grade-sealed in accordance with minimum grade specifications described in USAS A137.1-1967.
1. In addition to grade seal, furnish Designer with Master Grade Certificate stating grade, kind of tile, identification marks for tile packages and name and location of job; certificate shall be signed by manufacturer and issued when shipment of tile is made. Deliver containers to site with seals unbroken.
- B. WALL TILE TRIM SHAPES AND BASES: Trim units and shapes shall be of same type as wall tile and shall comply with section 4.2 of USAS A137.1-1967 or with Type III Classification as defined in Federal Specification SS-T-308b. Include all bases, caps, stops, returns, trimmers, and other shapes indicated or required to produce completely finished installations. Trim shapes shall be of sizes and shapes indicated and of color and finish to match wall tile, unless otherwise indicated.

9B-06 MATERIALS

- A. Cement: Standard Brand Portland Cement conforming to ASTM C-150, Type I.

- B. Hydrated Lime: High calcium, ASTM C-207, Type S, plus added requirement demiting unhydrated exides to 8% maximum.
- C. Sand: Clean, washed, sharp, fine aggregate, free from deleterious substances. Conform to ASTM C-40. Sand for floor setting beds shall be well-graded passing a #16 sieve except for 1/16" mortar beds on smooth surface sand shall pass a #30 screen.
- D. Water shall be clean, potable and free of acids, salts, alkalis and any other ingredients injurious to tile work.
- E. Except as otherwise indicated or noted in aforementioned "Finish Schedule" books, in public and employee toilets grout shall be colored to match ceramic tile on floors and walls. Grout in ceramic floors and walls of typical guestroom bath and suites shall be grout with "Tile Seal" or "Snowite" white non-staining grout. Grout for quarry tile shall be an approved epoxy type, acid, stain, and grease resistant.
- F. Curing Paper shall be non-staining "Seekure" as manufactured by American Sisalkraft Corporation.
- G. Organic Adhesives shall conform to current certification of C5181-52 from adhesive manufacturer.
- H. Quarry tile on Carriage level floor shall be Kraftile Co.'s (Niles, Calif.) 11-1/2" square paving tile of colors as selected by Designer. Other quarry tile shall be Murray's 6"x6"x1/2", "Sahara" with "Starlite Abrasive" finish.
- J. Glass Mosaic Tile in concrete niches and walls at passenger elevators (see Article 9B-01) shall be of types, sizes, colors and patterns as selected by Designer.
- K. Marble thresholds shall be of type and size indicated; colors shall be as selected by Designer.
- L. Other materials as specified herein.

9B-07

GENERAL REQUIREMENTS

- A. Except as otherwise specified herein, all tile work, including setting beds, grouting, curing, cleaning, etc., shall conform to following requirements:
 - 1. All Ceramic Floor Tile installations shall conform to requirements of "USA Standard Specifications for Ceramic Mosaic Tile Installed With Portland Cement Mortar: A108.2-1967.

2. Quarry Tile, Marble Tile, Precast Terrazzo Type Tile, and Similar Tile Installations shall conform to requirements of "USA Standard Specifications for Quarry Tile and Paver Tile Installed with Portland Cement Mortar A108.3-1967.
 3. NOTE: Where waterproofing membrane system occurs, install 2" x 2" mesh 16/16 wire reinforcing mesh in mortar setting beds for floor tile. Waterproofing membranes on floor areas are specified to be provided under Section 7A "Roof Insulation, Roofing and Waterproofing".
 4. Ceramic tile on gypsum board and on counters (tops and vertical surfaces) shall be applied as specified herein.
 5. Glass mosaic tile shall be applied as specified herein.
- B. All tile shall be cut for proper fitting around work in place. Exposed edges of cuts shall be rubbed smooth with an abrasive stone. All tile shall be ground and carefully fitted at intersections against trim finish between fixtures and accessories. Tile shall carefully fit around outlets, pipes, fixtures and fittings so that plates, escutcheons or collars all overlap the cuts.
 - C. Pattern of tile shall be accurately laid out and established working from center of each wall or space to assure equal size tiles on the ends and to avoid making small unnecessary cuts or flat or trim tile.
 - D. Location of all accessories, anchoring devices for equipment, toilet stalls, mirror frames, etc., shall be located and properly marked before tile work begins.
 - E. All walls shall be checked for plumbness and all angles checked for square before tile is installed.
 - F. Floors shall be checked for proper depth of setting bed.
 - G. Starting of tile work implies acceptance of subsurfaces.
 - H. As the work proceeds, check surfaces of tile for flatness of plane with a 10 foot straightedge. Surfaces found to be warped or off a true plane more than 1/8" in 10 feet shall be taken out back to point of departure and replaced at no additional cost to Owner.

J. Mortar:

1. Proportions shall be requirements of referenced USA Standard Specifications and as specified herein.
2. Mixing: Mix mortar ingredients thoroughly before adding water. Carefully work in sufficient water to obtain desired consistency. Avoid use of excess water. Use caution in mixing to get complete wetting and homogeneity. Rework mixes from time to time to maintain proper consistency, but do not add additional ingredients. Discard mortar that has reached its initial set.

K. Application shall conform to referenced USA Standards and as specified herein.

L. Grout shall be as noted in Volume 2 of Finish Schedule and as selected by Architect.

M. Protection and Curing:

1. Keep tiles free of stains.
2. Close to traffic and other work, spaces in which tile is being set. Keep closed until tile is firmly set. Protect from damage until final acceptance by Owner.
3. Use kneeling boards when working or walking on newly tiled floors.
4. Cure tile installations by keeping damp, as necessary during dry weather, at least 3 days during which time keep all traffic off.
5. Cover floor tile with specified paper; lap and seal edges of paper; leave in place at least three days.

9B-05

TILE ON GYPSUM BOARD

A. Tile on gypsum board in Showers, around bathtubs and in other "wet" areas shall be applied as follows:

1. Apply K-Lath Corporation's "Aqua-K-Lath Waterproofed Vapor Barrier Backing" Type SFB self-furring lath on gypsum board - or:

2. Apply 1 layer 15# Tar Saturated Felt and self-furring metal lath, U.S. Gypsum Junior Diamond Mesh or equal.
 3. Secure metal lath in place as recommended by manufacturer for this type application.
 4. Apply 1/2" mortar by "one float coat" method and tile per USAS A108.1-1967 or, if mosaic tile is to be installed per USAS A108.2-1967.
- B. Tile on gypsum board elsewhere shall be applied per USAS A108.4-1968 with water-resistant organic adhesive complying with USAS A136.1-1967 for Typical Type II exposures.
1. Adhesive used shall be as specified herein and shall be certified by the manufacturer to comply with USAS A13.1-1968 performance test and as proper for this type application.
 2. Apply adhesive per manufacturer's current written recommendations where they differ from following:
 - a. Set tile by floating method; tap tile to firmly embed it in adhesive; grout, clean and cure as specified herein.

9B-09

SETTING CERAMIC TILE ON COUNTERS

- A. Counter tops: Apply one layer 15# Tar Saturated Felt (tacked to wood top, lap edges minimum 2") and set tile in 3/4" Portland cement mortar bed with 2" x 2" mesh 16/16 wire reinforcing fabric in mortar bed; all per USAS A108.1-1967.
- B. Vertical surfaces of counters, cabinets: Apply by same method as specified herein for tile on gypsum board in Showers, including waterproof membrane, self-furring lath and 1/2" portland cement mortar.

9B-10

SETTING GLASS MOSAIC TILE

- A. Materials:
 1. Glass Mosaic Tile shall be of highest quality tiles of sizes and colors selected by Designer and mounted on paper sheets, with reasonably uniform joint, of size and patterns selected by Designer. Tile shall

be as perfect as it is possible to manufacture. Colors and shades shall be reasonably uniform. Exposed face of the tile shall be a smooth, even surface uniform in texture without chips.

- a. Size: All tiles shall be cast approximately $\frac{3}{16}$ " uniform thickness.
- b. Colors: All colors used shall match approved samples.
- c. Cement, lime, sand and water shall be as specified herein.

2. Grout and Buttering Mix shall be waterproof grout mix with up to 1 part of sand added to each 2 parts portland cement. Sand shall have no fine under 80 grit and no coarse over 30 grit. Colors shall be as selected by Designer
3. Pure coat shall be pure portland cement mixed with water into a trowelable wet slurry.
4. Mortar setting Bed shall be mixed in proportions of 1 part portland cement, 1 part hydrated lime, 6 parts of clean sharp sand.

B. Preparation of concrete backing surfaces:

1. All concrete surfaces to receive glass mosaic tile shall be heavily sandblasted to remove surface oil and slickened surface caused by forms or troweling.
2. After concrete surfaces are sandblasted they shall receive dash coat mixed in proportions of 1 part portland cement to 1-1/2 parts sharp fine graded sand. Add 1 part Anti-Hydro to five parts water and in turn add this into dry mixed sand and cement and bring to proper consistency. Roughened surfaces shall be cleaned and well saturated with water prior to application of dash coat. Maintain moisture by covering or repeated wetting, for minimum of 3 days, until cured to maximum hardness and bond.
3. Examination of Surfaces to Receive Glass Mosaic Tile:
Representatives of General Contractor and Tile Con-

tractor firms shall test hardness of dash coat with hammer and chisel and agree to suitability before installation is started.

- C. Workmanship: Glass mosaic tile shall be set by journeymen tile setters experienced in setting tile of this type under similar conditions. Experience in setting clay ceramic tiles only will not be deemed qualifications for setting mosaic tiles.
1. At no time shall mortar setting bed be over 1/2" thick nor less than 1/4" thick. Apply plumb scratch coat where necessary to establish this. Plumb scratch shall be mixed in proportions of 1 part waterproof portland cement to 4 parts clean, sharp sand.
 2. Apply rod and float mortar setting bed to uniform plumb and level surface, allowing room for glass mosaic, to bring finished surface to required plane. Thickness of mortar shall be from 1/4" to 1/2" as required, cut through the setting bed horizontally and vertically every 24 inches.
 3. Exposed back of glass mosaic tile shall be given butter coat of the Buttering Mix. Mosaic sheets shall then be placed in position on pure coat freshly combed onto mortar setting bed with notched trowel. All combing shall be done in horizontal direction. Care shall be taken to cover mortar with back buttered sheets before it has become glazed over from exposure to sun or wind. Sheets shall then be tamped firmly into place, true and even with finished surface line or plane.
 4. Interior corners shall be butt. External corners shall have glass mosaic fitted together with close quirk meter.
 5. Grout all joints, after removal of the paper, leaving them completely and uniformly filled. At no time shall sand or any abrasive be used that will damage the natural sheen of the glass mosaic tile.
- D. Expansion joints are required at all internal corners and at 16' o.c., both horizontally and vertically. They shall be uniformly 1/4" wide by depth of tile and mortar setting bed (and plumb coat if required). Establish expansion

joints as follows, or by other approved methods:

1. Set tile to predetermined point and cut mortar back to surface of tile.
 2. Place wood stripping, cut to approved expansion joint width, tight to tile and back to structural substratum.
 3. Float next section of mortar bed and place next wood strip.
 4. Remove wood strips at completion of tile installation.
 5. Place Dow Chemicals "Ethafoam" or Product Research Co.'s PRC-89 Preformed Joint Filler (butyl sponge rod) in expansion joints.
 6. Seal with Product Research Co.'s "PRC Rubber Calk 5000 Sealant". Color shall be as selected by Architect.
 7. Install preformed joint filler per manufacturers current recommendations for this type application.
 8. Apply sealant per requirements of "Caulking" section of this specifications.
- E. All excess grout, glue and scum shall be removed from face of glass mosaic tile leaving finished surface clean. If acid is used, care shall be taken so that it will not damage color of grout, sealant, or other finishes.

9B-11

CLEANING

- A. Thoroughly clean after grouting and pointing has sufficiently set in accordance with tile manufacturer's recommendations.
- B. Remove all trace of cement or dust accumulation and foreign matter. Clean unglazed tile with acid solution consisting of 10% muriatic acid and 90% water, and upon completion, wash down with clean water. Acid shall not be used in cleaning glazed tile. When acid is used, cover exposed hardware and plumbing trim, liable to injury, with vaseline. Following cleaning, remove vaseline and clean and polish metal work.

9B-12

QUARRY TILE SEALER

All quarry tile floors and bases shall be cleaned and sealed with following Hillyard Chemical Co. products or approved equal.

- A. Scrub quarry tile thoroughly with "Super Shine-All"; after quarry tile is dry apply one coat of "Tera-Seal".
- B. Apply per manufacturer's current printed instructions and recommendations.

9B-13

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Tile Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 9C

RESILIENT FLOORING

Requirements of Division 1 apply to work of this Section.

9C-01 SCOPE

Provide resilient flooring and base work as indicated and specified, complete.

9C-02 GENERAL REQUIREMENTS

- A. Verification of Conditions: Verify at the site all conditions affecting the work of this Section. Report any major discrepancies between drawings and field dimensions to the Designer prior to commencing work. Commencing work shall indicate acceptance of conditions and surfaces underlying or adjacent to work of the Section.
- B. Delivery of Materials: Deliver materials in manufacturer's original, sealed containers with labels intact.
- C. Samples: Furnish for approval, prior to commencing work or ordering of finish materials, duplicate samples of each type of material proposed for use, labeled with name of manufacturer, number or proprietary name, and space in which to be used.

9C-03 FINISHED SCHEDULE

- A. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. Copies of these books may be seen in Contractor's jobsite office.~~
- B. Provide all resilient flooring and bases, of types, quality, manufacture, colors, and sizes listed on page RB-1 through RB-9 page and page VT-1 through page VT-5 in Volume 1.
- C. Location of resilient flooring and bases shall be as indicated on Contract Drawings, specified herein, and noted in Volume 1 and Volume 2.

9C-04

MATERIALS

- A. Tile, unless otherwise noted in Volume 2, shall be 12" x 12" x 1/8" thick.
- B. Rubber Base: Coved top-set type and "carpet" base type 4" high, unless otherwise indicated, dimensionally stable, 1/8" thick with preformed corners.
- C. Adhesives, Primers and Fillers: Of type and composition recommended in writing by manufacturer of applicable covering material.
- D. Reducer Strips: Vinyl, matching tile.

9C-05

WORKMANSHIP

- A. General: Resilient floor covering and bases shall be applied in accordance with best practices, by competent and experienced workmen. Coordinate work with that of other trades whose work abuts or is affected by resilient flooring.
- B. Preparatory Operations:
 - 1. All areas to receive resilient covering materials shall be thoroughly inspected by manufacturer's representative and report made to General Contractor of all areas which are unsatisfactory for receiving such materials. No materials shall be applied over unsatisfactory areas until corrections of defects in workmanship or materials of other trades have been made.
 - 2. Prior to laying resilient flooring, floor surfaces shall be tested for dryness, using test and testing procedure in accordance with materials manufacturer's printed directions. If floor surfaces are not dry, installation of flooring materials shall be withheld until receipt of written approval by materials manufacturer's inspector.
 - 3. Clean all undersurfaces and make them suitable for installation of resilient materials. Correct irregularities in floor with leveling compound if they are so correctable. Concrete surfaces after being left smooth and clean shall have cracks, expansion joints, etc., filled with Armstrong Cork Co.'s S-190 crack filler or an approved equal.

4. Barricades or traffic controls shall be provided where necessary, to protect areas during material application. Following application and until final acceptance of work, protect finished floors with adequate covering paper or by closing off.

C. Installation:

1. Install all materials with joints tight, floor true, level and even. Cut to and around all permanent fixtures. Roll coverings with 150-pound roller and eliminate all irregularities, air pockets, etc. Clean off all surplus adhesive materials.
2. Set tile symmetrically about centers of rooms. Cutting of tile by mechanical devices which produce square and true edges.
3. All materials shall be applied in strict conformity with manufacturer's instructions.
4. Install tile with pattern in one direction (long direction of room or as directed by Designer).
5. Bases: Securely cement bases to walls, partitions and casework as indicated or scheduled. Joints shall be tight. Top and bottom edges shall be in firm contact with abutting surfaces. Use of short lengths of base where stock lengths can be used will not be permitted. Neatly miter all inside corners.
6. Install reducer strips where required by job conditions.

9C-06

PROTECTION, CLEANING, AND WAXING

- A. Close all areas of resilient flooring to traffic until adhesive has fully set and protect until final acceptance.
- B. After removal of surplus adhesive, cover all resilient flooring with heavy sisalkraft paper, lapped minimum of 4" with all joints taped. Paper shall remain intact until final cleaning is performed. If paper becomes torn, replace it.
- C. Immediately before occupancy, resilient flooring shall be thoroughly cleaned per tile manufacturer's written recommendations and buffed with commercial weight power buffers,

using steel wool or other approved type pads suitable for use on resilient flooring. Do not scratch or abrade flooring surface. After buffing, clean tile per manufacturer's written recommendations. After cleaning, floor shall be mopped with clean water, then given two applications of an approved non-slip type wax as recommended by tile manufacturer and finished with an electric polishing machine to Designer's satisfaction.

9C-07 EXTRA MATERIAL

One full box of each type, color and pattern of tile used shall be left with Owner at completion of project.

9C-08 ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Resilient Flooring Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

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SECTION 9D

PAINTING

Requirements of Division 1 apply to work of this Section.

9D-01 SCOPE

Perform painting work as indicated and specified, complete.

9D-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. It is the intent of this section that, with exceptions as set forth herein, Contractor shall adequately prepare, prime and finish any and all of the component parts of the building, including (but not limited to) all miscellaneous exposed materials, grilles, etc., which normally require painting and which are left unfinished under other sections of these specifications. Following listing of items of work included in this section is of necessity brief and general and is set forth hereunder as a check list only. Items specifically excluded from work of this section are set forth in following Article 9D-03, entitled, "Work Not Included".
- B. Carefully examine other sections of these specifications to ascertain scope and extent of Paint Work which is required in connection therewith. Special attention is called to requirements that all mechanical and electrical equipment including grilles, louvers, etc., shall be painted under this section (9D). This includes factory finishes on grilles and other items having "factory finishes", which are not acceptable to Architect.
- C. Extent of Interior Painting shall be as specified herein and as indicated in the "Finish Schedule" (on the drawings). Included shall be all other items not specifically mentioned, but which should be painted to be consistent with adjacent surfaces, touch-up of shop priming, field priming and backpriming.
- D. With exceptions as indicated and/or specified herein, all wood, ferrous metal (galvanized and non-galvanized), plaster, exposed to view in the finish work on exterior of building, including on roof, shall be painted.

- E. Contractor is hereby cautioned that should content of this section fail to specifically cover painting and finishing of any item, the omission shall be brought to Designer's attention prior to submitting proposal, and Designer will prescribe respective finish to be applied. Additional compensation will not be allowed Contractor for painting and finishing such items not discovered prior to bidding.

9D-03

WORK NOT INCLUDED IN THIS SECTION

Refer to the following sections, and all other pertinent sections, for items of related work to be furnished and/or installed thereunder:

- A. General: With exceptions specified herein and/or indicated, all surfaces are to be painted, except textured precast concrete, glass, steel window frames, and aluminum on exterior of building; and glass, floor coverings, tile, marble, "manufactured" marble, aluminum, and manufacturers' finishes which are specifically approved by Designer inside building.
- B. Following items are specified in applicable sections to have shop applied prime coat:
1. "Structural Steel" and "Miscellaneous Metals".
 2. "Building Specialties".
 3. "Electrical" and "Mechanical" sections.
- C. Surfaces specifically listed in "Finish Schedule" as not to be painted.

9D-04

FINISH SCHEDULE

- A. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. Copies of these volumes can be seen in Contractor's jobsite office.~~

All painting, enamelling, staining, and special finishes listed therein, indicated on the Contract Drawings, and specified herein shall be provided under this Section (9D).

9D-05 COLORS AND SAMPLES

All colors shall be as indicated by color chips to be provided later by Designer. In multicoat work using color pigmented paints, each coat shall have sufficient variation of color to easily distinguish it from preceding coat. Using specified or other approved materials, prepare in advance 4 - 8" x 12" panels for each finish and color selected by Designer, including and showing all coats thereof; submit for Designer's approval. Contractor to change samples at own expense until approved by Designer. Completed work shall match approved colors and samples. Do no painting on project until samples are approved. Final approved samples to be mixed at paint manufacturer's plant, not on job.

9D-06 PRIMING AND BACKPAINTING

- A. All finish lumber and millwork, including wood doors and cabinet work, shall be carefully primed with applicable primer and thoroughly backpainted as specified hereunder. Backpainting shall be done immediately upon delivery of millwork, to job site.
- B. First coat of paint or other finish shall be applied immediately after woodwork has been fitted and erected, sanded and approved. Shop coats of paint shall be touched-up prior to application of required priming.

9D-07 ACCEPTANCE OF THE WORK OF OTHERS

- A. Contractor shall thoroughly inspect all surfaces to which materials of this section are to be applied to ascertain that they are suitable for application of his materials thereover. Any defects or other unsatisfactory conditions shall be reported and corrected prior to application of coatings thereon.
- B. Application of any materials of this section over respective surfaces shall be construed as acceptance by Contractor of surface's satisfactory condition. Excuses for failures of painting work due to improper subsurfaces will not be accepted.

9D-08 SCAFFOLDING

Finish and maintain all scaffolding and similar temporary work necessary for execution of the work. Scaffolding shall interfere as little as possible with work being performed by other

trades and shall be shifted between coats if necessary, to allow installation of other work, and remove promptly when no longer needed.

9D-09

PROTECTION

- A. Provide temporary heating facilities and dust-stops required for protection. No painting shall be performed unless heating and enclosures are ample to protect work. No painting shall be performed in dusty rooms or in rooms where other work is being performed that might raise dust or cause other disturbances which would cause damage to painted, enameled, stained, surfaces. Sections of building shall be isolated as necessary to prevent dust circulation. Temporary closures shall be provided as necessary at locations where isolation cannot be provided by doors or closed openings.
- B. Protect all finished work during progress of painting and make good any damage done to such work in a satisfactory manner. Properly cover and protect all finished work of other trades and clean such items of all paint splatterings.
- C. Paint materials shall not be stored or mixed on or adjacent to finished floors and walls, unless such surfaces are adequately protected from splatterings. In short, handling and application of materials of this trade shall be at entire risk of Contractor, and he will be held responsible for replacement or suitable repair of any damaged portions of his own work and the work of other trades and without additional remuneration.
- D. Provide adequate barriers, "Fresh Paint" signs or other devices necessary to protect all paint work during its application and until acceptance of the entire job. Damage work shall be repaired or replaced (as directed) at no additional cost to Owner.

9D-10

TEMPERATURE

- A. No exterior painting shall be done when the temperature is, or will be until paint is dry, below 40°F. (50°F. for water-vehicle paint). Paint shall not be applied in rainy, damp, dusty, misty, or excessively windy weather.
- B. All rooms in which painting is to be started shall be heated to a temperature of 68°F, 72 hours before painting starts.

No interior painting shall be done when room temperatures are below 50°F. and no enameling or varnishing shall be done when the temperature is less than 60°F. In general, temperature shall be at least 70°F.

9D-11 WORKMANSHIP

All materials shall be applied by skilled mechanics. Mechanics shall not be assigned to any work requiring special finishing, if they have not had previous experience in that type of work. All workmanship shall be of very best materials evenly spread and smoothly flowed-on without runs, sagging, brush marks, skips, catfaces, or undercoats showing through.

- A. Special Superintendence: Designer intends that finish painting be first-class in every respect, and that best artisans be employed in the work. Repainting and refinishing of any work not up to highest standards of trade will be required at Contractor's expense. If painter spoils any surface by improper work or materials, he shall pay for removing, replacing, and refinishing it.

9D-12 PREPARATION FOR PAINTING

- A. Surfaces shall be clean and perfectly dry when paint is applied. All rooms in which painting is to be started shall be swept clean, dusted and then all surfaces wiped with a damp cloths to remove all dust and dirt.
- B. No interior painting and finishing will be permitted until building has been thoroughly dried out. New plaster, masonry, concrete, etc., shall have aged at least 30 days under good drying conditions prior to painting. Use moisture meter to ascertain moisture content recommended by applicable paint manufacturer.
- C. See Mechanical and Electrical Sections for cleaning and preparatory work specified to be performed thereunder.
- D. If woodwork, metal or any other surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding, puttying operations, notify Designer, in writing, or assume responsibility for and rectify and unsatisfactory finish resulting at no additional cost to Owner.

E. Wood Surfaces:

1. Do necessary puttying of nails, holes, cracks, and other defects, after first coat, with putty of color to match that of finish. Bring putty flush with adjoining surface in neat, workmanlike manner, and sand smooth.
2. Sand smooth interior trim to be finished in paint or enamel; clean surface before proceeding with first coat application. Sand with fine sandpaper between coats to produce an even, smooth finish.

F. Metal Surfaces:

1. Wash metal surfaces with mineral spirits to remove any dirt or grease, before applying materials. Where rust or scale is present, use wire brush, or sandpaper, clean before painting. Clean shop coats of paint that have become marred, touch-up abraded parts with primer.
2. Priming Metal Surfaces: All items of "non-galvanized" structural steel, miscellaneous metal and sheet metal will be shop primed as part of the work of other sections. However, all exterior metal shall receive a complete second prime coat as part of the work of this section. Interior metal work shall receive prime coat touch-up as part of the work of this Section.
3. Galvanized Metal: All exposed galvanized metal shall be etched with Sinclair's No. 12 Galva-Wash before priming and painting.

G. Hardware, Coverplates, Etc.: Hardware, which is not primed for painting, electric switch plates and similar items which are not to be painted, shall be removed, and after applicable surface has been painting, replace in a workmanlike manner. If hardware, service coverplates and screws, etc., are required to be painted, match adjacent surfaces. Replace all coverplates when painting work is completed. All repairs and replacement shall be at the expense of the Paint Contractor.

H. Plaster, Masonry, and Concrete:

1. All surfaces shall be thoroughly dry before any seal-

er or paint is applied thereon. Use moisture meter to ascertain moisture content of plaster.

2. Clean all surfaces of all dirt, laitance, excess mortar, encrustations and foreign matter. Cracks, holes, pits, and other imperfections in plaster surfaces, shall be flush and smooth and entire surfaces chemically treated as required to counteract lime and alkali burns, "hot spots" and other inherent disaffecting properties of plaster.
 3. All stains and all spots where surface is touched-up owing to minor defects, shall be treated to prevent stains coming through paint. Completed finish shall be free from alkali, burns and dull spots and shall be uniform in color and sheen.
- J. Drywall: Surfaces shall be cleaned of dust and grease. Defects in taping and finish of joints shall be reported to Architect and corrected prior to application of paint.

9D-13

STORAGE AND HANDLING OF PAINTS

- A. All paint materials, including paints, varnishes, lacquers, thinners, linseed oil, brushes, cloths and tools shall be received, stored, opened and mixed in rooms or areas as designated.
- B. Good ventilation shall be supplied and preparation of all paint shall be under direct supervision of painting superintendent.
- C. All precautions shall be taken to prevent fire; as required by codes, rules, etc., and as directed. Rags, waste, etc., soiled with paint, shall be removed from the premises at end of each day's work, or stored in metal containers with metal covers.
- D. A "NO SMOKING" sign shall be placed over the door and inside of each paint storage and/or mixing room and maintained there at all times. Open cans of volatile materials shall be kept away from the paint storage area.

9D-14

MATERIALS

- A. Painting trade shall submit a list of all paint products and manufacturer's recommended thinning and spread-rate of materials to be used on this project to Designer for

approval within 30 days after award of General Contract.
Upon receiving approval, brands shall not be changed without written approval of Designer.

- B. With exceptions noted, Sinclair Paint Co's materials are specified herein to establish type and quality. Paints of same types and quality as established herein and as made by Dunn-Edwards, Olympic, Pratt & Lambert, Glidden Co., Watco Products, Pittsburg Plate Glass Industries, Inc., Devco Co., Sherwin-Williams, National Lead Paint Co., or Desco will be acceptable.
- C. All materials used on this project shall be of quality and brands specified. Claims by Contractor as to unsuitability or unavailability of any materials specified or his inability to produce quality of work specified, will not be considered unless presented in writing to Designer prior to application of same, with supporting evidence to sustain the claim.
- D. Brand of prime coats shall be same as succeeding coats throughout the work. Paints of different manufacture shall not be mixed together.
- E. All materials shall be delivered to the job site in original cans and/or packages, completely sealed, and bearing names of manufacturer, numbers and kind of paint contained therein. All paint shall be mixed at the factory with primers, undercoaters and enanels in separate containers; bulk paste shall not be used.

9D-15 THINNING

Paint shall be thinned only as directed by printed instructions of manufacturer of applicable paint. All paint thinners shall be exact type recommended by manufacturer of paint brand used and shall bear same brand name. Pure wood turpentine shall not be mixed with paint thinned with mineral or synthetic spirits. Thinners of any kind shall be used sparingly per written recommendations of approved manufacturer.

9D-16 NUMBER OF COATS

Number of coats specified hereinafter are minimum. Insure acceptable paint finishes of even, uniform color, free from cloudy or mottled appearance in surfaces and evident thickness of coatings. "Spot" or undercoat work necessary to produce such re-

sults. At completion of work all paint work which does not show uniform color and texture will be deemed to have been incorrectly thinned and/or applied and Contractor will be required to apply additional coats at no additional cost to Owner until uniform results are obtained.

9D-17

EXTERIOR PAINTING

A. Prime coat for metal referred to herein is in addition to the shop prime coat provided as part of the work of other sections of these specifications.

B. Gloss Finish: Ferrous Metal Not Galvanized:

First Coat 20 Red Lead Primer
Second Coat: 248 Sash & Trim Primer
Third Coat: 250 Sash & Trim Enamel

C. Gloss Finish: Galvanized Metal:

First Coat . 25 Zinc Dust Primer
Second Coat 248 Sash & Trim Primer
Third & Fourth Coats: 250 Sash & Trim Enamel

D. Concrete and Plaster:

First Coat 16 Stucco Bond Primer
Second Coat 1300 Stuc-O-Life 100% Acrylic

E. Wood:

First Coat 289 Exterior Wood Primer
Second Coat 250 Sash & Trim Enamel

F. Other items and/or materials which are to be painted, but which are not specifically mentioned herein, shall be given applicable coatings as specified herein as directed.

9D-18

INTERIOR PAINTING

Prime coat referred to herein, applies only if prime coat is not furnished as part of the work of other sections. Prime coat touch-up of shop coats shall be provided as part of the work of this Section.

A. Prime Coats for ferrous metals shall be:

15 Chrome Oxide Primer on non-galvanized metal
28 White Prime on galvanized metal

B. Enameled Finishes:

1. On Concrete and Plaster apply:
1st coat: 890 Pigmented Sealer
2nd coat: 975 Sinco Prime Undercoater
2. On Gypsum Board apply:
1st coat: 1770 Pigmented PVA Sealer
2nd coat: 975 Sinco Prime Undercoater
3. On Wood apply:
2 coats: 975 Sinco Prime Undercoater
4. On Aluminum and Galvanized Metal apply:
1 coat: 28 White Primer
5. On non-galvanized ferrous metal apply:
1st coat: 15 Chrome Oxide Primer
2nd coat: 975 Sinco Prime Undercoater
6. Finish coats of enamel for all substrates shall be:
Flat Finish: 2200 Porcelain Eggshell Enamel
Semi-Gloss Finish: 1800 Sinco Satin Enamel
Gloss Finish: 800 Sinco Gloss Enamel

C. Flat Painted Finish: Finish coat for following surfaces shall be 1900 Canyon Colors Alkyd Flat.

1. On Concrete and plaster 1st coat shall be 890 Pigmented Sealer
2. On Gypsum Board 1st coat shall be 1700 PVA Sealer.
3. On Wood 1st coat shall be 975 Sinco Prime Undercoater.
4. On Non-Galvanized Steel 1st coat shall be 15 Chrome Oxide Primer and 2nd coat shall be 975 Sinco Prime Undercoater.
5. On Galvanized Steel and Aluminum 1st coat shall be 28 White Primer.

- D. Where latex flat paint is required apply:
1. On Plaster and Concrete 1st coat shall be 890 Pigmented Sealer and finish coat shall be 1700 Sinwall Vinyl Latex.
 2. On Gypsum Board 1st coat shall be 1770 Pigmented PVA Sealer and 2nd coat of 1700 Sinwall Vinyl Latex.
 3. On Acoustical Tile apply one coat 1700 Sinwall Vinyl Latex.
- E. Where Watco Finishes are required apply at least 2 coats Watco-Dennis Corporation's "Watco Danish Oil Finish", in shade matching approved sample. Prepare substratum, mix and apply Watco finisher per Watco Dennis current printed instructions and recommendations for applicable substratum.
- F. Where Olympic stains are required apply one coat Olympic's Clear Seal-Prime, one coat of Olympic Penetrating Stain, and one coat Olympic Cleartex Interior or Olympic Velva Sheen. Olympic stains and finishes shall be as required to match the approved samples and as recommended by Olympic Stain Co.
- G. Where textured finish is required apply U.S. Gypsum's "Imperial QT Texture Finish per U.S. Gypsum's current written recommendations and instructions for this project. On Drywall spackle scratches and scuffs, apply one full coat U.S.G's "Pro-Kyd Alkyd Flat Wall Paint" and one coat "Imperial QT Texture Finish" mixed at jobsite to match color and texture of the approved sample.
- H. Where varnish finish is required apply one coat 1568 Primer Sealer and 2 coats 450 Bar Top Varnish (for gloss finish) or 2 coats 410 Semi-gloss Varnish or 2 coats 407 Velvet Varnish or 2 coats 406 Flat Varnish as required to match approved sample.
- J. Where epoxy coating is required apply following Desco "Glazetite" coatings:
1. One white coat.
 2. One color coat (color as selected by Architect)

3. Two coats of clear Glazetite.
 4. Prepare surface, mix and apply "Glazetite" coatings per Desco's written recommendations and instructions for this project for applicable substratum.
- K. Metal (Not Chromed Nor Having An Approved "Factory Finish"): Clean and prime as specified hereinbefore for applicable surface (i.e., galvanized or non-galvanized) and coat per adjacent surfaces with specified undercoater and enamel.
- L. Other items and/or materials which are to be painted, but which are not specifically mentioned herein, shall be given applicable coatings as specified herein as directed.
- M. Doors: Finish door tops, bottoms and all edges same as balance of doors after they are fitted as specified under "Carpentry" Section.
- N. Priming coats and finishes on doors and finish carpentry work, which are planed or cut away in fitting, shall be immediately reprimed and refinished.
- O. Grilles, Registers, Diffusers, Anemostats, Etc.: Apply one prime coat, whether factory primed, finished or not and finish with two coats of paint to match adjacent surfaces. Interiors of registers and grilles (duct surfaces exposed to view through register, etc.) shall be given one coat Flat Black Enamel.
- P. Finish exposed ducts, piping, conduit grille work, air diffusers and exhausts and other features not specifically designated, to match adjacent walls and/or ceilings.
- Q. Plumbing Fixtures: Provide unfinished underside of all cast iron plumbing fixtures with finish on underside to match color of adjacent wall finish.
- R. Expansion joints, separation joints, "Milcors", and all similar items in walls and/or ceilings shall be painted with specified coats for applicable material, to match adjacent surfaces.

9D-19

INSPECTION

- A. Manufacturer's representative shall inspect workmanship and materials at the site at least 2 times, or as additionally directed by Designer and shall report finding to Designer.

- B. Each coat must be inspected and approved before another is put on as specified hereinbefore.

9D-20 RIGHT OF REJECTION

No painting to be done under conditions which would jeopardize appearance of work in any way. No work will be accepted which shows laps, stains, flat or glossy spots or imperfections in surface over which paint or other finish is applied. Designer shall have right to reject all work which is unsatisfactory and Contractor shall replace work at his (Contractor's) expense.

9D-21 CLEANING AND REFINISHING

Contractor shall, upon completion of his work, remove all paint or putty from all work furnished under other sections of these specifications, and shall refinish any work done by other contractors that has been damaged by work under this section. He shall remove all paint, varnish or putty from work not to be finished. Should Contractor apply the finished coat of paint before other trades have completed their work, he shall do so at his own risk and be entirely responsible for any damage sustained to the final coat of paint. Any work under this section that has become marred or that has developed imperfections shall be refinished at no extra expense to the Owner. Accumulated surplus materials and rubbish from this work shall be removed from the premises.

9D-22 GUARANTEE

Contractor shall furnish a written guarantee to the effect that all painted surfaces shall under normal usage and conditions, not fade, chip, crack, blister, or spall for a period of 2 years from date of final acceptance of the work by the Owner and that any defects discovered during this period, whether it is due to faulty workmanship or to incorrectly applied materials, shall be promptly and satisfactorily replaced without additional cost to Owner.

9D-23 ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Painting required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

TRAFFIC LINE PAINTING

A. Paint shall be one of following traffic paints:

Bauer Traffic
Safety Zone Paint
Traffic and Zone Paint

Bauer Paint Co.
Benjamin Moore & Co.
A. C. Horne Co.

B. Painting and striping shall include 4" wide stall dividing lines, and all required directional arrows and pavement markings. Lines shall be machine painted.

C. The work shall be performed by experienced mechanics. Painting shall be confined to limits of markings. There shall be no paint spray splash or other unintended stains outside limits of markings. Should such defects occur, Contractor shall repair or replace materials without additional cost to Owner.

- END -

SECTION 9E

FIREPROOFING

Requirements of Division 1 and Appendix apply to work of this Section.

9E-01 SCOPE

Furnish and install direct sprayed-on vermiculite fireproofing on structural steel and metal decking as indicated and specified, complete.

9E-02 MATERIALS

- A. Fireproofing shall be Zonolite Division of W.R. Grace Co.'s. "Mono-Kote" of thicknesses indicated on drawings or as required by building code if requirements are more stringent.
- B. Deliver fireproofing material to job site in original, sealed, packages bearing proper U.L. label. Store in dry place.
- C. Furnish certified laboratory test data that fireproofing material will not erode or lose density from air movement in plenum area when subjected to a high velocity air stream test over surface of material equal to 100 MPH for 87 hours.

9E-03 CERTIFICATES

Deliver to Designer, signed certificates stating that materials and methods conform to the standards set forth herein.

9E-04 SURFACE PREPARATION

Surfaces to be fireproofed and construction adjoining or affecting this work shall be complete before any work is started. Fireproofing Contractor shall examine these surfaces and General Contractor shall be notified in writing of any defects which would be detrimental to any work of this Section. Defects shall be corrected prior to start of fireproofing application. Applications of fireproofing shall be construed to constitute acceptance by Fireproofing Contractor of condition of surface as satisfactory for proper installation of his work.

9E-05 APPLICATION

- A. Fireproofing shall be applied by a firm approved by material manufacturer. Perform fireproofing per manufacturer's published specifications. Deliver 2 copies of manufacturer's specifications to Designer within 30 days after award of contract or before commencing application, whichever is earlier.
- B. Spot checks for thickness of applied material will be made by Designer at times and places selected by him. Where fireproofing thickness is not applied to thickness specified, additional material shall be applied.
- C. Requirements of temperature, weather, and ventilation of Vermiculite Institute Standard Specifications for Vermiculite Plastering shall apply to this work.
- D. After application of fireproofing materials has been approved, clean exposed finish surfaces soiled or damaged by fireproofing work.

9E-06 ALTERATION WORK

- A. Contractor is cautioned to carefully study drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Fireproofing Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 9F

DRYWALL WORK

Requirements of Division 1 apply to work of this Section.

9F-01 SCOPE

Provide all Drywall Work as indicated and specified, complete.

9F-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. Study work of all other crafts whose work abuts, adjoins or is in any manner affected by work of this section. Refer to drawings and specifications and consult with other trades and with them expedite and coordinate materials and labor to avoid omissions and delays.
- B. Provide all gypsum board and metal accessories therefor, for partitions, ceilings, shafts, ceramic tile back-up, marble back-up, and elsewhere as indicated.
- C. Provide all metal studs where gypsum board is to be attached to both faces of applicable partitions; where metal lath and plaster is to be applied to one side of stud, metal studs are specified to be provided under Section 9A.
- D. Taping and filling of joints and metal accessories.
- E. Installation of access doors specified to be furnished under "Electrical", "Plumbing" and "Air Conditioning" sections for installation in gypsum wallboard. (See "Work Not Included" paragraphs). Provide other access doors as specified herein.
- F. Provide gypsum board enclosures for plumbing soil pipe as indicated.

9F-03 WORK NOT INCLUDED IN THIS SECTION

- A. "Lathing and Plastering": Metal studs where plaster is to be applied to one or both sides of applicable wall and other items are specified to be provided therein.
- B. With exceptions as specified herein, furnishing of access doors required in gypsum wallboard surfaces for "Electrical"

"Plumbing and "Air Conditioning" are specified to be provided under applicable sections.

9F-04

GENERAL REQUIREMENTS

- A. Examine all surfaces to receive drywall before applying work and notify Designer of unsatisfactory conditions. Starting work without notification shall be construed as acceptance of surfaces.
- B. Deliver all materials to job in original unopened containers or bundles. Store in place protected from damage and exposure to elements.
- C. Concealed electrical and heating work shall be properly installed, inspected and approved before application of gypsum board.

9F-05

MATERIALS

- A. Materials (trade names, etc.) as specified herein are as made by Blue Diamond Co. and U.S. Gypsum Co. to establish types, quality, etc., and not to restrict competition. Materials meeting requirements specified herein, and so approved as made by Kaiser Gypsum Co., National Gypsum Co., or Johns-Manville, or other approved manufacturers will be acceptable.
- B. Use W/R Water-Repellant, "Firecode C" Type Gypsum Board as backing for ceramic tile and elsewhere as indicated.
- C. Fire-Retardant Gypsum Board shall be U.S.G's "SW Firecode C", 5/8" thick unless otherwise indicated. Use for all vertical surfaces, unless otherwise indicated, and where required by code and elsewhere as indicated.
- D. Use U.S.G's SW Sheetrock, of thickness indicated for ceilings, unless otherwise indicated and required by code.
- E. Coreboard: U.S.G's mill laminated to thickness indicated.
- F. Sound Deadening Board: U.S.G's medium density mineral fiber Sound Deadening Board.
- G. Sound Absorbing Blanket: U.S.G's "Thermafiber Sound Attenuation Blankets ASTM non-combustible Class A rating, of thickness indicated.

- H. Laminating Adhesives shall be of types recommended by manufacturer whose gypsum board is used, for applicable types installation.
- J. Metal Studs shall be U.S.G.'s, of widths and gages specified and indicated. Where wall mounted plumbing fixtures are required, install two 16 gage steel studs at 16" o.c. between "drywall" studs. Use 16 gage wide flange structural studs (Milcor, Penmetal, or equal) in locations where marble is to be applied. Use 18 gage steel studs as back-up for ceramic tile.
- K. Screws shall be #6 sheet metal screws or U.S.G. Drywall Screws Type S, self-tapping, with Bugle heads of lengths recommended by wallboard manufacturer for thickness wallboard used.
- L. Materials for Ceiling Suspension System shall be as specified herein.
- M. Joint Reinforcing Tape and Compound shall be U.S.G. "Perf-A-Tape Joint System" or as recommended by the manufacturer of the wallboard used and as required for all fire rated gypsum wallboard installations.
- N. Metal Access Doors shall be "Milcor Style M", 20" x 24", unless otherwise indicated.
- O. Use U.S.G. #100 "Perf-A-Bead" corner beads at all external corners and U.S.G. "Perf-A-Trim" #300 series galvanized channel with a "Perf-A-Tape" flange attached at exposed edges of drywall.
- P. Resilient clips shall be provided as indicated.
- Q. Provide an approved type 2" thick (unless otherwise indicated) Fiberglas insulation with aluminum foil facing in walls, partitions and elsewhere as indicated.
- R. Provide approved (tye 2" thick (unless otherwise indicated) neoprene covered Fiberglas insulation as indicated.
- S. Provide Mason Industries (3335 East Pico Blvd., Los Angeles, Calif.) double deflective Type HD neoprene hanger in suspended ceilings as indicated.

9F-06 CUTTING

Gypsum wallboard shall be cut by scoring and breaking or by sawing, working from the face side. All cut edges and ends shall be sandpapered, where necessary, in order to obtain neat jointing when erected. Cutouts for pipes, fixtures and other small openings shall be scored in outline before knocking out or shall be cut with a saw. Openings shall not be made by punching. Neatly scribe gypsum wallboard to projecting surfaces.

9F-07 INSTALLATION

- A. With exceptions as indicated on drawings and as specified herein, apply per approved manufacturer's current recommendations for all types installations required.
- B. Install studs, runners, and furring channels per manufacturer's (whose materials are used) current recommendations including framing for doors and other openings. Space studs for walls on which ceramic tile and marble is to be applied maximum of 8" o.c.
- C. For Multi-layer drywall installations, apply base layer vertically with 1" specified screws spaced 12" o.c. in field of board and 8" o.c. staggered at vertical joints. Apply face layer vertically with vertical joints staggered; laminate and hold in place with supplemental fastening until adhesive is dry. Apply other layers of gypsum board, coreboard, and insulation per gypsum board manufacturers written or printed recommendations and instructions or building code requirements, whichever is most stringent.
- D. Use Perf-A-Tape joint system on all face board joints and internal angles; use specified trim in continuous lengths at all external corners and edges.
- E. Ends and edges of wallboard shall occur over framing members. If framing members do not occur at edges and ends, then back blocking shall be provided to receive wallboard. To minimize end joints, use maximum practical lengths. Wallboards shall be brought to full contact but shall not be forced or wedged into place.
- F. End joints shall be staggered and wherever edges and ends abut they shall be flush and neatly fitted.
- G. Wallboard shall be held in firm contact with framing member as fasteners are driven home.

H. Apply sheetrock brand W/R Sealant to all raw edges and nailheads in W/R type gypsum board.

J. Ceiling Suspension System

1. Erect in place in locations indicated and of materials specified herein. With exceptions indicated on drawings or specified, erect per approved manufacturer's current written recommendations for the various type installations required.
2. Metal carrying channels and furring channels shall be of sizes specified and indicated and shall be as made by U.S. Gypsum Co., National Gypsum Co., Penn-metal, or Inland Steel (Milcor) or approved equal. Shop finish for all channels shall be galvanized, dipped or heavily painted with a rust-inhibitive type paint after fabrication. Carrying channels shall be 1-1/2" cold rolled steel; furring channels shall be U.S. Gypsum's DWC Furring Channel or approved equal.
3. Wire shall be galvanized annealed per AISC Manual. No. 16 gauge for tie wire and No. 8 gauge for hanger wire.
4. Hanger wires shall support a maximum of 16 square feet when using No. 8 gauge wire.
5. Attach wire hangers to concrete and channels as indicated on drawings. Hangers to be located so that they are spaced at not over 4'-0" on center intervals along 1-1/2" cold rolled carrying channels.
6. Position "DWC Furring Channels" at right angles to carrying channels and space them not over 24" on center. Securely wire-tie furring members to support members with specified No. 16 gauge tie wire.
7. Splice carrying channels by lapping at least 12" and furring channels by lapping at least 8"; tie splices 2" from each end with minimum of 2 laps of tie wire.
8. Locate a hanger within 6" of main runners. Locate a main runner within 6" of walls to support ends of cross furring.
9. No part of the suspension grillage (main runners or cross furring) shall come into contact with abutting walls or load bearing partitions.

10. Gypsum board ceilings shall have power-drive, self-tapping screws at 12" centers in the field and staggered 8" centers on each board edge. Screws shall not be located less than 3/8" from board edges and shall be staggered along abutting edges.
- K. Finished applications of wallboard shall be leveled to within 1/8" in 10'-0" when measured by using a straight-edge. Wallboard shall be left in a clean condition ready to receive required finish.
- L. Install specified metal access doors in locations indicated and as follows: access doors in typical guest room plumbing piping shafts; access doors in guest room ceilings (including bathrooms) and ceilings in Presidential suites.
- M. Taping Joints:
1. Specified tape is required for all gypsum board with exceptions as specified herein or as indicated, apply per approved manufacturer's current recommendations for these applications.
 2. Butt Joints. Using a suitable tool or machine, a thin uniform layer of embedding type cement, approximately 3" wide, shall be applied over joint to be reinforced. Tape shall then be centered over joint and seated into cement, leaving sufficient adhesive under tape to provide proper bond.
 3. Angles at junction of wall and ceiling and at inside vertical corners shall be similarly reinforced, as for butt joints, but with the reinforcing tape folded to conform with adjoining surfaces and to form a straight, true angle.
 4. Drying Tape. Joints shall be allowed to dry thoroughly, a minimum of 24 hours, between each application of cement.
 5. Filling and Finishing. After embedding cement is dry, cover perforated tape with 2 coats of spackle; spread spackle evenly over and slightly beyond tapered edges of wallboard, at edges. Each coat shall be allowed to dry as required. Second coat of spackle shall be applied smooth and slightly crowned over joint with edges feathered slightly beyond first coat.

6. Screw Heads. All dimples at screw heads shall receive 3 coats of spackle applied as each coat of spackle is applied to joints.
7. Sanding. All cemented and spackled areas shall be sanded as necessary after each application has dried. Final coat of spackle and subsequent sanding shall leave all gypsum wallboard and treated areas uniformly smooth and ready for painting.

9F-08

ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Drywall Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 9G

LATEX DECK COVERING
(Dex-O-Tex)

Requirements of Division 1 apply to work of this Section.

9G-01 SCOPE

Provide all latex deck covering as indicated and specified.

9G-02 GENERAL REQUIREMENTS

- A. Color selection of finish shall be as selected by Designer from among manufacturer's standard colors.
- B. Overall thickness of installation, exclusive of any underlayment required for surface preparation, shall be at least 3/16-inch.
- C. Evidence shall be submitted that waterproof membrane will withstand a water pressure of 50 lbs. p.s.i. for period of 1/2 hour without water transmission or rupture of membrane.
- D. Installation shall consist of a felt divorcing sheet and a flexible, elastic reinforced waterproof membrane composed of synthetic latex elastomer, an integral latex flashing; and a synthetic chloroprene latex mastic traffic surface; all meeting requirements of U.S. Military Spec. MIL-D-3134.
- E. Manufacturer shall be able to provide list of at least 5 installations on which material proposed for use has been in service satisfactorily for at least 5 years.

9G-03 MATERIALS

All latex mastic synthetic rubber materials shall be manufactured by Crossfield Products Corporation and shipped to job in unopened, factory-packaged containers bearing date and name and address of manufacturer.

9G-04 APPLICATION

Dex-O-Tex Weatherwear shall be applied by Contractors approved and trained by Crossfield Products Corp., per Crossfields' application instructions (S-607W) and as follows:

- A. Prepare concrete substrate as necessary to fulfill specified "guarantee" requirements.
- B. Felt Divorcing Sheets shall consist of 15 lb. asbestos felt applied to entire flat area terminating 2" from all vertical surfaces. Material shall be lapped 2" and bonded with rubber adhesive.
- C. Bondcoat and Synthetic Rubber Membrane:
 1. Cover divorcing sheet and entire area (including base and vertical protrusions) to receive DEX-O-TEX Weatherwear with 1/16" trowel coat mixture of stabilized neoprene rubber latex and bondcoat powder, blended in proportions of 1 part paste to 2 parts powder by weight.
 2. When bondcoat coating has dried sufficiently, apply liberal coat of DEX-O-TEX synthetic rubber and while rubber is still wet, lap reinforcing fabric two inches.
 3. After first coat has cured enough to walk on, apply second coat of synthetic rubber covering all pinholes and voids in first coat.
- D. Synthetic Rubber Latex Flashing:
 1. Synthetic rubber membrane shall be installed on all flashing areas (walls, thresholds, vents, railing posts, terminal edges, etc.) and reinforced with 8 oz. burlap.
 2. Brush DEX-O-TEX latex primer up 5" on flashing areas just ahead of burlap strip. Use 8" to 10" burlap strips. Apply burlap (half on flashing area, half on deck surface) and work well into primer.
 3. Cut and fit pieces of burlap for corners, drains, etc.
 4. After drying, brush on more coats until all pinholes have been covered. Roofing drains shall have burlap-primer membrane carried (counter-flashed) into drain bowl.
 5. Surfaces to be covered with reinforced synthetic rubber membrane shall have previously been coated with DEX-O-TEX bondcoat.

D. Chloroprene Latex Mastic Traffic Surface:

1. DEX-O-TEX Neotex (Body Coat) shall be applied in two layers, mixed as follows:

N-38 Paste	1 gal.	(9 lbs.)
Neotex Powder	1 bag	(45 lbs.)

- a. First coat of DEX-O-TEX Neotex (Body Coat) shall be trowel applied to minimum thickness of 1/16" and shall even up all burlap ridges. Cover entire flat area.
- b. After first coat has dried, apply second trowel coat leaving a smooth and even surface texture.
- c. Flashing or base area shall be covered with smooth application of drier formulation of DEX-O-TEX Neotex (Body Coat) or approved synthetic rubber underlayment. (DEX-O-TEX G-26 Underlayment.)

9G-05

GUARANTEE

Guarantee shall be per "Project General Requirements" section, however, guarantee shall be for 2 year period.

- END -

SECTION 9H

MARBLE WORK

Requirements of Division 1 apply to work of this Section.

9H-01 SCOPE

Provide all marble work (as defined herein) as indicated and specified, complete. Principal items of work include:

- A. Finish Schedules, as used herein refer to Finish Schedules noted on Contract Drawings and following:
 1. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. Copies of these books can be seen in Contractor's jobsite office.~~
 2. Provide all marble (as defined herein) of types, quality, manufacture, colors, and sizes listed on pages MAR-1 through MAR-8, MAR-10, MAR-11, MAR-15 MAR-16, and MAR-18 in Volume 2.
 3. Location of marble shall be as indicated on Contract drawings, specified herein, and noted in Volume 1 and Volume 2.
- B. Definition: Marble, as used herein, refers to all marble, onyx, travertine, and man-made "marble", including plastic types listed in Volumes 1 and 2, with exceptions specified herein.
- C. Provide all accessories required for work of this Section. These items include shelf angles, dove-tail slots, ties, anchors, drive-pins, cork and other items required for marble work.

9H-02 WORK NOT INCLUDED IN THIS SECTION

- A. Black anodized aluminum trim to be applied above marble bases (see page MET-6 in Volume 2) is specified to be

furnished under: "Architectural Metal Work" section for installation under Section 9H.

- B. Marble thresholds; "synthetic onyx" as listed on pages MAR-9, MAR-12, MAR-13, MAR-14 and MAR-17; and precast marble floor tile as listed on page MAR-19 (Volume 2) are specified to be provided under "Tile Work" Section 9B.

9H-03 SHOP DRAWINGS

Submit shop drawings, per "Project General Requirements" Section, showing all setting beds, dimensions, connections with other work and anchorage of marble.

9H-04 SAMPLES

Submit per "Project General Requirements" Section, samples of all marble required, to Designer for approval, prior to fabrication of any part of work. Samples shall show the Group Classification, range of color, markings and finish samples in Designer's office and shall match, in Designer's opinion.

9H-05 SHIPPING AND HANDLING

Finished materials shall be carefully loaded and packed for shipment, using precautions against damage in transit. No material which would cause discoloration or staining shall be used for blocking or packing. Upon receipt at site material shall be stacked on timber or platforms at least 4" above ground. Extreme care shall be taken to prevent staining at storage area. Patching of stone will not be permitted except with specific permission of Designer for each instance.

9H-06 MATERIALS

- A. All marble shall match approved samples in Designer's office and be of sizes, types, and quality indicated. All natural marble shall conform to requirements for Group "A" marble as established in Marble Institute of America's "Standard Specifications for Interior Marble".
- B. Portland Cement shall conform to requirements of ASTM C-150. Non-staining Cement shall conform to requirements of ASTM C-91. Molding Plaster (Plaster of Paris) shall conform to requirements of ASTM C-59.

- C. All sand shall be clean, free from organic and other deleterious matter likely to stain finished work and shall be screened as required for desired results.
- D. Portland Cement Shrinkage Reducing Accelerator used with Portland cement to give it quick setting characteristics of Plaster of Paris, shall be non-staining admixture that will not corrode anchors or dowels.
- E. Plasticized Bonding Cement used in place of plaster or cement shall be plasticized synthetic resin base that will not stain through Marble, that is not affected by temperature changes or moisture and that adheres with strong suction to all clean surfaces.
- F. Caulking mastics used for setting and pointing to exclude moisture and to provide a joint that will remain plastic for many years, shall be non-staining. In addition, caulking mastics of oil resin base type shall meet requirements of Federal Specification TT-C-598.
- G. Anchors, dowels or cramps shall be corrosion resistant metals. Special cramps, dowels, and like shall be used where shown on drawings; including approved shop drawings but elsewhere #12 Stubs Gage Half Hard Yellow Brass Wire Anchors shall be used. It shall be responsibility of Marble Contractor to anchor all marble securely. Following are minimum requirements for anchoring standing marble:
 - 1. A minimum of 2 anchors shall be required on all pieces up to 2 square feet in area.
 - 2. A minimum of 4 anchors shall be required for all pieces up to 20 square feet in area.
 - 3. A minimum of 2 additional anchors shall be required for each additional 10 square feet.

9H-07

WORKMANSHIP AND INSTALLATION

- A. Standard Specifications and Instructions: With exceptions as indicated, specified herein or required by Building Code, all Marble Work under this specification section shall meet requirements established in current issue of Marble Institute of America, Inc.'s (M.I.A.) "American Standard Specifications for Interior Marble". NOTE: Any questions pertaining to Marble Work will be decided by Designer by reference to Contract Drawings and Specifications, applicable Building Codes, and this M.I.A. Standards.

- B. Quality: Stone shall be sound and durable, free from quarry sap, dry seams and mineral stains; color and texture to be within range of variations specified and represented by approved samples. Natural variations in color and markings characteristic of material that do not, in opinion of Designer, impair its strength or durability nor mar its appearance, will be admitted. Stone used for polished or hone finish shall be selected at mill so that when set in place a harmonious balance and grouping of color and markings will show on exposed surfaces.
- C. Cutting: Cut stone accurately to shape and dimensions with joints and bonding as shown. Cut exposed faces straight and true with sharp lines and arrises. Beds and joints shall be straight and at right angles to face. Except where otherwise shown, backs shall be sawn or dressed parallel to face of walls.
- D. Job Measurements: Measurements shall be taken at job site.
- E. Setting Marble:
1. Thoroughly clean stone, then sponge with clean water just before setting. When setting in cold weather, clean stone by brushing instead of sponging.
 2. Set each stone plumb, level and true to line and tap to solid bearing. Sawing through mortar joints to correct bearing or to adjust joints will not be permitted. Do not use pinch bar on exposed face of stone.
 3. Every facing stone shall have at least two anchors; one anchor for each 2' or fraction thereof in length and in no case less than two anchors.
 4. Use epoxy bonding cement for narrow marble strips to be secured to wood counters.
 5. Use bonding cement between marble and gypsum board backing.
 6. Marble strips between "rosewood" panels shall be anchored to metal studs with #8 copper wire spaced as required by code; minimum of 4 anchors required for each piece of marble.

7. Provide steel shelf angles as indicated and required to securely and safely install marble.
8. Provide black anodized aluminum trim strips at corners of marble panels in elevator lobbys as indicated. Trim strips shall match required approved samples.
9. Use non-staining type bonding cement for securing counter tops and "splash" pieces.
10. Marble set against stud walls shall be backed by Plaster of Paris spots placed not over 15" apart and shall be securely anchored to structural backing with wire anchors properly wedged into holes cut or drilled into edge of marble. Edges of wall slabs shall be buttered with Plaster of Paris as they are set, to completely fill joints between adjoining slabs; excess of such filling shall immediately be removed and cleaned from face of marble.

9H-08

DANCE FLOOR IN SKY BAR

- A. Provide marble dance floor as indicated and specified, complete in place.
- B. Marble shall be as indicated on drawings.
- C. Elevated floor type pedestals shall be as indicated and as made by Serem Products, Inc., Washington Aluminum Co., Weber Architectural Products Div. of Wotter Kidde & Co., Liskey Aluminum, Inc., Tate Engineering, Inc., or approved equal.
 1. Submit to Designer, for his approval, structural calculations showing that the completed floor installation will safely hold the required loads.
 2. Install per drawings, including approved shop drawings, as required by code, and per approved manufacturer's written instructions and recommendations for this installation.
- D. Install marble per approved shop drawings.

9H-09

CLEANING AND PROTECTION

- A. Upon completion of building, leave stone clean and free from mortar stains or traces of cleaning compounds and with all joints pointed.
- B. Protect all work as required to prevent damage prior to acceptance of the work by the Owner. Replace damaged or defective stone.

- END -

SECTION 9J

ACOUSTICAL WORK

Requirements of Division 1 apply to work of this Section.

9J-01 SCOPE

Provide all acoustical work including suspension systems, as indicated and specified, complete.

9J-02 SHOP DRAWINGS

Submit per "Supplementary General Conditions".

- A. Details of complete suspension systems with calculations and structural data for all supporting members and fastenings, including special supports around ductwork, and other installations connected to ceilings specified herein.
- B. Ceiling layouts showing supporting and trim members, tile patterns and arrangement, light fixtures, grilles, access panels, sprinkler heads, etc., including locations and sizes of openings in acoustic tile ceilings to accommodate work of other trades.
- C. Schedule of all tile, type, size and locations.
- D. Certified test data to meet requirements specified herein.

9J-03 SAMPLES

- A. Submit per "Supplementary General Conditions", minimum 3 for each item, labeled for identification as to part, number and purpose.
- B. Acoustical units, full size, each type including laboratory test data for sound attenuation, NRC, etc., by approved testing laboratory.

9J.04 TREATMENT AGAINST DETERIORATION

All acoustical tile units shall be treated at factory to render them immune from termites, dry rot, fungi, bacteria, etc.

9J-05 ACCEPTANCE OF THE WORK PERFORMED BY OTHERS

Carefully examine all construction work provided by others,

to which work of this section relates, to determine that it is in every case and in every respect, sound, correct, and suitable for suspension system and acoustical tile work. Verify that corrections required are made before proceeding with work. Application of any materials of this section shall be considered as evidence of acceptability of work of others in conjunction with this work, and excused for poor workmanship, failure, etc., because of faulty work of others will not be accepted.

9J-06 PREPARATION

Clean all materials to which tile will be applied; remove all dirt, dust, oil, grease, loose paint, and all other substances which would adversely effect work of this section. Wire brush surfaces if necessary to provide good installation.

9J-07 GENERAL REQUIREMENTS

- A. Nothing herein is to be so construed as calling for other than first-class workmanship and any not so fulfilling this requirement to be removed and replaced with proper material and workmanship.
- B. Use of approved substitutions shall in no way relieve Contractor from responsibility for compliance after installation. It shall be incumbent upon Contractor using approved substitutions to assume any extra cost caused by use of approved substitute materials where affecting other work or trades.
- C. Arrange and install in a finished manner all acoustical work and integrated light fixture installation when and as required to conceal and/or connect with work of others. Ascertain that all required inspections have been made.
- D. Consult Architectural, Structural, Electrical and Mechanical Drawings and check them with acoustical work. Acoustical Contractor to be responsible for coordination of his work with that of other trades. Consult with superintendents of other trades and General Contractor's superintendent to insure complete coordination of all work.
- E. Delivery and Storage:
 1. Deliver materials to job in manufacturer's unopened, original containers with manufacturer's brand and name clearly marked thereon.

2. Handle and store materials carefully. Store materials in original containers at not less than 70°F. for at least 24 hours before installation.
- F. Qualifications: Acoustical Contractor shall present written evidence that he is experienced in satisfactory installation of products specified, including written approval from manufacturers of products he proposes to use and that he is acceptable and authorized representative for his products in this area.
- G. Before starting work of this section, all piping, conduit, fixtures, fire sprinklers, which are to be concealed by and/or penetrate such work, must be in place, inspected, tested and approved. Removal and replacement of installed acoustical tile work, as may be required to permit inspection and testing, shall be at Contractor's expense.
- H. Do all cutting necessary for the proper installation of this work and arrange for repair of any damage done by this Contractor or his workmen to work of other subcontractors.
- J. All exterior doors shall be closed in and all windows glazed; all plastering and wet work shall be completely dry; and building interior dry before any acoustical work is started.
- K. Maintain temperature of 70°F. for minimum of 3 days prior to installation of acoustical tile, during installations, and for minimum period of 3 days after installation, and normal relative humidity of 55 percent. Maintain minimum of 60° thereafter. Heating system proper temperature conditions before, during and after acoustical work is in progress.
- L. Protect adjacent work of other trades from damage and soiling during execution of work of this section. Handling of materials of this trade shall be at risk of Contractor. He will be held responsible for replacement of any damaged portions of other trades, all to satisfaction of Designer without additional remuneration.
- M. Verify all dimensions shown on drawings by taking field measurements; proper fit, alignment and attachment to adjoining work is required.

- N. Leave 1 carton of new undamaged tile of each type and pattern used, for Owner's future use.
- O. Where required, provide additional wire drops to tee bars to support light fixtures, grilles or partitions.
- P. Scaffolding and guardrails, shall be constructed and maintained in conformity with applicable laws and ordinances, and so as not to interfere with work of other trades.
- Q. Acoustical Tile Units: Install in true and even plane; in straight line courses laid out symmetrically from center lines of rooms, so that closures at opposite walls will be equal in width. Pattern shall be square with room and in perfect alignment. Where walls are not at right angles to each other, direction of tile rows, (and joint lines) shall be clearly indicated on shop drawings for Designer's approval. Scribe and butt units to supporting members at adjacent surfaces (at walls, fixtures, grilles, and other work abutting or passing through ceiling surfaces) seal joints in acoustical tile around penetrations with materials recommended by tile manufacturer. Install tile in one direction in most narrow dimension of applicable room.
- R. Permits, Codes, Rules and Safety Orders: Secure all necessary permits and pay all costs or fees for prosecution of the work. Where above rules call for any work over and above that indicated or specified, provide same.
 - 1. Suspension systems shall be as specified, indicated on drawings, and required by building code; in case of conflict consult Designer whose decisions shall be final.

9J-08

PHYSICAL AND ACOUSTICAL CHARACTERISTICS

Characteristics of each type acoustical unit herein specified shall be established by tests made by approved acoustical laboratories, in accordance with approved test procedures. Within 4 weeks of date of award of contract, submit 3 copies of certified test reports issued by Testing Laboratory, establishing tile identity, stating test procedure by reference to standard and results of test.

- A. When materials to be used are listed in Bulletin XXV-111-1968, "Sound Coefficients of Acoustical Materials", issued by Acoustical Materials Association, and such listing

verifies compliance with specification requirements, submission of certified test reports as specified above, will not be required.

9J-09

FINISH SCHEDULE

- A. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job No. 1000 - St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. These books may be seen in Contractor's jobsite office.~~
- B. Provide all acoustical work of types, quality, manufacture, colors, and sizes listed on "ACT" pages in Volume 1.
- C. Location of acoustical tile systems shall be as indicated on Contract drawings, specified herein, and noted in Volume 1 and Volume 2.

9J-10

CONCEALED SUSPENSION SYSTEM

- A. Concealed Suspension System shall be Armstrong Cork Company's 100% Accessible Tile System Type ATS and shall be manufactured from .025 gage cold rolled electro-galvannealed steel and shall consist of the following parts and pieces:
1. Main members shall be 1-1/2" high with predetermined hanging tabs at 12" o.c., hanger tabs approximately 3/4" high.
 2. Struts for spacing Accessible Tile System shall be manufactured from .025" cold rolled galvanized steel and shall be of an L type with predetermined notches in the struts to engage on the top of the Accessible Tile System's main member and shall be securely locked into place.
 3. Cross tees shall be manufactured with tabs at the ends of each 24" cross tee which snaps into Accessible Tile Main Member. Cross tee shall be placed in the kerfs of the 12" x 12" tile units at 12" o.c.

4. Each cross tee shall have a predetermined cut out notch to enable a hook knife through the butt edge of the acoustical unit to allow the acoustical material to demount downward. All other suspension systems of an upward type demountability will not be accepted.
5. The overall depth of the complete assembly including hanger tabs for the Accessible Tile System, tee splines and acoustical tile shall not exceed 3".

B. Installation:

1. Main members shall be spaced 24" o.c. and suspended from #12 gage hanger wires spaced 4' o.c. along the main member.
2. Stabilizer members shall be spaced 4' o.c. perpendicular to main members.
3. System shall be direct hung.
4. Complete system shall be leveled to 1/8" in 10'.
5. Acoustical tile shall be installed within suspension system using concealed tee clip splines 12' o.c. running perpendicular to main members.
6. Complete ceiling shall be 100% accessible downwardly.
7. Metal edge molding shall be installed around all wall perimeters and columns painted to match acoustical tile units and securely attached to wall surfaces 2' o.c.
8. Spring clips shall be inserted behind all cut acoustical tile units.
9. Metal edge molding shall be L type with 1" face and 3/4" vertical return, unless otherwise indicated or noted in "Finish Schedule" including Volumes 1 and 2.

9J-11

EXPOSED SUSPENSION SYSTEM

Where exposed T-bar type system (non-fire-rated type) is required it shall be Lok Products Co.'s "Drive Lok" exposed

aluminum grid systems or approved equal meeting minimum requirements as indicated and as follows:

- A. Hanger wires shall be #12 gauge galvanized annealed steel.
- B. Grid members shall be extrusions made of aluminum alloy 6063-T5 and shall have a minimum working stress of 900 psi, flanges and stems shall be a minimum of 0.0625" thick.
- C. Main runners shall be T 15R members with a moment of inertia of 0.0355 in 4.
- D. Cross runners shall be T 11V members with a moment of inertia of 0.0135 in 4.
- E. Perimeter wall angle shall be WA-100R designed to provide an integral mechanical interlock for connection with abutting tee members. This member shall have a raised shoulder to allow ceiling board to lay flat and level with abutting tee members.
- F. At splices and intersections, tees shall be joined together by an independent interlocking malleable aluminum clip (CL-52) which can be removed from the tees to facilitate relocation or replacement. All intersections and connections including wall angles shall be capable of withstanding at least 100 lbs. tension or compression.
- G. Finish on exposed surfaces shall be baked enamel white "Mat-Text" finish.

9J-12

ADHESIVELY APPLIED TILE

- A. Adhesive shall be water-resistant and alkali-proof adhesive cement best suited to the acoustic tile used and one recommended by the manufacturer of the tile and manufactured specially for acoustical mounting.
 - 1. Adhesive material shall be of such quality that it will remain semi-plastic when permanently set, and shall not dissolve nor break down when permanently set test pats are placed in cold salt water solution for 8 hours.
- B. Application: Acoustical tile shall be adhesively applied directly to the primed surface of the wallboard with 4

pats of adhesive, 2-1/2" minimum in diameter, at each corner of tile. Butt units tightly.

9J-13 DEFECTS

Such defects as breathing, loosening, falling, buckling, excessive shrinkage, warping, cracking, settling, chipping, spotting, discoloration loss of acoustical properties and irregular and non-uniform joints, will not be accepted.

9J-14 CLEANING

After acoustical units are installed, clean exposed surfaces. Touching up of factory-applied finish shall be done as necessary to place all surfaces in an acceptable condition.

9J-15 GUARANTEE

Material and labor in this section shall be guaranteed against defects in workmanship or materials for 2 years after final acceptance of building by Owner.

9J-16 ALTERATION WORK

- A. Contractor is herewith cautioned to carefully study the drawings and these specifications in regards to Alteration Work required, as he will be held responsible for the satisfactory performance of all Acoustical Work required therefor.
- B. Attention is called to the drawings and to Section 1E of these specifications.

- END -

SECTION 9K

WALL COVERINGS

Requirements of Division 1 apply to work of this Section.

9K-01 SCOPE

Apply wall coverings (as defined herein) supplied by Owner and furnish and apply wall coverings as required by drawings and this specification section. Principal items of work include:

A. Finish Schedules, as used herein, refer to Finish Schedule noted on Contract Drawings and following:

1. ~~Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotel) and titled "Job No. 1000 St. Francis Addition Finish Schedule" are made a part of this specification and are hereinafter referred to as Volume 1 and Volume 2. Copies of these books can be seen in Contractor's jobsite office.~~
2. Install and furnish and install wall coverings (as defined herein) of types, quality, manufacture colors, and sizes listed on "WCV" pages and pages MET-3 and MET-4 in Volume 2. This includes wall coverings on walls, counters, cabinets, "Shoji" screens, ceilings, doors, movable partitions, and elsewhere as indicated and specified.
3. Location of wallcoverings shall be as indicated on Contract drawings, specified herein, and noted in Volume 1 and Volume 2.

B. Definition: The word "Wallcoverings" as used herein refers to vinyl, paper, metal foil types, and all similar types material required by drawings, this specification, and Volumes 1 and 2.

C. Inspection and preparation of all surfaces to which wall coverings are to be applied.

D. Application of wall coverings supplied by Owner.

- E. Furnishing and applying wall coverings as indicated and specified.
- F. Installing all metal trim required for wall covering applications, including trim specified to be provided under Section 9K, under other specification sections, and by Owner.

9K-02 WORK NOT INCLUDED IN THIS SECTION

- A. Metal trim as listed on page MET-6 of Volume 2 is specified to be furnished under "Architectural Metal Work" section for installation under Section 9K.
- B. Furnishing materials listed in Volumes 1 or 2 as being furnished by Owner.
- C. Furnishing and installing materials listed in Volumes 1 or 2 as being furnished and installed by Owner.
- D. Plastic laminate work.
- E. Movable partitions, without required wall covering.

9K-03 MATERIALS

- A. Wallcoverings shall be as listed in Volumes 1 and 2 or, if not listed, as selected by Designer. Wallcoverings shall be U.L. and City of San Francisco approved for applicable required flame spread ratings.
- B. Adhesives: Shall be recommended by wall covering manufacturer to fulfill required guarantee.
- C. Metal Border Trim: In locations not covered by Volumes 1 or 2 "Trimege" aluminum trim, is (available through A. L. Greenbaum Co., Los Angeles); required at all exposed edges.
- D. Deliver materials to job in original unopened containers bearing manufacturer's name and product designation.
- E. Provide miscellaneous materials as required by manufacturer's installation instructions.
- F. Provide approved type "blank stock" wall covering in locations required by Volumes 1 and 2.

9K-04 SAMPLES

Submit samples, approximately 24" x 24" of each type and color of fabric, to Designer for approval prior to start of work, per "Supplementary General Conditions" section. Materials delivered to job for installation shall match approved samples.

9K-05 PREPARATION

- A. Inspection: Examine surfaces to receive covering and report in writing to Designer any surfaces not in proper condition to receive covering. Do not begin application until defects are corrected. Starting work constitutes acceptance of wall surfaces as pertains to guarantee requirements.
- B. Tests for Dryness: Test concrete and plaster surfaces which are to receive wall covering. Perform separate test on surfaces representing each day's wall covering application. Continue drying and retest wherever test results are unsatisfactory.
1. Method. Apply 24 inch high by roll-width test mat of wall covering with approved primer and adhesive, bottom edge 18 inches above floor. Immediately seal edges with industrial tape and leave undisturbed for 72 hours.
 2. Test Results: At end of test period, if adhesive is dry and mat cannot be readily pulled from surface, wall is considered sufficiently dry for installation.
- C. Scratches, Gouges and High Spots: Fill and/or sand off to produce a smooth true surface. In event surface imperfections show through applied fabric, material shall be removed, surfaces properly repaired, and recovered with new material.
- D. Priming: Prime all surfaces in accordance with covering manufacturers' recommendations prior to installation of covering.

9K-06 WORKMANSHIP

Workmanship shall be consistent with best practice of trade. Only mechanics capable of performing this type of work shall be employed. Inferior work such as mismatched or fuzzy seams,

air blisters or material not fully bonded to backing shall be removed and replaced with new material as directed.

9K-07

APPLICATION

- A. Applicator: Approved by wall covering manufacturer, using trained and experienced mechanics.
- B. Before cutting, examine pattern and color and determine that they match approved samples. Examine patterned material for repeat in design. Where repeat marks are provided, be sure these marks line up. Trim both selvages where necessary to assure pattern uniformity.
- C. After first two strips have been installed, obtain Designer's approval of color and pattern match and general workmanship. If satisfactory and approved by Designer proceed with work. If not satisfactory, comply with Designer's instructions.
- D. Trim material with straightedge and install with butted seams.
- E. Install each sheet on wall in same sequence as cut from roll. Apply material in full widths, except where required otherwise to fit job conditions. Install material full height in one piece. Horizontal joints not permitted.
- F. Vertical Joints: Keep at least 3" from outside corners.
- G. Apply adhesive in strict conformance with manufacturer's instructions and install wall covering vertically with no horizontal joints. Roll for uniform adhesion, using sufficient lay and excess material to prevent opening of seams by shrinkage, and re-roll. Immediately remove any adhesive from face of material with cleaner. Leave work free of blistered areas, dirt, stains, or other defects. Apply filled canvas generally where old and new surfaces abut to allow uniform paint finish. Wash all existing surfaces to receive wall covering thoroughly with detergent to remove all traces of oil, grease and dirt that may prevent proper adhesion of material.
- H. Aluminum Border Trim: Spackle wall surface carefully to assure a perfect flat fit of trim edge. Apply with contact cement true and plumb, with tightly fitting mitered corners.

- J. Protection: Cover and protect material and finished work until completion of building, or until ordered to remove protection. Replace any damaged or defective work.

9K-08 EXCESS MATERIAL FOR MAINTENANCE AND REPAIR

Upon completion, deliver to Owner at job site, excess material of each type, pattern and color, equal to 2% (minimum of 5 sq. yds.) of material of each type, pattern and color installed in the building. Properly pack and label material.

9K-09 GUARANTEE

- A. Required: Submit written guarantee in approved form in compliance with requirements of "Project General Requirements" section, guaranteeing work of this section against defective materials and workmanship for period of 2 years after date of final acceptance of project by Owner, and agreeing to satisfactorily repair or replace at Contractor's expense, as approved by Owner, all defective materials which develop within guarantee period.
- B. Should replacement of material be required in order to effect satisfactory repair, new material shall provide perfect color match with original material. Should slight mismatch of color occur, existing material shall be removed back to adjacent corners or door frames and entire wall panel be recovered. In such event color mismatch shall not be obvious after completion.
- C. Excess material specified under Article 9K-08 will not be available for repair or replacement under guarantee.

- END -

SECTION 10A

MAIL CHUTE

Requirements of Division 1 apply to work of this Section.

10A-01 SCOPE

Provide mail chute and collection box, complete, as indicated, and specified.

10A-02 MAIL CHUTE

- A. Manufacture: Mail chutes shall be manufactured by Cutler Mail Chute Co. or Capitol Mail Chute Corp. Products of Cutler Mail Chute Co. are specified herein as the standard of quality and design to be furnished.
- B. Mail chute shall be Cutler "Moderne" Model, entirely recessed, mounted as indicated on drawings including approved shop drawings. Collection (primary) box shall be Cutler No. 5628.
- C. Face, face trim, accessories and fittings on front of chute and collection box shall be bronze at Carriage Level and Alcoa's Duranodic 312E Medium Bronze finish (Aluminum Association's AA-C22-A42 finish) on all other floors.
- D. Chute shall extend from top of collection box at Service Level to ceiling above floor at 30th floor level.
- E. Submit shop drawings and samples per requirements of "Supplementary General Conditions" section.
- F. The continuous vertical sides and back of the chute to be extruded aluminum .105" thick. Mail chute to have removable glass panels and floor connections, with bases, lock bands and ceiling collars in heavy plate metal, at least 3/16" thick, mailing pocket, with cigarette ejectors, lock and penalty card frame in each story.
- G. Glass shall be Libby-Owens-Ford "Parallel-O-Bronze" plate glass.

- H. Workmanship shall be only by mechanics skilled in this type of work, equipped with proper tools to install materials free from damage to structure or finish.
- J. All work, materials, fabrication, and installation, shall conform with the rules and regulations of the Post Office Department and Postmaster of City of San Francisco, governing construction, installation, guarantee and bonds.
- K. Furnish Surety Bond in amount of \$3,000.00 guaranteeing the faithful execution of this portion of the work in full compliance with Order No. 3283 of the Postmaster General.

- END -

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SECTION 10B

MOVABLE PARTITIONS

Requirements of Division 1 apply to work of this Section.

10B-01 SCOPE

Provide movable partitions as indicated and specified, complete and satisfactorily operable in place.

10B-02 WORK NOT INCLUDED IN THIS SECTION

- A. Structural members designed to accept the loading imposed by the system.
- B. Acoustic barriers to prevent flanking transmission of sound.
- C. 115 volt AC electrical power supply for electrically operated closure jambs as shown on drawings (if required).
- D. Decorative treatment for wall system.

10B-03 MOVABLE PARTITIONS

Manufacture: "Trackwall" by Industrial Acoustics Company, Inc., Southern Boulevard, Bronx, New York 10454, distributed by C.E. Pickup Company, Whittier, California 90608, or equal as approved by Architect. No modifications of building design will be made to accommodate partition substitutions.

- A. Overhead track: Not less than .229 inches thick steel plate formed as shown on drawings. Secure to structure by 7/16" diameter bolts in accordance with manufacturer's recommendation.
- B. Support each panel from track on 2 ball bearing trolley assemblies having universal movement, and turning on self-aligning spherical bearing without radius turns or switching mechanisms.
- C. Panels: Surfaces to be 14 ga. steel welded to both sides of a 14 ga. steel frame. 4" minimum thickness filled with sound retarding acoustical fill. Average weight not less than 11 lbs. per sq. ft. Entire panel to be incombustible, moisture resistant and dimensionally stable.

D. Seals: Floor, head and vertical seals to be activated by single mechanism. Seals as follows:

1. Floor seals: Full width with durometer rating compatible with floor surfaces.
2. Seals not to contact floor or track during movement of panels.
3. No floor guide or floor attachments permitted.
4. Vertical Seals: All metal tongue and groove acoustical labyrinth 1-5/8" deep. Groove to have 25% free area, made from 22 ga. stock. Tongue to be 16 ga. solid steel. No rubber or resilient gasketing materials to be used.
5. Seal Materials: Resistant to fatigue and cleaning compounds. Not to mar floor or ceiling finishes.

E. Fixed and Retractable Jambs: Embedded fixed and operable closure jambs to form acoustical labyrinth when wall is in place.

F. Acoustical Performance: At least 10 days prior to bidding, submit independent laboratory tests and field tests conducted by an accredited acoustical consultant, showing acoustical performance not less than the values below:

LABORATORY TEST

Frequency cps	Transmission Loss, db	Frequency cps	Transmission Loss, db
125	38	1000	51
175	35	1400	49
250	40	2000	48
350	42	2800	48
500	46	4000	49
700	47	SIC	48

FIELD TEST

Center Frequency cps, Half- Octave Band	Noise Reduction db	Center Frequency cps, Half- Octave Band	Noise Reduction db
44	17	500	43
63	17	700	46
80	18	1000	48
125	24	1400	49
175	28	2000	52
250	32	2800	52
350	37	4000	54

Tests: Laboratory tests to be performed in accordance with ASTM E90-61 on full scale operative wall by an independent laboratory meeting approval of Designer. Field tests with broad band noise signal sources, and instrumentation and techniques which meet USAS standards.

- G. Decorative treatment: System shall be furnished in condition to receive decorative treatment shown on room finish schedule.
- H. Installation: Install in neat, workmanlike manner by supplier.
- J. Guarantee: System to be guaranteed against defective workmanship and materials for a period of one year per requirements of "Project".

- END -

SECTION 10C

BUILDING SPECIALTIES

Requirements of Division 1 apply to work of this Section.

10C-01 SCOPE

Provide all Building Specialties work as indicated and specified complete.

10C-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. Metal toilet partitions. .
- B. Toilet accessories.
- C. Window washing equipment.
- D. Manlift
- E. Rubber dock bumpers
- F. Laundry chute
- G. Trash Chute
- H. Aluminum louvers with screens
- J. Portable stage
- K. Aluminum seismic joint covers
- L. Canvas awnings
- M. Liquid filled parking bumper guards
- N. Projection Screens
- O. Tackboards in Display Units.
- P. Roof hatches.
- Q. Sliding shower Doors
- R. Trash compactor.
- S. Drapery track at proscenium in Function Room.
- T. Sauna Bath

10C-03 SHOP DRAWINGS AND SAMPLES

Submit as required by "Supplementary General Conditions" Section.

10C-04 TOILET PARTITIONS

- A. Manufacturer: Sanymetal Co. Inc.'s Products "Century" ceiling hung type or approved equal as made by Fiat Products, Mills Metal Compartment Co., or approved equal.
- B. Stalls and Doors: 18 gauge vitreous porcelain sheet steel face sheet, formed to provide 1" thick panels over cellular core, excepting doors which shall be made of 22 gauge steel face sheets. Pilasters to be 1-1/4" thick formed of 18 gauge vitreous porcelain sheet steel face sheets with cellular core.
- C. Manufacturer's Standard Items, including chrome plate pivots, door handles, strikes (rubber cushioned), latches and coat hooks.
- D. Finish: Vitreous porcelain enamel finish conforming to requirements of Porcelain Enamel Institute Specifications.
- E. Color as selected by Designer in accordance with "Finish Schedule" Volumes 1 and 2.
- F. Installation: Assemble parts accurately. Set level and plumb in accordance with manufacturer's directions, Designer's drawings and approved shop drawings. All scratches and defects to be repaired to satisfaction of Designer or parts replaced.

10C-05 TOILET ACCESSORIES

- A. Install Owner furnished toilet accessories as indicated and specified in Volumes Numbered 1 and 2 of books compiled and printed by Western Service and Supply Company (Design and Supply Division of Western International Hotels) and titled "Job 1000 - St. Francis Addition Finish Schedule". These books are herewith made a part of this specification and may be seen in Contractor's jobsite office. See pages numbered "PA".
- B. Furnish and install toilet accessories as noted on page PA-30 of Volume 1 of "Finish Schedule" and as indicated on drawings.

- C. Tradenames noted on drawings are so noted to establish types, materials and quality. Accessories as made by Bobrick Dispensers Inc., Accessory Specialties Inc., Architectural Metalcraft Industries, or Watrous Inc., will be acceptable subject to Designer's prior approval.

10C-06

WINDOW WASHING EQUIPMENT

Provide window washing equipment as indicated and specified; complete and operable in all respects. System consists of an electric powered basket with wire rope to be attached to suspended trolley device on overhanging ledge of building. Powered basket shall be suitable for up to 75 feet vertical operation, and horizontal operation to limit of suspended trolley track. System as indicated and specified is as made by Albina Engine and Machine Works, Portland, Oregon; and is so specified to establish type and quality required. System shall consist of the following major items:

- A. BASKET POWER UNIT: One Albina Climber with level wind shall be secured to basket with controls mounted on power unit frame.
1. Albina Climber shall have 1 H.P., single phase, 208 volt, weatherproof electric motor with solenoid brake, to energize braking mechanism when power is off. Motor controls shall be weatherproof lever type (Non-locking).
 2. Climber power unit shall include mechanical overload mechanism, factory pre-set to prevent overloading of basket. Should basket become overloaded, switch shall automatically prevent basket from proceeding upward, but shall permit lowering of basket.
 3. Climber power unit shall be mounted in tubular steel frame with suitable base for attachment of basket.
- B. HOIST GEAR REDUCER shall be double worm, semi-self-locking, 20:1 to 1 reduction, for average lift speed of 18' per minute.
- C. HOIST DRUM: Cable drum assembly shall include patented Lebus designed grooves for 5/16" diameter wire rope. A totally enclosed self-energizing centrifugal automatic safety brake shall be part of drum assembly and shall engage should rate of descent exceed normal rate.
- D. Hoisting cable shall be 5/16" diameter, extra flexible, 7 x 9 galvanized Air Cord or equal with minimum breaking strength of 9,800 lbs.

1. A galvanized wire rope socket shall be attached to wire rope by means of zinc pouring method. An X-ray shall be taken of each poured socket and record kept for same.
- E. Basket shall be constructed of structural steel or aluminum alloy, with suitable decking for workman to stand. Basket shall be approximately 3' x 5' wide.
1. White, polyurethane covered rollers shall be mounted on face of basket, to roll against and protect face of building in both vertical and horizontal travel. Similar rollers shall also be mounted on lower part of power unit frame on side facing building.
- F. Monorail track, tractor and climber basket trolley shall be as follows:
1. Monorail track - Imperial #4008 formed to suit building configuration.
 2. Monorail tractor - Imperial #T3A50M2 with tow bar. 1/2 HP, 104/208V, single phase, 60 cycle.
 3. Climber basket trolley - Imperial #3925 - 1/2 four wheel trolley with attachment eye for Albina Climber basket. Trolley to be equipped with two current collectors.
 4. Conductor bars - Duct-O-Bar #908 safety type conductor bar. 90 amp. capacity supported from the monorail track.

10C-07 MANLIFT

Furnish and erect in place Bodison Manufacturing Company's (San Francisco) Manlift, or approved equal. Units shall be complete and operable in all respects and shall be as indicated on drawings (including approved shop drawings) and shall conform to requirements of State of California Department of Industrial Relations-Elevator Safety Orders and City of San Francisco Building Code.

10C-08 DOCK BUMPERS

Rubber dock bumpers shall be as detailed on drawings. Install bumpers horizontally as indicated on drawings, including approved shop drawings. Bumpers shall be as made by Pawling Rubber Co., Koffler Sales Corporation (Los Angeles), or approved equal.

LAUNDRY CHUTE

Laundry chute shall be Wilkinson Chutes, Inc.'s W21BSH28 Linen Chute, or approved equal. Unless otherwise indicated on drawings, including approved shop drawings, chute shall be as follows:

- A. Fabricate chute from #16 ga. aluminized steel, lock-seamed and slip-jointed without bolts, clips, or rivets. Interior surface to be smooth and without projections or depressions. Provide one expansion joint per story to prevent expansion from cracking walls around chute doors.
- B. Intake doors shall be 24" wide x 24" high, stainless steel, side hinged, hand operated to open, noiseless self-closing type bearing UL 1-1/2 hr. 250°F. "B" label. Doors shall be removably bolted to intake throats formed into chute tube.
- C. Discharge shall have Type "A" rolling door with 28" sliding door bearing UL 1-1/2-hr. 250°F. "B" label. Door shall be supported by 4 rollers riding in inclined tracks and shall be held open with fusible link.
- D. Top of chute is to be extended full size to level as indicated; cap chute above top intake and extend vent through roof, to weather cap as indicated.
- E. Chute shall be spray coated at factory with sound deadening material.
- F. Chute shall be equipped with Wilkinson's "disinfecting and sanitizing unit", of type which allows flushing and disinfecting the chute in one operation.
- G. Chute shall have 1" IPS flushing spray head for connection to hot water by other and 1/2" IPS automatic sprinkler for connection to sprinkler system by others located just above the top intake. Chute shall have additional 1/2" IPS sprinkler heads as required by local code.
- H. All chute equipment shall be fully factory-assembled in maximum of two sections per story ready for erection at job site. Field work shall be confined to setting chute in place, anchoring it, and connecting necessary services.

10C-10

TRASH CHUTE

Trash chute shall be Wilkinson Chutes, Inc.'s W5BRA28 Rubbish Chute, or approved equal. Unless otherwise indicated on drawings, including approved shop drawings, chute shall be as follows:

- A. Fabricate chute from 16 ga. aluminized steel, lock-seamed and slip-jointed without bolts, clips or rivets. Interior surface to be smooth and without projections or depressions. Provide one expansion joint per story to prevent expansion from cracking walls around the chute doors.
- B. Intake doors shall be 24" wide and 24" high, stainless steel, bottom hinged, hand operated to open, noiseless self-closing type. Doors shall be removably bolted to intake throats formed into chute tube.
- C. Unless otherwise indicated on drawings, discharge shall be open end type with 28" x 28" Type "A" horizontal inclined rolling aluminized steel door held open with a fusible link.
- D. Chute shall be spray coated at factory with sound deadening material.
- E. Top of chute shall terminate above roof, as indicated.
- F. Chute shall have 1" IPS flushing spray head for connection to hot water by applicable trade and 1/2" IPS automatic sprinkler (for connection to sprinkler system under other sections of these specifications) located just above top intake. Chute shall have additional 1/2" IPS sprinkler heads as required by local code.
- G. All chute equipment shall be fully factory-assembled in maximum of two sections per story ready for erection at job site. Field work shall be confined to setting chute in place, anchoring it, and connecting necessary services.

10C-11

ALUMINUM LOUVERS

Provide aluminum louvers, with screens, in exterior walls as indicated. Louvers shall be equal to Airolite's #638 of sizes indicated and shall be of bronze anodized aluminum, unless otherwise indicated. Louvers shall be complete with screens, frames, mullions, (where required by louver size) flashings, stainless steel fastenings and other

accessories required for complete, secure, watertight installations. Install per approved manufacturer's current written recommendations for these installations. Louvers shall be as made by Construction Specialties, Inc., or approved equal.

10C-12 PORTABLE STAGE

Provide portable stage shall be Wenger Corporation's (or approved equal) Type B Universal Portable Stage. Provide sufficient units (nominal 4' x 8') for stage size indicated.

- A. Tops - 1/2" 5-ply laminated tops. Solid core exterior grade mill-finished tempered hardboard both faces.
- B. Steel legs with broad face plates.
- C. Frame-Edging - Solid steel electrically welded, one-piece unitized frame and edging. Riveted construction, no screws.
- D. Adjustable Legs - Height adjustment from 18" to 51" with three sets of legs. Each leg shall have two adjustments: one for speedy gross adjustment; other screw type for fine adjustment; no tools required.
- E. Finish - All metal parts bright zinc plated.
- F. Capacity - Each unit shall support 2000 lbs. live weight.

10C-13 SEISMIC JOINT COVERS

Seismic joint covers shall be of materials fabricated as detailed and installed as detailed. Standard manufactured joint covers as made by Metaline, Inc., Architectural Arts, Mfg. Co., or other approved manufacturers meeting these requirements will be acceptable.

10C-14 CANVAS AWNINGS

Canvas awnings shall be as indicated ~~and shall be same as awnings on existing St. Francis Hotel building.~~

10C-15 LIQUID FILLED BUMPER GUARDS

Bumper guards at columns shall be John Rich Enterprises (Sacramento, Calif.) flexible vinyl Hi-Dro Cushion Cells of types and sizes required.

10C-16 PROJECTION SCREENS

Provide Ralke Co., Inc. (Los Angeles, Calif.), or approved equal, projection screens as indicated and as follows:

- A. Mezzanine Function Room: Electrol Standard Projection Screen, size 12' by 12', electrically operated, 115 Volt AC 60 cycle. Three wire quick reversal motor to be especially designed for purpose, to be ball bearing and oiled for life, with automatic thermal overload cut-out and intergral interlocking gears. Fabric to be non-glass mat white surface. Unit to be listed by Underwriters Lab Inc. Unit to be dual controlled from stage or projection booth.
- B. Second Floor Meeting Rooms: Same as for Function Room, except that screen size shall be 8' by 8', with standard single control operation. Surface fabric to be non-glass mat white surface.

10C-17 TACKBOARDS

Provide for Display Units, and elsewhere as indicated, Claridge Products & Equipment, Inc.'s 1/4" thick "Fabricork" vinyl plastic covered cork of color and pattern as selected by Architect.

10C-18 ROOF HATCHES

Provide, where indicated and as detailed, a Bilco Co.'s Type S single-leaf and Type D double-leaf roof hatches of sizes indicated, cover and curb shall be of No. 14 gauge steel, prime coat painted. Hatches shall be completely assembled with heavy brass hinges with stainless steel pins, compression spring operators, positive snap latch with turn handles on inside and outside, and neoprene draft seal. Install in weathertight and watertight manner per manufacturer's recommendations and as indicated.

10C-19 SHOWER DOORS

Shower doors shall be Agalite Bronson, or approved equal as made by "Aqua King". Sliding doors shall be glazed with tempered glass. Doors shall be satin anodized aluminum (unless otherwise indicated) framed and shall be complete with tracks and all operating hardware necessary for the required first-class and workmanlike installations.

10C-20 TRASH COMPACTOR

Trash compactor shall be The Heil Co.'s Model 1035 "Heil Hugel-Pac Stationary Packer System" unit, complete with all appurtenances and accessories required for complete and operable unit.

10C-21 DRAPERY TRACKS AND CURTAIN MACHINE

- A. Provide Automatic Devices Co.'s "Besteel" Model 170 stage track assembly, complete and operable in all respects, for proscenium in Function Room and elsewhere as indicated.
- B. Curtain Machines shall be fully automatic type equipped with 1/4 HP motor direct-connected through flexible coupling to double reduction rear unit, on the output drive shaft of which shall be mounted elevator-type traction pulley delivering a cable speed of 86 feet per minute equivalent to curtain separation speed of 3 feet per second. Remote control panel shall provide reversing action at any point along the travel and shall be composed of three toggle-type switches, one for remote control and two for limit selectors to provide two intermediate stops between end stops. Limit switch adjustments shall be mounted integrally with secondary reduction of gear unit. Machine shall be equipped with ball-bearing idler-wheels, automatic overload protective breaker, and facility for conversion to hand operation. The entire mechanism shall be mounted on heavy base. Model 944 as manufactured by Automatic Devices Company of Allentown, Pa.

10C-22 INSTALLATION

With exceptions specified herein and/or indicated on drawings (including approved shop drawings), all items specified to be provided herein shall be installed per applicable approved manufacturer's current written recommendations and instructions and as necessary to obtain required first class and workmanship (in Designer's opinion) installations.

10C-23 SAUNA BATH

- A. Sauna Bath in Mandarin Suite (and elsewhere if so indicated) shall be Cecil Ellis Sauna Corp's (20 West 58th Street, New York City, N.Y. 10019) "Ellisauna", of size indicated.
- B. Exposed interior walls shall be redwood.

- C. Interior: Walls and ceiling shall be redwood kiln-dried to an average moisture content of 12% or less. The average thermal conductivity (k) across the grain shall be a maximum of .75 BTU/H-in. sq.ft.° F. Walls and ceiling construction shall be 2" x 3" framing insulated with combination of vermiculite and full thick fiberglas, with vapor barriers at appropriate locations.
- D. Air Circulation: Special indirect air flow system shall be provided within walls. Heat shall be convected through rocks, not radiated.
- E. Provide "Ellisauna" Model M17 Sauna stove (authentic importation from Finland), 1.7KW, with BTU output of 8000. Stove shall be 220V: single or three phase, 60 cycle, stainless steel and cast aluminum construction; two-circuit system with easy access controls. Elements shall be fully insulated. Push-button, signal-lamp control panel with remote control relays shall be located outside hot room. Adjustable thermostat, calibrations shall be 160°-260°F. Capillary tube to be on thermostat. Furnace shall hold 110 pounds of special igneous rocks imported from Finland. Unit shall be protected from water damage and shock hazard. No electrical heating or functional parts to be exposed. U.L. APPROVED.
- F. Stove Guard: Wall area around stove shall be protected by special fireproof materials. Provide wood guard rail around stove.
- G. Electrical: All wiring shall comply with local and state ordinances. Electrical units shall be completely pre-wired within fabricated wall and ceiling panels. Electrical hook-up to power supply to be performed under specification Section 16.
- H. Bench Assemblies shall be provided and installed on wall supports and legs. Benches shall be clear kiln-dried sugar pine and shall be provided with 1/2" spacing between boards and placed according to approved layout.
- J. Provide recessed lighting fixture with glass panel and switch on outside wall.
- K. Door shall be special design, hand-crafted, triple-thick, insulated door. Door size shall be 6'2" x 2'0" x 2-1/4", with double glazed window and shall be pre-hung.

- END -

SECTION 10D

SOUND REINFORCEMENT SYSTEM

Requirements of Division 1 apply to work of this Section.

10D-01 SCOPE

Provide sound reinforcement and sound effects systems as indicated and specified, complete.

10D-02 WORK INCLUDED IN THIS SECTION

Principal items of work include:

- A. Sound reinforcement system, complete with all necessary equipment and apparatus as specified, for Main Function Room.
- B. Sound reinforcement system, complete with all necessary equipment and apparatus as specified for the Sky Bar.
- C. Sound reinforcement system, complete with all necessary equipment and apparatus as specified, for the California/Mural Rooms.
- D. Sound reinforcement system, complete with all necessary equipment and apparatus as specified, for the Meeting Rooms.

10D-03 WORK NOT INCLUDED IN THIS SECTION

- A. Building intercommunication systems.
- B. Video systems.
- C. Conduit and electrical boxes specified under Section 16.
- D. Background music system.

10D-04 GENERAL REQUIREMENTS

- A. Definition: In this Section, the term "Contractor" shall mean "Sound Systems Contractor".

- B. General: Provide high quality sound systems as set forth with all equipment and apparatus to be supplied by the Contractor to ensure, upon completion, that all systems are in excellent working order. For convenience, functional diagrams are presented in drawings showing the interconnection of the major components.
- C. Contractor's Responsibilities: Responsibilities of Contractor, under this Section, include but are not limited to: supplying of a total working system(s); verification of completeness of equipment listed; verification and installation of manufacturer's type numbers of specified components including manufacturer's current model change-over where applicable; verification of overall suitability of system and its components specified to meet functional and performance requirements and the furnishing of additional equipment to meet functional requirements without claim for additional compensation.
- D. Contractor's Qualifications: Contractor under this Section shall be a licensed/franchised representative of a major audio equipment manufacturing company.
- E. Information Required With Bids: Each bidder shall submit with his bid a complete and separate list of all major components and the quantities of each, proposed for use in this installation.
- F. Submittals: Conform to General Conditions and requirements herein.
- (1) Schedule: Prior to commencement of installation, the Contractor shall submit an outline of his proposed procedures and schedules, coordinated with the General Contractor. The Designer reserves the right to modify or disapprove such procedures or schedules.
 - (2) Block Diagrams and Shop Drawings shall be prepared by the Contractor showing interconnection of all major components, details of rack mountings, and for details of suspension members for loudspeakers. All shop drawings shall be submitted to the Designer for approval prior to commencing the work indicated.
 - (3) Demonstrations: Perform demonstrations of equipment operation as required for approval or selection.

- G. Permits and Inspections: Sound Systems Contractor shall obtain and pay for all permits and inspections pertaining to work of this Section as required by governmental authorities having jurisdiction.
- H. Codes, Rules, and Regulations: Work and materials shall be in accordance with latest regulations and requirements of Federal, State and Municipal Laws, Codes, and Regulations, having jurisdiction. In cases of conflict, or degree of requirement, the more strict code or standard shall apply. Contractor shall be responsible for testing and securing approval for operation from the responsible legal authority. Nothing in Contract Documents shall be construed as permitting work not in accordance with the above requirements. Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on conduct of work as drawn and specified. If Contractor observes that drawings and specifications are at variance, he shall promptly notify Designer in writing. Any necessary changes shall be adjusted as provided in Contract for changes in work. If Contractor finds any work contrary to such laws, ordinances, rules, and regulations, and proceeds without notice to Architect, he shall bear all costs involved.
- J. Coordination: This Contractor shall coordinate related work with the General Contractor and other Contractors, including conduit and wiring systems serving sound systems equipment items.
- K. Contractor's Supervision: It shall be the Contractor's responsibility under this Section to coordinate his work with all other trades in scheduling and equipment use and to retain the services of a single full time qualified Senior Technician to oversee the installation throughout the course of the project. Periodic inspection and supervision shall be carried out by a Senior Engineer to ensure that the system installation is in accordance with the specification.
- (1) Staffing: The Contractor shall maintain adequate staffing on the job to ensure that scheduling of the system installation coincides with overall scheduling.

(2) Conflicts: Where conflicts develop, it shall be the responsibility of the Contractor, at no additional cost to the Owner, to coordinate his work with other trades and to make any necessary moderate moves and changes to accommodate other equipment or aesthetic requirements as required by the Designer.

L. Changes: Any system changes and substitutions proposed by the Contractor to that specified shall be submitted not later than five working days prior to bid opening and approved in writing by the Designer.

M. Operating Instructions: Prior to completion of this work, submit rough drafts of maintenance and operation manuals to Architect detailing routine and corrective maintenance procedures and operation. Manuals shall also include block diagrams showing interconnection of all major components, their functional relationships and all switching, wiring and functional diagrams, descriptions of systems functions and manufacturer's technical data sheets and maintenance instructions book on all system components. Subsequent to approval, provide 3 copies of manual including suitable schedules of routine maintenance recommendations and pertinent operating data in loose leaf binders. In this binder, also provide 1 copy of information for each item of equipment with spare parts list and other data regularly supplied by the manufacturer. Go through manual with Owner, demonstrating and explaining all operating procedures.

N. Guarantee: In accordance with General Conditions and as specified in Article 10D-15.

10D-05

MATERIALS AND EQUIPMENT

- A. All materials and equipment provided by the Contractor in execution of work shall conform to applicable provisions of the UL and USASI. In addition, all equipment shall be new and of current manufacture model at the time of installation.
- B. When the equipment, as specified, refers to manufacturer's model type number it is the intent to indicate a quality and performance standard. Proposed substitutions to equipment specified shall be made in writing by the Contractor to the Designer and shall be accompanied by Laboratory data which will enable the Designer to determine the acceptability of proposed substitution.

- C. All major components furnished shall have the manufacturers' nameplate affixed with appropriate labelling as to model and serial numbers.

10D-06

SYSTEMS DESCRIPTIONS AND FUNCTIONAL REQUIREMENTS

- A. General Facilities Description: Sound reinforcement systems specified for the various function rooms are designed as basic systems to provide acoustical amplification for live activities originating in the spaces and also for recording of activities by master recorders in the sound control room. Provision is made for playback of disc and tape recorded material to all spaces from the sound control room. Local recording and playback may be extended to any space by the use of portable equipment but such equipment is not specified in this section.

Paging facilities are provided with announcement from the sound control room with possibility for incorporation of other source locations. Two high level lines each connect the spaces herein referred to, to the sound control room. Provision is made for insertion of time delays into the main function room loudspeaker system at a later date, if in the opinion of the Acoustical Consultant they are required. All loudspeakers which produce coverage to areas of live microphones may be deactivated with relay servo operation,

B. Main Function Room

- (1) Loudspeaker system in this room utilizes a large number of high quality 15" loudspeakers distributed in the ceiling plane to provide an even coverage of sound for both speech and music source signals.
- (2) Source amplification shall be provided by two control room located mixers and one portable preamplifier with switchable speech filters, and power amplifiers of a power output sufficient to provide high level undistorted drive to the loudspeakers. Playback of disc recorded material shall be provided by a console mounted disc player. Playback of tape recorded material shall be similarly provided by a console mounted tape recorder/reproducer which shall also be connected to record the output of the mixer preamplifier.

- (3) Sound control room shall be connected to each space specified by 2 high level lines as indicated on functional diagrams.

C. Skybar

- (1) Loudspeaker system in this room utilizes a large number of high quality 15" loudspeakers distributed in the ceiling plane to provide an even coverage of sound for speech and music source signals.
- (2) Source amplification shall be provided by a portable mixer preamplifier suitably modified to incorporate a speech filter.

D. California/Mural Room and Meeting Rooms

- (1) Loudspeaker systems in these rooms utilize a large number of high quality 8" loudspeakers distributed in the ceiling planes to provide an even coverage of sound for speech and background music signals.
- (2) Source amplification for each divisible space shall be provided by a portable mixer preamplifier suitably modified to incorporate a speech filter.
- (3) A facility is provided for interconnection of the divisible spaces with correct matching of impedances and levels.

10D-07 CONDUITS

A. The following conditions apply to conduit runs:

- (1) Ground all power conduits to the power system ground.
- (2) Insulate microphone and 600 ohm lines from the conduit and from each other for the entire cable length. The same conduits shall be mechanically attached and electrically connected to appropriate receptacles and grounded. Do not splice any lines within conduit runs. Care shall be exercised to preserve isolation of microphone ground from conduit ground. Adherence to manufacturers receptacle mounting instructions is mandatory.

B. Separate conduit lines shall be run for the following:

- (1) Microphone level circuits (below -20 dBm)
- (2) Line level circuits (up to + 30 dBm)
- (3) Loudspeaker level circuits (above + 30 dBm)
- (4) All power circuits
- (5) Telephone lines for broadcast

10D-08

FABRICATION/INSTALLATION

- A. The Contractor shall supply all equipment to ensure fully completed systems as indicated and specified.
- B. In the fabrication and installation, the Contractor shall take all necessary precautions to prevent electromagnetic and electroacoustic hum; to provide proper ventilation for all equipment and to include those safety practices for the audio system operator consistent with good practice.
- C. Suspension and/or anchorage of all permanent equipment such as loudspeakers, amplifiers, etc., shall provide for a rigid connection between the unit and its support point(s) and shall provide a reasonable safety factor.

Labelling of all controls, meters, receptacles, cables, etc., is required; the markings shall be clearly legible and permanently affixed.
- D. Grounding of shields for microphone lines shall occur only at the microphone frame and console input. Grounding of all other shielding shall occur at inputs to power amplifier or outputs of console. Non-grounded ends shall be terminated with "wedge on" collars. Care shall be taken to preserve continuity of shields at all connection points. Grounding of all rack-mounted audio equipment shall be made at a single point on the rack and the rack in turn grounded at a single point to a copper stake or similar wet earth connection.
- E. All wiring joints and connections shall conform to the standard broadcast practices as set forth in the "Recommended Wiring Practices" Broadcast Audio Equipment for AM/FM/TV (5th Edition) RCA, Camden, N. J. 1962.

- F. Due care shall be exercised to ensure that the work is neat and that receptacles, plates, etc., are plumb and square.

10D-09

SYSTEM PERFORMANCE CRITERIA

- A. It shall be the responsibility of the Contractor to install the equipment as specified in the manner specified and in conformance with the manufacturer's recommended installation practices unless otherwise specified.
- B. Components specified have been selected on the basis of technical data furnished by the component manufacturers. If deficiencies are in evidence at the time of final inspection by the Consultant, a measurement program shall be undertaken, by the Consultant, to ascertain the extent of deficiencies in accordance with criteria specified.
- C. In event that a measurement program is undertaken, the frequency response of the system components and the coverage patterns of the loudspeakers as specified hereafter shall be measured with a sound level meter in conformance with IEC Recommendations Publication #179 equipped with a filter set in conformance with IEC Recommendation publication #225. The signal input shall be a source of "noise" having constant energy in each and every octave within the band width 31.5 Hz to 15,000 Hz, such a noise source being termed "Pink" noise. The frequency response shall be measured on the axis of each loudspeaker under test.

Measurements of the uniformity of coverage specified hereafter shall be made using the above apparatus and sound source and with the apparatus set to measure within an octave band centered on 4000 Hz.

For all of the above measurements, the following shall apply.

- (1) All major furnishings and all major areas of acoustical materials shall be in place.
- (2) The measurements shall be made at seated head height.
- (3) The system gain shall be adjusted to produce a "c" weighted sound pressure level of 80 - 85 dB.

D. System Response Main Function Room and Skybar

(1) Frequency response deviation within:

± 4 dB 125 Hz to 8 KHz
 ± 4 dB, - 6 dB 63 Hz to 12 KHz

(2) Uniformity of coverage within ± 4 dB

E. System Response California/Mural Rooms and Meeting Rooms

(1) Frequency response deviation within

± 4 dB 250 Hz to 6.3 KHz
 ± 4 dB - 8 dB 125 Hz to 12 KHz

(2) Uniformity of coverage within ± 4 dB

10D-10

MICROPHONES

Following microphones shall be supplied in the quantities indicated. All microphones shall have an output impedance of 150/250 ohms and shall be balanced to ground.

A. Close talking microphone for use in paging and announcements originating from the sound control position.

Frequency Response/on-axis ± 2 dB 200 Hz - 2500 Hz.
with a peaked response of 4 dB to 6 dB
at 5000 Hz re the on-axis response at
1000 Hz

Sensitivity -60 dBm to -55 dBm

Omnidirectional pickup pattern

Momentary contact "Press to Talk" switch

Furnish with 15' minimum flexible microphone cable

Acceptable types: Electro Voice 619
Altec Lansing 687B

Quantity: Two (2)

- B. Lavalier Microphone: For use in speech reinforcement where mobility of speaker is required and/or microphone concealment is desired.

Frequency Response - ± 3 dB 200 Hz to 2 KHz
with preferred deviations of + 5
dB to + 8 dB between 4 KHz and 8
KHz and a preferred loss of -6
dB to -10 dB at 100 Hz

Sensitivity -65 dBm/-55 dBm

Furnish - Minimum 15' of flexible, shielded cable of neoprene, rubber or vinyl covering and lapel clip for each.

Acceptable Types: AKA D109
Shure SM51
RCA BK-12A
Electro Voice 649B

Quantity: Ten (10)

- C. Cardioid Directional (Dynamic): For use in general speech reinforcement in those cases where feedback is likely to occur.

Frequency response on axis - ± 3 dB 60 Hz to 12 KHz

Front to Back Discrimination - Greater than 10 dB
150 Hz to 1500 Hz
Greater than 15 dB
1500 Hz to 10 KHz

Sensitivity -60 dBm to -50 dBm

Furnished with 15' minimum flexible microphone cable, tiltable mount and supporting hardware and calibration curve for each.

Acceptable Types: AKA D-200E
Electro Voice 665
Altec Lansing 689B
RCA BK-58

Quantity: Sixteen (16)

- D. Omnidirectional (Condenser): For use in high quality music and speech recording and reinforcement in those cases where directional microphones are either unnecessary or unsuitable.

Frequency Response - ± 3 dB 40 Hz to 15 KHz

Sensitivity -35 dBm to -55 dBm

Furnish with 15' minimum of flexible cable and appropriate antishock mounts for stand use.

Acceptable Types: AKG C451 with capsule
CK2 or
Altec Lansing M51 system

Quantity: Four (4)

- E. Cardioid Directional (Condenser): For use in high quality music and speech reinforcement in those cases where feedback is likely to occur.

Frequency Response on axis ± 3 dB 40 Hz to 15 KHz

Front to Back Discrimination - Greater than 15 dB
150 Hz to 5 KHz
Greater than 10 dB
5 KHz to 15 KHz

Sensitivity -35 dBm to -55 dBm

Furnish with 15' minimum of flexible cable and appropriate antishock mounts for stand use.

Acceptable Types: AKA C451 with capsule
CKI or
Altec Lansing M49 system

Quantity: Ten (10)

10D-11

MICROPHONE ACCESSORIES

The following microphone accessories shall be supplied in the quantities indicated:

- A. Floor Stands: Floor stands shall be adjustable in height from 37" to 64" and shall accept all microphone types specified herein.

Acceptable Types: AKA ST 101
Altec Lansing 22C
RCA MI-11021-8
Atlas MC-20

Quantity: Ten (10)

- B. Desk Stands: Desk stands shall be shock resistant type for use with the specified close talking microphone. In addition, they would be used for panel discussions.

Acceptable Types: AKA ST 305
Altec Lansing 34A
Electro Voice 422

Quantity: Ten (10)

- C. Microphone Receptacles: Microphone receptacles shall be capable of receiving Cannon SLA-3-12C, Amphenol 91-855 and Switchcraft A3M connectors. They shall be located as shown on the drawings. Plates for electrical boxes shall be provided as required.

- D. Microphone Lines: Microphone lines shall be Belden Type 8762 for individual runs between microphone receptacles and patch terminals in audio equipment room.

- E. Microphone Extension Cables: Microphone extension cables shall be Belden 8412 or Birnback 772 fitted with appropriate connectors as specified herein.

Quantity: Twenty (20) - 10' each
Twenty (20) - 25' each

- F. Cover plates shall be provided and installed at all audio system electrical boxes.

Quantity: As required.

10D-12

CONTROL FACILITIES AND EQUIPMENT

- A. Mixer Preamplifiers

All mixer preamplifiers referred to in this specification shall meet or exceed the following performance specification:

The mixer preamplifier shall be a factory fabricated solid state unit capable of amplifying and mixing not less than 5 microphone inputs or 4 microphone and 2 line level inputs to produce one combined line level output monitored by a V. U. meter. In the case of the Altec Lansing option additional external circuit components as listed and indicated on the functional diagram are required.

Gain 85 dB

Frequency Response: \pm dB 20 Hz to 20 KHz

Output Level: + 18 dBm at 0.5% THD 30 Hz to 20 KHz

Preferred Source Impedance: Microphone 150 ohm to 250 ohm
Line level not greater than 600 ohm

Equivalent Input Noise: Less than -120 dBm

Acceptable Types: James B. Lansing Procast #5600 with (6) XT10 transformers, (1) AMC-2 accessory and (3) MBT-10 transformers or Altec Lansing 1592A with (5) 1588A input transformers, (1) 41222 VU meter

Quantity: Main Function Room - Two (2)
Sky Bar - One (1)

B. Portable Mixer Preamplifiers

- (1) The portable mixer/preamplifier shall be mounted in a carrying case equipped to permit mounting of the mixer/preamplifiers, and a sub panel fashioned to carry the additional circuit components as indicated on the functional diagram SS16. Panels shall have identical finishes. Output connection shall be made via a multi-pin Amphenol type connector (e.g. Wire

Form Mighty Might 222 series or equivalent) which shall carry all lines exclusive of the mixer/preamplifier inputs. The carrying case shall have removable front and rear panels and shall include space for internal storage of all pertinent connection cables. All input and output receptacles as indicated on the functional diagram shall be accessible at the rear of the unit.

Acceptable Units: Mixer preamplifiers as specified in Section 13.a with the following additives for the Altec Lansing Alternate Rotary mixers RM 8200 MM Two
(2) Transformers 15095 Two (2)

Quantity: Main Function Room One (1)
California Mural Room Two (2)
Meeting Rooms Two (2)
Total Quantity: Five (5) complete units

- (2) Extension cables shall be provided for the 13b(1) items fitted with connectors mating to those specified therein. The cable shall be 25 feet in length, armored and provide for adequate isolation between adjacent cable pairs.

Quantity: Ten (10) cables

C. Fixed High Pass Filters

To remove excess low frequency audio signals, permanently install high pass filters as indicated on the functional diagrams. The units shall provide a 12 dB/octave minimum roll off at 70 Hz or 50 Hz.

Acceptable Types: United Transformer Co.
HML 50 and HML 70
or
Altec Lansing 9066A-50
and 9066A-70

Quantity: HML 70 or 9066A-70 Four (4)
HML 50 or 9066A-50 Two (2)

NOTE (Case only shall be grounded)

D. Speech Filters

To improve speech intelligibility switchable speech filters shall be provided as indicated in the functional diagrams. The units shall provide a 12 dB/octave minimum roll off below 200 Hz.

Acceptable Types: United Transformer Co.
HML 200 or
Altec Lansing 9066A-200

Quantity: Eight (8)

NOTE (Case only shall be grounded)

E. Main Function Room Audio Console

This Contractor shall furnish a desk of sturdy construction with laminated plastic top. Desk top to be not greater than 26" above floor; depth of desk not to exceed 30" and length of desk to be not less than 60". Provisions shall be made for mounting the mixer/preamplifier, disc reproducer and tape recorder/reproducers.

F. Phonograph Equipment

- (1) Transcription Turntable: Furnish and install a two speed console mounted disc reproducer having stereophonic playback capability. The turntable shall operate at 33-1/3 and 45 rpm.

Acceptable Types: Thorens TD 150 AB Transcription turntable with integrated tone arm and Shure Brothers M75E Cartridge.

Quantity: One complete assembly

- (2) Phono Preamplifier: Furnish and install a console mounted phono preamplifier which shall conform within ± 1 dB of the RIAA specification for disc reproducer equalizers. The unit shall be adjusted to produce an output level of + 4 dBm from each channel when the pickup is reproducing a recorded level of 3.5 cm/sec recorded velocity at 1 KHz.

Acceptable Types: Shure Brothers SE-20

Quantity: One (1)

G. Magnetic Tape Equipment

Tape Recorder/Reproducer: The tape recorder/reproducer shall be a 2 channel stereophonic machine operating at speeds of 7-1/2 and 3-3/4"/sec. and handling 1/4 magnetic tape on 8-1/4" maximum diameter reels. Recording shall be made on twin half tracks and reproduce shall be available from twin half or twin quarter tracks. Separate record and reproduce heads shall be supplied. The electrical, magnetic and mechanical performance shall conform to N.A. B. standards and to the manufactures published specification for the tape unit.

Acceptable: Magnecord Model 1022

Quantity: Two (2)

H. Hybrid Mixers

Hybrid mixers shall be provided as indicated on the functional diagram. These units shall be passive transformer units which provide a signal which is the sum of two inputs while maintaining signal isolation between the two inputs.

Acceptable units: United Transformer Company #A48

Quantity: JEL Alternate Two (2)
Altec Lansing Alternate Three (3)

10D-13

RACK MOUNTED EQUIPMENT

A. Power Amplifiers

The power amplifiers shall be rack mounted in the audio control room and shall be of the solid state type. The output impedance connection shall be as indicated on the functional diagram. Protection of circuit components against output overload or short-circuiting shall be an integral feature of the unit.

- (1) Amplifier units coded AI on the functional diagrams shall conform to or exceed the following performance characteristics:

Output Connection: 70V

Maximum Power Output: 325 watts at less than 2% THD from 50 Hz to 10KHz

Input Sensitivity: -12 dBm for rated power
with transformer

Frequency Response: + 1 dB 40 Hz to 15 KHz at
rated power

Noise at Output: Greater than 83 dB below
rated power

Source Impedance: 600 ohm with transformer

Acceptable Units: McIntosh MC 3500 with trans-
former M-107
or
Altec Lansing 1595A with
transformer 15095

Quantity : Four (4)

- B. Amplifier units coded BI on the functional diagrams shall conform to or exceed the following performance characteristics:

Output Connection 70V

Output Power: 100W rms at less than 1% THD 50 Hz
to 20 KHz

Input Sensitivity: 0.8V rms for rated power

Frequency Response: + 1 dB 50 Hz to 20 KHz at rated
power

Noise: Greater than 85 dB below rated power

Input Impedance: 15,000 ohms or 600 ohms

Acceptable Units: Altec Lansing 1594A with transformer
15335 or 15095 as appropriate

Quantity: Eight (8)

- C. Amplifier units coded CI on the functional diagrams shall conform to or exceed the following performance characteristics:

Output Connection: 16, 8 or 4 ohms
Output Power: 105 watts rms per channel with both channels operating at less than 0.25% THD 40 Hz to 20 KHz
Input Sensitivity: 0.5V rms for rated power
Frequency Response: \pm 0.25 dB, 40 Hz to 20 KHz at rated power
Noise: Greater than 90 dB below rated power
Input Impedance: 200,000 ohms
Acceptable Unit: McIntosh MC 2100 dual amplifier unit with appropriate transformers
Quantity: Six (6)

D. Control Room Monitor Amplifier

The control room monitor amplifier shall conform to or exceed the following performance characteristics:

Output Connection: 8 ohms
Output Power: 50 watts rms at less than 0.25% THD from 20 Hz to 20 KHz
Input Sensitivity: 0.5V rms for rated power
Frequency Response: \pm 0, - 0.25 dB 20 Hz to 20 KHz at rated power
Noise: Greater than 90 dB below rated output
Input Impedance: Modified to 60 K ohm
Acceptable Unit: McIntosh MC 250 with U.T.C. transformer LS26
Quantity: One (1)

E. Patching Facilities:

Rack mounted patch panels shall be furnished in accordance with the requirements indicated in the functional diagram. All jacks shall be clearly and permanently labeled. All jack frames shall be tied together but not grounded at patch panel. Shielded patch cords shall be supplied with appropriate connectors.

Acceptable Jack Strips: Audio Accessories - 110F
fitted with type 320A Jacks
ADC Products PJ 393 ..
RCA MI-11666
Langevin JS-7160 with
J-7111-B Jacks

Quantity: As required

Acceptable Patch Cords: Audio Accessories - 254B
ADC Products PJ-84
Langevin PC-7107-4

Quantity: Ten (10)

Acceptable Patch Cords: Audio Accessories - 252B
ADC Products PJ-82
RCA MI-4652-D2
Langevin PC-7107-2

Quantity: Twenty (20)

F. Switching:

- (1) The functional diagram indicates the major switching required to meet the functional requirements. Any additional miscellaneous switching for the audio system as required shall be provided. The switches shall be located in the equipment rack and clearly labeled as to function and position. The units when installed shall have a safety factor of 2 in voltage and amperage rating.
- (2) Input selector switches shall be provided as shown in the functional diagram. Each switch shall be interlocking with a lock out feature and shall be clearly labeled. Switches shall have "Glow-Button" feature.

G. Miscellaneous Rack-Mounted Equipment:

- (1) Provide an A.C. power control switch to activate all rack-mounted equipment.
- (2) Provide a ventilation fan and filter/grill at the lower rack level to ensure proper ventilation.
- (3) Provide blank panels on each rack face to complete enclosure.

H. Equipment Racks for Sound Control Room: Furnish and install fully enclosed two door equipment rack of standard 19" panel width and an overall panel height of 70". Blank off panels shall be provided in openings not occupied by equipment.

Acceptable Types: Bud #CR-2175

Quantity: One (1)

J. Magnetic Tape Time Delay:

- (1) A magnetic tape time delay unit shall be provided for incorporation into sound amplification of Main Function Room. Delay times shall be inserted at point and for values indicated in Main Function Room Functional Diagram.

Unit shall serve to preserve directional realism when sound sources are positioned at west stage platform.

Unit shall be rack mounted in Control Room and shall equal or exceed following performance characteristics:

Frequency response:	200 - 8000 Hz \pm 1 dB
	50 - 9000 Hz \pm 2 dB
Wow and Flutter:	less than 0.3%
Signal to noise ratio:	greater than 58 dB
Minimum time delay:	15 millisec
Maximum time delay:	200 millisec
Incremental delay adjustment:	15 millisec
Acceptable unit:	Philips/Norelco EL 6911/02
Quantity:	One

LOUDSPEAKERS AND ASSOCIATED EQUIPMENT

- A. All loudspeakers listed under this heading with the exception of the sound control room monitor loudspeakers shall be full frequency range dual concentric loudspeakers with the following performance characteristics:

(1) 15" loudspeakers

Power Handling Capacity:	35 watts minimum continuous program
Nominal Impedance:	8 or 16 ohms
Frequency Range:	40 Hz to 15 KHz
EIA Sensitivity:	Not less than 50 dB
Angular Dispersion:	90° minimum
Division Frequency:	1000 to 1600 Hz
Acceptable:	JBL Model 2150 with dividing network model 3125 or Altec Lansing Model 615AB with transformer 15066
Quantity: Skybar	615AB Sixteen (16) 15066 Sixteen (16) 2150 Sixteen (16) 3125 Four (4)
Main Function Room	615AB Thirty (30) 15066 Thirty (30) 2150 Thirty (30) 3125 Nine (9)
California/Mural Room	615AB Two (2) 15066 Two (2) 2150 Two (2) 3125 Two (2)

(2) 8" Loudspeakers

Power Handling Capacity:	16 watts minimum continuous program
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Nominal Impedance: 8 ohms
 Frequency Range: 70 Hz to 12 KHz
 EIA Sensitivity: 46 dB minimum
 Angular Dispersion: 90° minimum
 Division Frequency: 2000 Hz
 Acceptable: Jensen K950 with James B. Lansing transformer 7008
 or
 Altec Lansing 409B with transformer 15065

Quantity: California/Mural Room Seventy-three (73)
 Meeting Room Sixty (60)

B. Control Room Monitor Loudspeaker

Furnish and install full frequency range monitor loudspeaker in a walnut finished enclosure. Unit shall be mounted above Control Room window oriented down to the control position.

Acceptable Types: James B. Lansing Lancer 77
 KLH Model Six

Quantity: One (1)

C. Loudspeaker Distribution Lines

Loudspeaker distribution lines shall be screened between the amplifier output and the entry into the conduit. The wire gauge shall be such that the total return line resistance shall not be greater than 1/10th of the amplifier output matching impedance.

Acceptable Cable: Belden #8471, 8473 or 8477 or Other equivalent.

D. Loudspeaker Muting for 15" Loudspeakers

15" loudspeakers indicated with * shall be mutable when microphones are used in their coverage pattern. Control

switches shall be located on a hidden panel on the wall in each of the operable spaces and shall be positioned in a matrix which is a mirror image of the ceiling loudspeaker locations. Each switch shall operate a relay with mercury wetted contacts which shall mute the desired loudspeaker and in the case of the JBL alternate shall substitute a load of 8 ohms for each loudspeaker component removed from circuit.

Contact suppression shall be provided according to manufacturers recommendations.

Acceptable Relays: Automatic Electric V52 MC52

Quantity: As required

E. Loudspeaker Muting for 8" Loudspeakers

Loudspeakers indicated with * shall be mutable when microphones are used in their coverage pattern. Control switches shall be located on a hidden panel on the wall in each of the operable spaces and shall be positioned in a matrix which is a mirror image of the ceiling loudspeaker locations. Each switch shall be wired in the 70 volt line to the mutable loudspeaker.

10D-15

INSPECTION/SUBMITTALS/GUARANTEE

- A. Final Adjustments and Submittals: Upon completion of the system installation and prior to the Owners final acceptance testing, the Contractor shall be responsible for the following:
- (1) Submit to the Owner 2 copies of a simplified block diagram showing the interconnection of all major components, their functional relationships and all switching.
 - (2) Provide 2 copies of an operations manual describing system functions and manufacturer's technical data sheets and maintenance instruction book on all system components. Wiring and functional diagrams shall be included.
 - (3) Conduct preliminary tests and perform necessary adjustments to ensure that: the overall system is

working satisfactorily; all microphone inputs are functioning and are appropriately labelled at terminal points; reproduction levels of each loudspeaker are uniform and in accordance with performance requirements as herein specified for all inputs from live source positions and rack-mounted source equipment. If any deficiencies in performance are in evidence, this Contractor shall be required to furnish the equipment and perform the required work to modify the system performance to meet the specifications.

The Contractor under this Section of the specifications shall be responsible for the satisfactory operation of the equipment to the technical literature released by the manufacturer on the equipment specified.

To ensure overall system conformance and frequency response with conditions specified, the Contractor shall, at no additional cost, furnish up to 3 additional sections of equalization. Further, this Contractor shall be responsible for adjusting the gain of the power amplifier and for the proper setting of loudspeaker transformer taps to meet the requirements as specified for the sound pressure levels and for uniformity of coverage.

Upon completion of the initial adjustments, the Contractor shall set and temporarily mark all level controls for normal operation, set all variable spectrum shaping networks in "flat" position and lock rack-mounted level controls in optimum position for maximum signal-to-noise ratio and adjust for balanced levels for all sources.

Upon completion of the above, the Contractor shall notify the Owner in writing that preliminary testing is completed and that the system is ready for final inspection.

B. Final Acceptance:

- (1) Final acceptance of the system installation will be made when the Contractor successfully demonstrates that the system conforms with the conditions specified.
- (2) If the subjective and performance testing of the system indicate the need for further adjustments, it shall be the Contractor's responsibility to make the adjustments to meet the conditions specified. The time required for

acceptance testing and system modifications required to meet the performance criteria shall not exceed 2 days under this Contract. Costs for additional time on site required by the Consultant plus any direct costs incurred shall be borne by the Contractor at Consultant's standard per diem rates.

- (3) Final acceptance tests shall be undertaken by the Acoustical Consultant with this Contractor in attendance at all times during the test procedures. The Contractor shall demonstrate operation of the total system using all equipment specified in the manner specified. Subjective listening tests will be conducted by the Acoustical Consultant. If it is evident that the system is not functioning properly, the Contractor shall be required to demonstrate the performance of certain of the components (as determined by the Consultant) to ascertain their acceptability. Frequency response measurements and uniformity of coverage of sound may be part of these tests conducted under the direction of the Acoustical Consultant.

C. Contractor Submittals:

- (1) The bid submittal shall be accompanied by a complete and separate list of all major components and the quantities of each, proposed for use in this installation.
- (2) Block diagrams and shop drawings shall be prepared by the Contractor showing the interconnection of all major components, details of rack mountings, and for details of suspension members for loudspeakers and enclosures. All shop drawings shall be submitted to the Designer for approval prior to commencing the work indicated therein.

D. Guarantee:

All equipment furnished under this Section of the specification shall be guaranteed by the Contractor to be in excellent working order, free of defects and poor workmanship and to perform satisfactorily for a period of one year. Any defective component will be replaced in place in the field at not cost to the Owner for a period of 12 months following the final acceptance. Bi-monthly inspection visits shall be undertaken by the Contractor during the guarantee period at the Contractor's expense. Service calls shall be completed by the Contractor within 24 hours of notification by Owner or his representative.

- END -

SECTION 14A

ELEVATORS

Requirements of Division 1 apply to work of this section.

14A-01 SCOPE

- A. Required: All labor, materials, plant, equipment and facilities necessary for the fabrication, delivery and installation of all Elevators complete, as shown on drawings and/or specified herein, including but not limited to the following:
1. Passenger and service elevators as described herein.
 2. Control systems.
 3. Miscellaneous accessories required for complete installation ready for operation.
- B. Not Included Under This Section:
1. Legal hoistways.
 2. Waterproofing of pits.
 3. Concrete and/or structural steel framing supports for guide rail brackets and machine beams.
 4. Properly lighted and ventilated machine room.
 5. Furnishing and installation of power, signal and light connections as follows:
 - a. To terminal studs of controller or starter including suitable fused disconnect switch in the elevator machine room.
 - b. To relay panel with fused disconnect switch in elevator machine room, when required.
 - c. To light outlet in the hoistway.

- d. Whatever cutouts, circuit breakers, lightning arresters or other devices are necessary to meet local requirements.
6. Electric light and convenience outlet in pits and hoistways.
7. Furnishing, during the erection of the elevators, electric power of the necessary characteristics to provide illumination, operation of required tools and hoists and current for starting, testing and adjusting the elevators.
8. Installation of bolts, anchors, etc., furnished under this section.
9. Ladder to pits.
10. Metal grating or concrete floors at the machine room level or metal grating under the overhead sheaves.
11. Painting, except elevator material.
12. In connection with passenger elevators:
 - a. Trough for concealment of traveling cable.
 - b. Facing to cover the counterweight area.
 - c. Exterior facing or treatment of the front hoistway walls.
 - d. Grouting of hoistway sills after installation.
 - e. Special painting of the hoistway side of hoistway entrance equipment.
 - f. Carpet in cabs.

14A-02 MANUFACTURERS

Materials and equipment for elevator work under this section shall be as manufactured by Otis Elevator Company, Westinghouse Electric Company-Elevator Division, or Haughton Elevator Company.

14A-03 PASSENGER ELEVATORS NUMBERED 1, 2, 3, 4, AND 5

Number	Five
Type	Passenger, Glass
Load and Speed	3500 pounds at 700 feet per minute.
Travel	From Carriage Level to Sky Bar, inclusive: none stop at 3rd Floor; only one stops at Mezzanine.
Stops and Openings	Per Architectural drawings.
Power Supply	3 Phase, 480 volts, 60 cycle, alternating current.
Control	Variable voltage with two directional leveling.
Operation	Otis VIP-260 group operation with independent service.
Platform	Per Architectural drawings.
Car Enclosure	\$30,000.00 allowance for each car.
Safety and Buffers	Gradual safety and oil buffers.
Door Operator	Direct current master electric operator for each car and hoistway door.
Hoistway Doors	Center opening, 3'-6" x 7'-0" clear.
Signals	Hall lanterns and illuminated car and hall buttons. Car position indicators in cab. Hall position indicator located at Service Level as directed.

14A-03 Maintenance

12 months following completion of project.

Additional Features

Telephone cabinets, and traveling cables, timed door protection with light rays and safety shoes. Trim and exposed metal of cab to be oxidized bronze. HVAC system as required to provide temperature range of 65 degrees to 80 degrees included in cab allowance.

Counterweights

No counterweight safety - counterweight shafts will be provided down to mat foundation.

14A-04 PASSENGER ELEVATOR EQUIPMENT

A. Machine Room Equipment:

1. Galvanized hoist ropes for moisture protection.
2. Specially hardened machine driver sheaves for use with galvanized hoist ropes.
3. Special water spray guards so that any water which may be on the hoist ropes will not be sprayed around the machine room.
4. A special type of hoist rope compensation to eliminate unsightly compensating ropes or chains.

B. Hoistway Entrances:

1. Extruded aluminum sills for all openings.
2. Standard width fascia plates between openings.
3. Full weatherstripping of all hoistway entrances including drip covers, weep holes in the sills, and weatherstripping of door panels.
4. Weatherproofing for the light ray door protection devices.

5. All hoistway entrances are standard center opening 3'-6" wide x 7'-0" high steel panels and frames with standard baked enamel finish on corridor side. Hoistway entrance frames designed for a maximum wall thickness of 8".
6. Special door hangers and door hanger track suitable for exterior use.
7. Full width hanger covers for door hanger and door track protection.

C. Hoistway Equipment:

1. Special corrosion resistant and protective paint on all exposed equipment.
2. Cadmium plated car safety parts with stainless steel pins.
3. Moistureproofing on all exposed electrical equipment.
4. Roller guides with extra width tires to maintain clean surface on car guide rails for possible safety application.
5. Special car frame buffer strike block extensions for the cars.
6. Specially built flexible traveling cable to provide the small loop required to allow for concealment of the cable.

14A-05 SERVICE ELEVATORS, NOS. 1, 2, AND 3

Number	Three
Type	Hotel Service
Load and Speed	3500 pounds at 700 feet per minute.
Travel	Service Level to Sky bar; rear opening at Service Level.

Stops and Openings	Per Architectural drawings.
Power Supply	480 volts, 3 phase, 60 cycle, alternating current.
Control	Variable voltage with two directional leveling.
Operation	Group automatic operation.
Machine	Gearless Traction, located overhead.
Platform	5'-2" wide x 8'-11" front to back.
Car Enclosures	\$5,000.00 allowance.
Safety and Buffers	Gradual safety and oil buffers. Counterweight safeties on all cars.
Door Operator	Direct current master electric operator for each car and hoistway door.
Hoistway Doors	Two-speed, center opening, 4'-0" x 7'-0". Steel panels and frames with standard baked enamel finish.
Sills	Extruded aluminum for all openings.
Signals	Manufacturer's standard: Car position indicator in cab, Hall lanterns, Hall position indicator located at Service Level as directed.
Maintenance	12 months following completion of project.
Additional Features	Telephone cabinets, and traveling cables, light ray door protection.

14A-06 OPERATIONAL EQUIPMENT, OTIS VIP-260:

- A. Otis VIP-260 Group Supervisory System is a Total System concept utilizing computer and the latest electronic techniques to determine where and when the elevators should be directed to best serve traffic requirements. Provisions will be included in the supervisory system to handle the following basic types of traffic demand:

Incoming Traffic
Two Way Traffic
Outgoing Traffic

- B. The system is also flexible and will automatically adjust for heavy or light "surges" of traffic that occur on a localized basis during any of the above basic traffic demand conditions.
- C. The operation of the elevator group will embody the following features and traffic handling conditions:

1. Incoming Traffic:

When the demand for "up" service reaches a pre-determined level and, with an absence of traffic in the down direction, elevators will automatically be dispatched up from the main floor to operate only as high as necessary to answer registered calls and will be returned immediately to the main floor. Only the selected car will have its landing light illuminated.

Each elevator will include an automatic load weighing device. When an "up" traveling or "down" traveling car is nearly filled and the load weighing device has operated, landing calls will be by-passed by this car. Under these conditions, the second car, if not already in operation, will be immediately started in response to registered landing calls, even though such calls would not otherwise cause the starting of this car. Operation of the load weighing device will not affect the stopping of the car in answer to car button calls.

2. Two Way Traffic:

Floors served by the group will be electrically separated into several zones and at least one car assigned to each zone. The lobby floor together with any basements, will form one zone, and the floors above will be divided approximately equally to form the other zones.

A car will be parked in each zone and will answer calls from floors in the zone. A car will travel only as high or as low as necessary to answer its calls, and upon completion of its calls, will then park with its doors closed in an unoccupied zone. Any car may be assigned to cover any zone.

A temporarily unoccupied zone will be served by the car in the adjacent zone below. A car passing through an occupied zone will be able to assist the car assigned to that zone.

Expanded Lobby Zone will be furnished. This feature permits several floors above the lobby to be included in the lobby zone. To insure lobby coverage, once the lobby zone car has served its call it will return to the lobby floor for parking purposes. While operating in the expanded zone, the car will retain its status as the assigned lobby zone car. Zone preference service will time the hall calls at the lobby as well as the floors included in the expanded zone.

A hall call registered behind a car within its zone will be answered by a lower zone car after an adjustable predetermined time.

All hall calls in all zones will be timed. If potentially long wait calls occur, additional cars will be permitted to travel to the zone requiring additional service.

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3. Outgoing Traffic:

When the down traffic demand reaches a pre-determined level with an absence of up traffic, the elevators will be operated with immediate up dispatch from the main floor and travel only as high as the highest call before reversing. The elevators will remain at the lower dispatching terminal only for an adjustable minimum passenger transfer time and will be immediately dispatched up.

Hall calls will be zoned to prevent more than one car from responding to a higher call and to prevent unnecessary travel of following cars.

D. Additional Features:

1. Load Weighing Bypass - Operates at any time when a car is filled to a predetermined percentage of capacity to have that car by-pass additional hall calls until the capacity load in the car is reduced.
2. Load Weighing Dispatch - Operates to immediately dispatch any car, selected or unselected from the lower terminal in the event it is filled to a predetermined percentage of capacity.
3. Independent Service - A switch shall be provided in the car operating panel which allows that car to be removed from group service and operable in response to car calls only.
4. Dispatch Protection - The system shall automatically provide emergency dispatching in the event of failure of the primary dispatching means.
5. Delayed Car Protection - The system shall automatically operate to disassociate a car from group service in the event that car is delayed for a predetermined time. Such car shall be automatically restored to group service when the delay is corrected.

6. Hall Button Protection - Operates to establish a predetermined pattern of hall stopping for the group of elevators in the event the hall buttons fail to operate for any reason. The group of cars will stop so half the cars serve odd floors and half even floors.
7. Separate Car Stop and Hall Stop Door Hold Open Times - Provides separate adjustments for the time the doors remain open in response to a hall stop or car stop. Matches passenger action with elevator stopping time, in that it takes much less time for a passenger to exit than to enter a car. Can match the time the doors remain open to the expected waiting time of passengers at a floor.
8. Directional Reversal - Provides operation so that hall lantern shown and car direction always correspond. Will cause a car stopping at a floor where both up and down hall buttons are touched to show a lantern in one direction, open its doors, wait for a short time, and if no call is registered in that direction, it will close its doors, re-open them and show a lantern in the opposite direction. Assures passengers cars can leave floor in direction lantern shows. Avoids traveling one floor higher to reverse a car.
9. Fan and Light Protection - Operates with an independent power supply for car lights and fan to turn light and fan power off and on with normal starting and stopping of motor generator and to maintain power on if generator shuts down for abnormal reason.
10. Car Parking Recognition - Operates to cause an elevator to park at a designated floor or in a designated zone without opening its doors (and disturbing tenants) if no car or hall call for that floor is registered. Car will open its doors if the car or hall button for that floor has been registered.
11. Anti-Nuisance Service - All car calls will automatically be cancelled in the event that the number of calls exceeds a proportional load in the car.

14A-07 SHOP DRAWINGS AND SAMPLES

Submit shop drawings and design detail drawings, brochures and illustrations in accordance with Section 1D.

- END -

SECTION 14B

ESCALATORS

Requirements of Division 1 apply to work of this Section.

14B-01 SCOPE

A. Required: All labor, materials, plant, equipment and facilities necessary for the fabrication, delivery and installation of all Escalators complete, as shown on drawings and/or specified herein, including but not limited to the following:

1. Escalators.
2. Miscellaneous accessories required for complete installations, ready for operation.

14B-02 MANUFACTURERS

Materials and equipment for elevator work under this section shall be as manufactured by Otis Elevator Company, Westinghouse Electric Company--Elevator Division, or Haughton Elevator Company. Escalators described herein are as made by Otis Elevator Company to establish types, materials and quality required.

14B-03 ESCALATORS

Furnish and erect in place following escalators, complete and operable in all respects.

A. Two type 32-R Glass Escalators:

- | | |
|-------------------|--|
| 1. Load and Speed | 5000 persons per hour at 90 feet per minute. |
| 2. Travel | Carriage Level to Mezzanine (ie, Coffee Shop to Post Street) |
| 3. Power Supply | 480 volts, 3 phase, 60 cycle, alternating current. |
| 4. Control | Alternating current resistance. |
| 5. Operation | Reversible. |

- | | | |
|----|---------------------|---|
| 6. | Machine | Geared, located at upper end. |
| 7. | Maintenance | 12 months following completion of project. |
| 8. | Additional Features | Laminated glass panels, oxidized bronze decks and trim, cleated risers and black handrails, porcelain skirts. |
- B. Two type 32-R Escal-Aires (glass) escalators to Mural Room:
- | | | |
|----|---------------------|---|
| 1. | Load and Speed | 5000 persons per hour at 90 feet per minute. |
| 2. | Travel | Carriage Level to Mezzanine (ie, existing Lobby to Lobby south of Mural/California Room.) |
| 3. | Power Supply | 480 volts, 3 phase, 60 cycle, Alternating current. |
| 4. | Control | Alternating current resistance. |
| 5. | Operation | Reversible. |
| 6. | Machine | Geared, located at upper end. |
| 7. | Maintenance | 12 months following completion of project. |
| 8. | Additional Features | Laminated glass panels, oxidized bronze decks and trim, cleated risers and black handrails, porcelain skirts. |

- , END -

SECTION 14C

PNEUMATIC TUBE SYSTEM

Requirements of Division 1 apply to work of this Section.

14C-01 SCOPE

- A. Provide pneumatic tube system, complete and operable in all respects, as indicated and specified. System shall be complete with following items and other accessories and appurtenances required to provide pneumatic tube complete and operable for Owner's use.
- B. The system furnished under these specifications shall be the standard product of the supplier and shall be equal in every respect to the Pneumatic Tube System as supplied by AREO CONVEYING SYSTEMS, San Francisco.

14C-02 GENERAL

The system shall be 2-1/4" O.D. (constant running) (vacuum) pneumatic tube, arranged on the principle of (twin tube) & (back aired) service.

- A. Power Unit - Power shall be supplied to the system by (2) (exhausters) connected to the system as indicated on the drawing and specified herein, which are the minimum requirements of the system.
- B. The location of the Eleven initial stations, as shown on the applicable drawings, shall be as follows:

Sta. #1	Skybar Res. Cashier	Cage
" 2	Skybar Lounge	" "
" 3	Coffee Shop	Cashier
" 4	Picadilly Rm.	" "
" 5	Terrace	" "
" 6	Grill	" "
" 7	Room Service	1
" 8	" "	2
" 9	Tel. Operator	13
" 10	Valet Shop	
" 11	Housekeeping	

- C. Submit shop drawings per requirements of "Supplementary General Conditions". Shop drawings shall include, but not be limited to, sub-station details, tube layout, diagrammatic air circuits, air exhauster arrangements and field measurements determining exact location and requirements of all equipment furnished under this work.

14C-03

LINE FITTINGS

- A. Tubing - Tubing shall be 2-1/4" O.D. #20 gauge cold rolled electric welded galvanized steel, specially manufactured for pneumatic tube work with one end belled. Ends shall be cut square, filed smooth, and free from burs or other projections. Joints between sections shall be made with either sleeve couplings or bell-end tubing.
- B. Bends - Tube bends shall be made of the same material as above, formed to a center line radius of 24" to accommodate carriers of the size specified.
- C. Hangers and Supports - Hangers shall be spaced not more than 12 feet on centers. Hangers for one or two lines of tubing shall be 1/4" rods attached to separators. Hangers for three or more lines shall be formed with row clamps or 1-1/2" channels laid flat against the bottom of the tubing and supported by not less than two rods spaced not over 3 feet apart. Support rods shall be 1/4" where tubing is less than 4" and 3/8" for 4" or larger tubing. Supports for vertical runs of tubing shall be of a clamp type supported on channels or rods at each floor level.
- D. Clean-Outs - A screen clean-out shall be installed on each return line in an accessible location at each turbo. Screens shall be contained in a cast-aluminum housing with milled connections for tubing and shall have an airtight access door. Screening shall be 3 by 3 mesh galvanized hardware cloth having a wire diameter of not less than 0.072 inch. Where indicated, a screen clean-out shall be provided at the blower where a large manifold drum is used.
- E. Rotary Windgate - Each air circuit shall have installed a rotary type, positive set-screw, windgate to control the flow of air.

- F. Fittings - Fittings shall be cast iron or cast aluminum with the inside milled to fit snugly on the tubing. The Contractor shall provide all necessary box connectors, close elbows, tees, coupling sleeves, and other fittings required for proper installation of the system.

14C-04

STATION EQUIPMENT

Station equipment shall be recessed wall, pedestal mounted, or free standing type, in accordance with requirements or conditions shown on drawings, and as directed by Designer.

- A. Recessed Wall - Terminals shall be built into the wall where indicated and shall have a finish frame to be installed after completion of finish plaster work.
- B. Pedestal Mounted - Terminals shall be installed on pedestals constructed of 0.0598 inches in thickness (No. 16 M.S.G.) corrosion resisting steel. Where free delivery terminals are used a pocket or canvas sling shall be constructed into the pedestal. All units shall have carrier storage pockets.
- C. Free Standing Type Station - Terminals shall be mounted on the walls, desks, shelves or other locations that may be indicated or supplied by others.

14C-05

TERMINAL EQUIPMENT:

- A. Down Discharge - Each down discharge station shall be equipped with a bypass set in the tube above the terminal, where the air shall be bypassed to the sending inlet for this station or to air supply from power unit. The terminal shall be constructed of stretcher-leveled furniture steel, 0.0897 inch in nominal thickness (No. 13 Manufacturers' Standard Gauge) welded airtight or cast aluminum with (single valve) (double valve) bypass arrangement.
- B. Down Delivery Air Cushion at Stations 1, 2, 5, 10, and 11: Receiving box shall be constructed of #12 gauge furniture steel. Door to be of plastic mounted on a cast iron frame, opening right or left hand to meet field conditions. The receiving terminal shall be fitted with an air bypass fitting at a suitable height above the terminal. The terminal below the bypass shall then set as a closed cylinder causing the incoming carriers to compress the air in this chamber and retard the momentum of the carrier.

- C. Up Delivery Free Discharge at "Central" shall consist of cast aluminum short radius 180° turn, delivering through spring loaded leather valve. Inside of casting shall be smooth and free from burs. Air bypass shall be connected to a return send line or to air supply from power unit.
- D. Up Delivery Enclosed at Stations 3, 4, 6, 7, 8, and 9 shall consist of a closed delivery, retaining the carrier inside the terminal, easily visible through a transparent plastic door, with spring loaded hinge.

14C-06 CARRIERS

- A. This Contractor shall provide a total of 50 carriers with the system. These carriers will have an inside length of 5-1/2" and an inside diameter of 1-3/8". They will be equipped with plastic body material, and shall have felt head and floating rubber air disc. The other end shall be closed with rubber cover and clasp and ride on top grained cow hide leather skirt.

14C-07 POWER UNITS

- A. Centrifugal - Centrifugal multi-stage exhauster capable of operating all stations at one time. The unit shall be Spencer Turbine Cat. No. 1001-1/2 at Skybar and Cat. No. 1007 at Central Desk, direct connect extended shaft motor operating at 3500 RPM at Skybar and 1750 RPM at Central Desk. Units shall produce 160 CFM at Skybar and 2000 CFM at Central Desk at 16 ounces constant pressure producing a smooth flow of air and an average carrier speed of 30 FPS.
- B. Attachments - Power unit shall be equipped with the following equipment:
 - 1. Cork mounting pads 2" thick.
 - 2. Blastgate.
 - 3. Flexible rubber connectors.

14C-08 MOTORS & CONTROLS

- A. Motors shall be standard open dripproof type rated at 1-1/2 HP at Skybar and 7-1/2 HP at Central Desk, operating on 480 volts 3 phase 6 cycles A.C. Motors shall be de-

signed for continuous operation in a 40° C. ambient temperature. Polyphase motors shall be squirrel-cage type having normal-starting-torque and low-starting-current characteristics.

- B. Controls - Each motor shall be furnished with a starter conforming to Underwriters Laboratories, Inc., Standard for Industrial Control Equipment and to the adopted and recommended standards of the NEMA Industrial Control Standards. Starters shall be of the enclosed across-the-line type except as hereinafter specified. Starters shall be provided with manual-reset thermal overload protection.

14C-09 INTAKE & MUFFLERS

- A. The intake air supply line shall be 12" in diameter, constructed of sheetmetal No. 18 gauge fitted with a screen clean-out at the exhaust. Hangers of rod or strap iron shall be used to hold air pipes in proper position.

14C-10 INSTALLATION

- A. All installation will be made by journeyman mechanics trained in pneumatic tube installations.
- B. Exposed tubing shall be run as directed between stations and shall be hung level and plumb.

14C-11 WORK SPECIFIED UNDER OTHER SECTIONS

- A. Exhauster, station equipment, fittings shall be given a standard coat of paint before shipment. Any additional painting of equipment shall be by others.
- B. Access panels supplied by pneumatic tube Contractor, installed by applicable trade.
- C. Placement of sleeves in floors and walls.
- D. Cutting and patching of walls, ceilings, cabinets.
- E. Enclosures of recessed stations.
- F. Supporting platforms for power units, etc.

- G. Electric power source and electric wiring of motors and controls. Pneumatic tube Contractor to furnish only electrical equipment as herein specified.

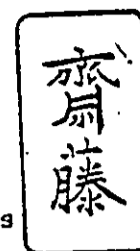
14C-12

GUARANTEE & TEST

Contractor shall guarantee the successful operation of the system. After completion, he shall conduct a performance test in the presence of the Owner and his maintenance personnel. The maintenance personnel shall be properly trained for the general maintenance of the system by the Contractor's supervisor. Contractor shall repair or replace any defective parts due to poor workmanship, or design, for a period of one year. Ordinary wear and tear, particularly on carriers, shall be excluded from this guarantee.

- END -

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Consulting Engineer



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PROPOSAL

In compliance with the Instructions to Bidders the undersigned hereby proposes to furnish all labor, materials, plant and equipment, etc., and to perform all work for the project described as TOWN HOUSE UNITS FOR NEW WORLD INVESTMENT in strict accordance with the specifications, drawings and/or schedules and Addenda Nos.

\$ _____ for
_____ Dollars.

The Bid shall hereby be termed the "Basic Bid" and which amount includes an allowance for all permit fees, taxes and insurance required and applicable, and agrees upon notice of an award of the Contract within twenty (20) calendar days after the submission of this Bid, to execute a Contract as prepared by the Designer for Construction of a Building in accordance with this Bid as accepted, and will furnish Surety Bond which shall, among other things, hold good for a period of one (1) year from and after completion and acceptance of the work, in the full amount of the Contract guaranteeing the faithful performance of the Contract, and the payment of all lawful wages of workmen and all claims of material suppliers and sub-contractors engaged on the work, with a Surety Company acceptable to the Owner.

The premium for the Surety Bond will be paid by the Contractor, and the cost thereof shall be included in this Bid.

The undersigned further agrees to supply all materials and labor and equipment to complete all the work in the manner required in no more than:

two hundred ten (210) calendar days and failing to do so, agrees to forfeit to the Owner as Liquidated Damages for non-completion of the work, the sum of:

\$100.00 per Calendar Day

and every day that the work may remain uncompleted and unaccepted beyond the Completion date so established above.

The Owner reserves the right to reject any bid.

INSTRUCTIONS TO BIDDERS

INSTRUCTIONS FOR GENERAL CONTRACT BID:

Bids will be received for furnishing all labor, materials, equipment, transportation, permits, prevailing taxes, insurance required and applicable, (except such work or materials expressly reserved herein or in specifications to be performed or furnished by others) in strict accordance with the drawings and specifications.

Deliver sealed bids by 2:00 p.m., Thursday, ~~SEPTEMBER 8~~ ^{OCTOBER 4} 1977
to ~~Oda/McCarty, Architects 580 Laukapu Street, Hilo, HI~~
~~MIDPAC DESIGN ASSOCIATES, 648 MANALO AVE, SUITE 6, MANALO PARK,~~

In the event a Bidder proposes to substitute any materials or equipment for those specified or shown on drawings, he shall attach to his bid a signed and dated list of such substitutions together with cost additions or deductions from his Basic Bid. Suggested substitutions will be evaluated by the **Designer** who will submit them to Owner for a final decision.

Bidders shall carefully examine the specifications and drawings and satisfy themselves as to their sufficiency. Bidders are to visit and inspect site of proposed construction and to familiarize themselves with all conditions which would in any way affect the work or cost thereof. Submission of bid will constitute an admission of knowledge by the Bidder of familiarity with conditions at building site. Should a Bidder find any discrepancies in or omissions from specifications or drawings, or should he be in any doubt as to their meaning, he shall at once notify the **Designer** and obtain from him a decision or interpretation of the matter in question. No deviation from plans and specifications will be permitted without written consent of the **Designer**. Bidder must direct all his queries and suggestions to the **Designer** he must not disturb representatives of the Owner.

The Owner reserves the right to reject any bid.

SECTION 1A. GENERAL CONDITIONS

1. GENERAL:

"General Conditions of the Contract for Construction", standard form #A201 of the American Institute of Architects, latest Edition, insofar as the Designer judges them applicable are hereby made a part of these specifications.

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ROOM MATERIAL CODE LIST

FLOOR/BASE		WALL/WAINSCOT		CEILING	
A	CONCRETE FLOOR VINYL BASE @ GYP. BD. WALLS ONLY WHERE OCCURS	1	CONCRETE	A	CONCRETE
B	CONCRETE WITH NON-SLIP GRIT FINISH NO BASE	2	C.M.U.	B	CEMENT PLASTER
C	CERAMIC TILE FLOOR CERAMIC TILE BASE INTEGRAL WITH WALL TILE	3	CEMENT PLASTER	C	GYPSUM PLASTER
D	QUARRY TILE FLOOR QUARRY TILE BASE	4	GYPSUM PLASTER	D	ACOUSTIC PLASTER
E	WOOD FLOORING WOOD BASE	5	VINYL WALLCOVERING (NIC) OVER CONCRETE, PLASTER, OR GYPSUM BD. AS OCCURS	E	CONCRETE CEMENT PLASTER
F	V.A.T. FLOORING VINYL BASE	6	GYPSUM BOARD VINYL WALLCOVERING (NIC) OVER ONE LONG WALL OF GYPSUM BOARD.	F	GYPSUM BOARD
G	SHEET VINYL FLOORING VINYL BASE	7	CONCRETE GYPSUM BOARD	G	ACOUSTICAL TILE 'Z' GRID
H	CARPET FLOORING (NIC) ON CONCRETE FLOOR WOOD BASE	8	CONCRETE W/R GYPSUM BOARD	H	ACOUSTICAL TILE 'T' GRID
J	CARPET FLOORING (NIC) ON CONCRETE FLOOR CARPET BASE (NIC)	9	CONCRETE CEMENT PLASTER	J	VINYL FACE ACOUSTICAL TILE 'T' GRID
K	WOOD FLOORING CARPET FLOORING WOOD BASE	10	CERAMIC TILE OVER WATER RESISTANT GYPSUM BOARD	K	ARCHITECTURAL WOODWORK OVER GYPSUM BOARD

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Consulting Engineer

ROOM MATERIAL CODE LIST, CONT.

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L	CERAMIC TILE FLOOR 4" H. CEMENT TILE BASE	11	CERAMIC TILE OVER CEMENT PLASTER	L	WOOD STRUCTURE
M		12	ARCHITECTURAL WOODWORK OVER CONCRETE, C.M.U. GYPSUM BOARD, OR PLASTER AS OCCURS	M	CONCRETE WITH FURRED AREAS OF GYP. BD. AS REQUIRED FOR UTILITIES
N		13	ARCH. WOODWORK OVER CMU AND GYP. BD. VINYL WALL- COVER (NIC) OVER ONE LONG WALL OF GYP. BD.	N	
P		14	GYPSUM BOARD	P	
Q		15	GYPSUM BOARD WITH W/R GYPSUM BOARD @ TUB @ TOILET WALLS	Q	
R		16	CONCRETE CMU GYPSUM BOARD	R	
S		17	CONCRETE CMU	S	
T		18	CMU GYPSUM BOARD	T	
U		19	CONCRETE CMU CEMENT PLASTER	U	
V		20		V	

REMARKS:

17 CABINETS TO BE ARCHITECTURAL WOODWORK.

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Consulting Engineer

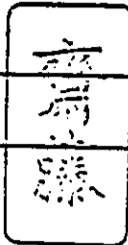
ROOM FINISH SCHEDULE



Mark Saito
Consulting Engineer

FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		FERTILIZER STOR.	A		17		A			
		MAIN KITCHEN	D		19	EPOXY PAINT	J			
		FOOD & BEVERAGE STOR.	A		19	EPOXY PAINT	J			
		FOOD STORAGE								
		BEVERAGE STORAGE								
		SPECIAL STORAGE								
		CONTROL	D		19	PAINT	J			
		CHEF	D		19	PAINT	J			
		STEWART	D		19	PAINT	J			
		ROOM SERVICE	D		19	EPOXY PAINT	J			
		ROOM SERVICE OFFICE	D		19	PAINT	J			
		COMPRESSOR ROOM	A		18	PAINT	A	PAINT		
		COFFEE SHOP	H		12		K			<i>Plank finish concrete, painted</i>
		SPECIALTY RESTAURANT	H		12		K			<i>Plywood hanging frames</i>
		NITE CLUB	K		12		K			
		PUBLIC MEN'S	C		11		F	PAINT		
		PUBLIC WOMEN'S	C		11		F	PAINT		
		MAIN DINING	H		12		K			<i>Textured Plaster, scored concrete columns</i>

ROOM FINISH SCHEDULE



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FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL/WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		SPORTING GOODS	A		7		A			
		MALL	H		6		D			
		DRUGSTORE	A		7		A			
		GEN. STORE LIQUORS	A		7		A			
		NEWS - TABACCO	E		12		K			
		<i>Color concrete plank floor w/ 2x4 islands</i> MAIN LOBBY	H		12		K			<i>lath & plaster - scored - painted.</i>
		REGISTRATION & BELL BOY	H		6	PAINT	D			1
		BAGGAGE STOR.	H		14	PAINT	D			
		CREDIT MANAGER	H		6	PAINT	D			
		FRONT OFFICE MANAGER	H		6	PAINT	D			
		CASHIER	H		6	PAINT	D			
		HALLWAY	H		6	PAINT	D			
		WOMEN'S (PUBLIC)	C		10		F	PAINT		
		MEN'S (PUBLIC)	C		10		F	PAINT		
		BALLROOM	H		13		G			
		MEETING RM. PANTRY	A		7		G			
		BULK STORAGE	A		7		G			
		MEETING ROOMS	H		13		G			
		GALLERY	H		12		K			

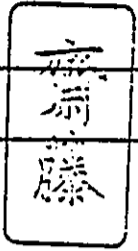
ROOM FINISH SCHEDULE



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Consulting Engineer

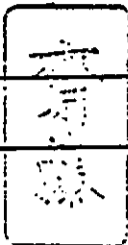
FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		LOBBY LANAI	B		9	PAINT	--			
		JR. DEPT. STORE	A		7		A			
		COMMERCIAL SHOPS	A		6	PAINT	D			
		BALLROOM PROJ. BOOTH	A		7	PAINT	A			

ROOM FINISH SCHEDULE



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Consulting Engineer

FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		GENERAL MANAGER	J		6	PAINT	D			
		RESIDENT MANAGER	J		6	PAINT	D			
		SALES MANAGER	J		6	PAINT	D			
		FOOD & BEVERAGE MGR.	J		6	PAINT	D			
		BANQUET MANAGER	J		6	PAINT	D			
		ACCOUNTING MANAGER	J		6	PAINT	D			
		COMPROLLER	J		6	PAINT	D			
		GENERAL ACCTG. AREA	J		6	PAINT	D			
		SECRETARIES & FILES	J		6	PAINT	D			
		DR. WAITING ROOM	J		6	PAINT	D			
		DOCTOR'S ROOM	J		5		D			



Mark Saito
Consulting Engineer

ROOM FINISH SCHEDULE										
FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
MISCELLANEOUS BUILDING		POWER GENERATION & COOLING TOWER								
		LUAU STORAGE	A		2		L			
		TOILET RM. BLDG. MEN & WOMEN	A		2	EPOXY PAINT	L			
		LAGOON COTTAGES	H		1	PAINT	A	PAINT		
		BATHROOMS	L		15	PAINT	A	PAINT		
		LANAIS	B		1	PAINT	A	PAINT		

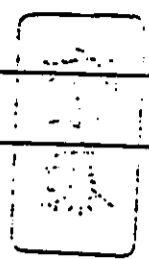
ROOM FINISH SCHEDULE



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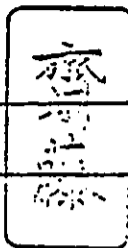
FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
GUEST ROOM WINGS - ALL FLOORS		GUEST ROOMS	H		7	texture skip coat PAINT	A	sim. acc. spray w/ color tone		ESP on Aluminum
		BATHROOMS	H L	GC: Full length	15	MIRROR PAINT	Vanity	WC: PAINT Grin Patch PAINT		CORIAN or CULT. MAR. for SINK & TUB
		LANAIS	B	hroom finish	8	PAINT	A	PAINT		Alum. railing, Bronze and 2" sec
		PUBLIC CORRIDORS	H	2 1/2" V. Base GC	6	CART RAIL / PAINT	VERT. BULL. GC: VINYL	PAINT	Nast w/c supply & install	
		EXIT STAIRS	B		1	PAINT	A	PAINT		
		ICE ROOM	G		5	PAINT	A	PAINT		
		JANITOR'S CLOSET	A		14	PAINT	A	PAINT		
		SERVICE	F		14	PAINT	A	PAINT		
		MAID'S ROOM	F		14	PAINT	A	PAINT		
		ELECT./TELEPHONE	A		14	PAINT	A	PAINT		
		ELECTRIC CLOSET	A		14	PAINT	A	PAINT		
		BULK STORAGE	F		7	PAINT	A	PAINT		

ROOM FINISH SCHEDULE



Mark Saito
Consulting Engineer

FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL/WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		ELEVATOR MACHINE ROOM	A		1		A			
		ALL MAINTENANCE AREAS	A		16		A			
		DAILY STORAGE								
		WELDING								
		CARPENTRY SHOP								
		PAINT STORAGE								
		T.V. REPAIR								
		KEYS								
		COMM. STOR.								
		PLBG. & ELEC. SHOP								
		GEN. MAINTAIN								
		LT. STOR.								
		MECHANICAL & ELECTRICAL	A		17		A			
		SWITCH GEAR								
		TRANSFORMERS								
		MECH. EQUIP.								
		TELEPHONE								
		CHIEF ENGINEER	F		16	PAINT	A	PAINT		



ROOM FINISH SCHEDULE

FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		SERVICE CORRIDORS	F		17	PAINT	A	PAINT		
		HEALTH CLUB & GYM	F		16	PAINT	D			
		MEN	C		11	PAINT	A	PAINT		
		WOMEN	C		11	PAINT	A	PAINT		
		GAME ROOM	F		17	PAINT	G			
		COIN LAUNDRY	F		17	PAINT	A	PAINT		
		BEAUTY SHOP	G		16	PAINT	D			
		BARBER SHOP	G		18	PAINT	D			
		MEN'S LOCKER & VEST.	L		16	PAINT	A	PAINT		
		MEN'S	C		11		A	PAINT		
		WOMEN'S LOCKERS & VEST.	L		18	PAINT	A	PAINT		
		WOMEN'S	C		11		A	PAINT		
		GENERAL BULK STORAGE	A		9		A			
		CHINA STORAGE	A		9		A			
		CLERICAL	F		14	PAINT	H			
		PERSONNEL MGR.	F		14	PAINT	H			
		RECEIVING	F		14	PAINT	H			
		PURCHASING	F		14	PAINT	H			
		RECEIVING DOCK	A		9	EPOXY PAINT	A	PAINT		

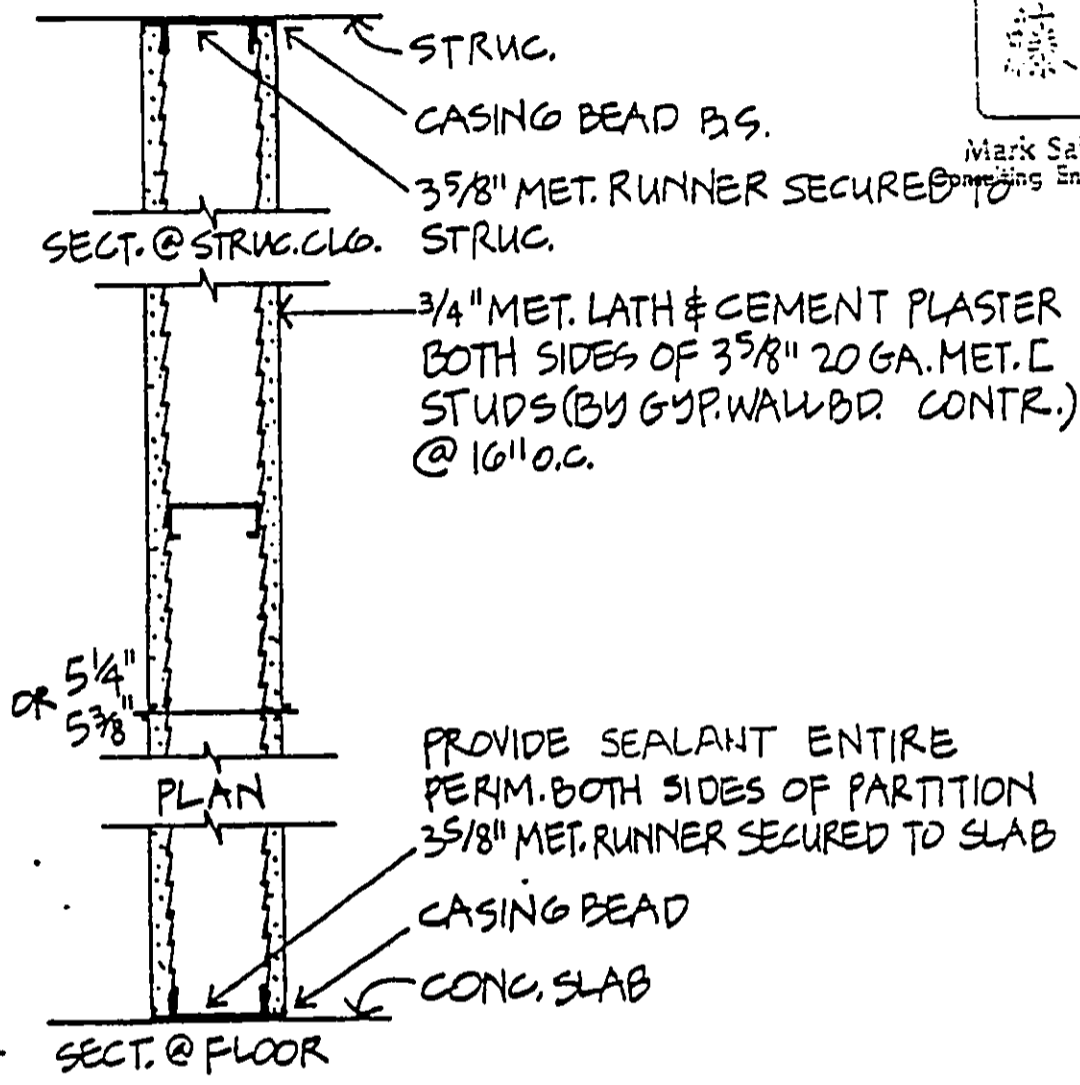
ROOM FINISH SCHEDULE

FLOOR NUMBER	ROOM NUMBER	ROOM NAME	FLOOR/BASE	FINISH	WALL / WAINSCOT	FINISH	CEILING	FINISH	CEILING HEIGHT	REMARKS
		EMPTY BOTTLES	A		3		A			
		DUMPSTER	A		9	EPOXY PAINT	A	EPOXY PAINT		
		GARAGE SORTING	A		9	EPOXY PAINT	A	EPOXY PAINT		
		REFRIG. GARBAGE	A		9	EPOXY PAINT	A	EPOXY PAINT		
		EMPLOYEE DINING	F		16	PAINT	H			
		FOOD PREP.	F		18	PAINT	J			
		ISSUE COUNTER	F		16	PAINT	A	PAINT		
		LINEN	A		16	PAINT	A	PAINT		
		UNIFORM STORAGE	A		7	PAINT	A	PAINT		
		HOUSEKEEPERS OFFICE	F		16	PAINT	A	PAINT		
		LOST & FOUND	A		14	PAINT	A	PAINT		
		ELECT. ROOM	A		18	PAINT	A			
		TIMEKEEPER	F		14	PAINT	A	PAINT		
		LAUNDRY	A		16	EPOXY PAINT	A	PAINT		
		LAUNDRY OFFICE	F		18	PAINT	A	PAINT		
		GROUNDS EQUIP. MAINT.	A		17		A			
		PARTS STOR.	A		17		A			
		TOOLS	A		17		A			
		NURSERY EQUIP.	A		17		A			

NOTE: MAX. HEIGHT = 17'-1" @ INTERIOR, FOR EXTERIOR USE VERIFY W/ WINDLOAD REQUIREMENTS

detail master

FILE NO. 9.100
2



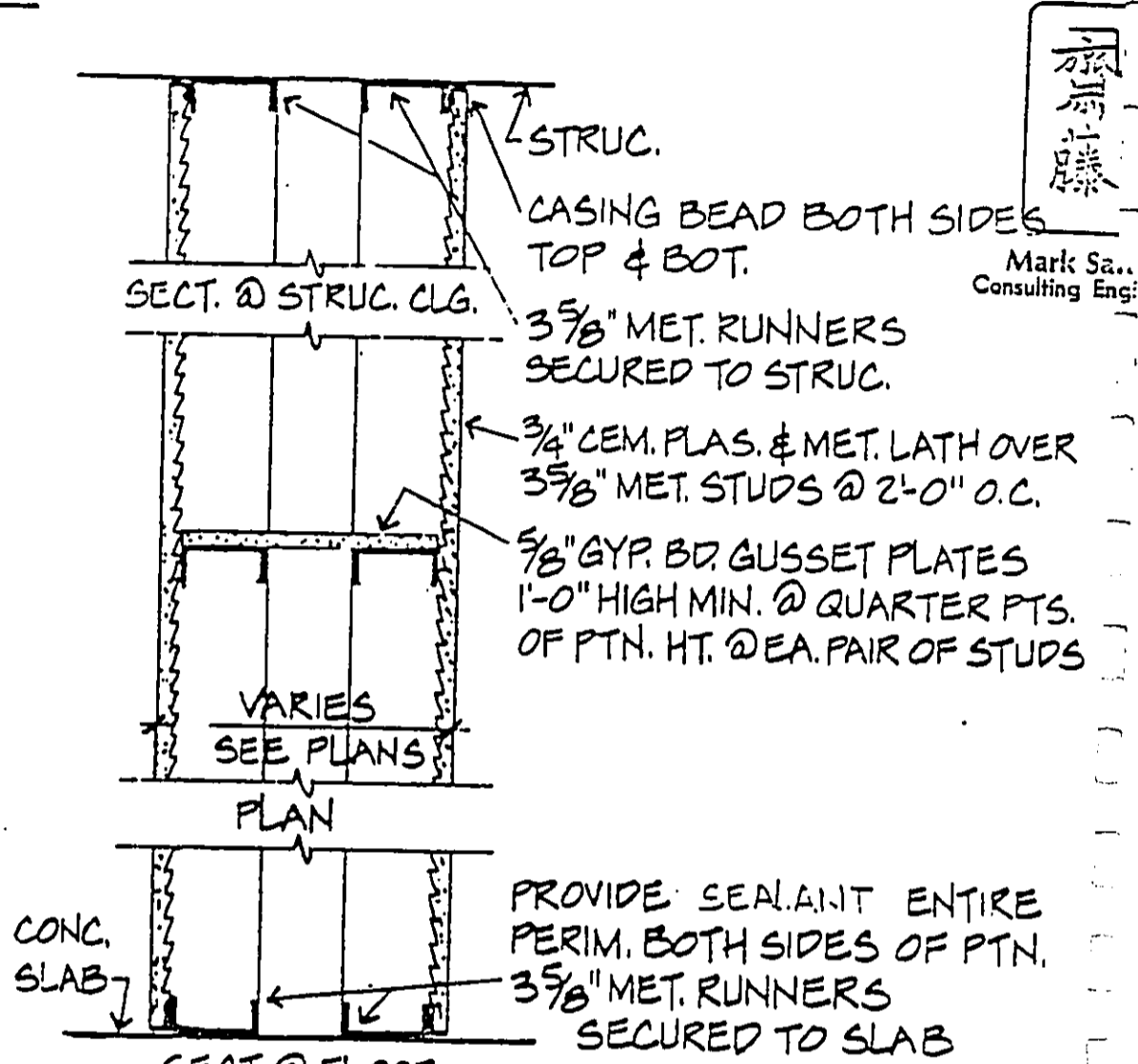
Mark Saito
Professional Engineer

3 U.B.C. ITEM #83
FIRE RATINGS
1 HR.

SPEC. REFERENCE LATH & PLASTER SEC. NO. 9.100
 PROJECT ORIGINALLY DRAWN FOR FILE
 DATE 4.20.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.100
 REV. _____ NO. 2
 COPY TO SPEC. DEPT. (DATE) _____ (LEAVE BLANK)

10'-3" MAX HEIGHT = 16'-6" @ 2'-0" STUD SPACING, 19'-0" @ 1'-4" STUD SPACING

FILE NO. 9.100
7



Mark Sa...
Consulting Eng.

detail master



U.S.G. CODE APPROVAL SELECTOR FIRE RATINGS
ITEM # 8 SIM. 1 HR.

SPEC. REFERENCE LATH & PLASTER SEC. NO. 9.100

PROJECT ORIGINALLY DRAWN FOR ARIZONA MEMORIAL S./F.

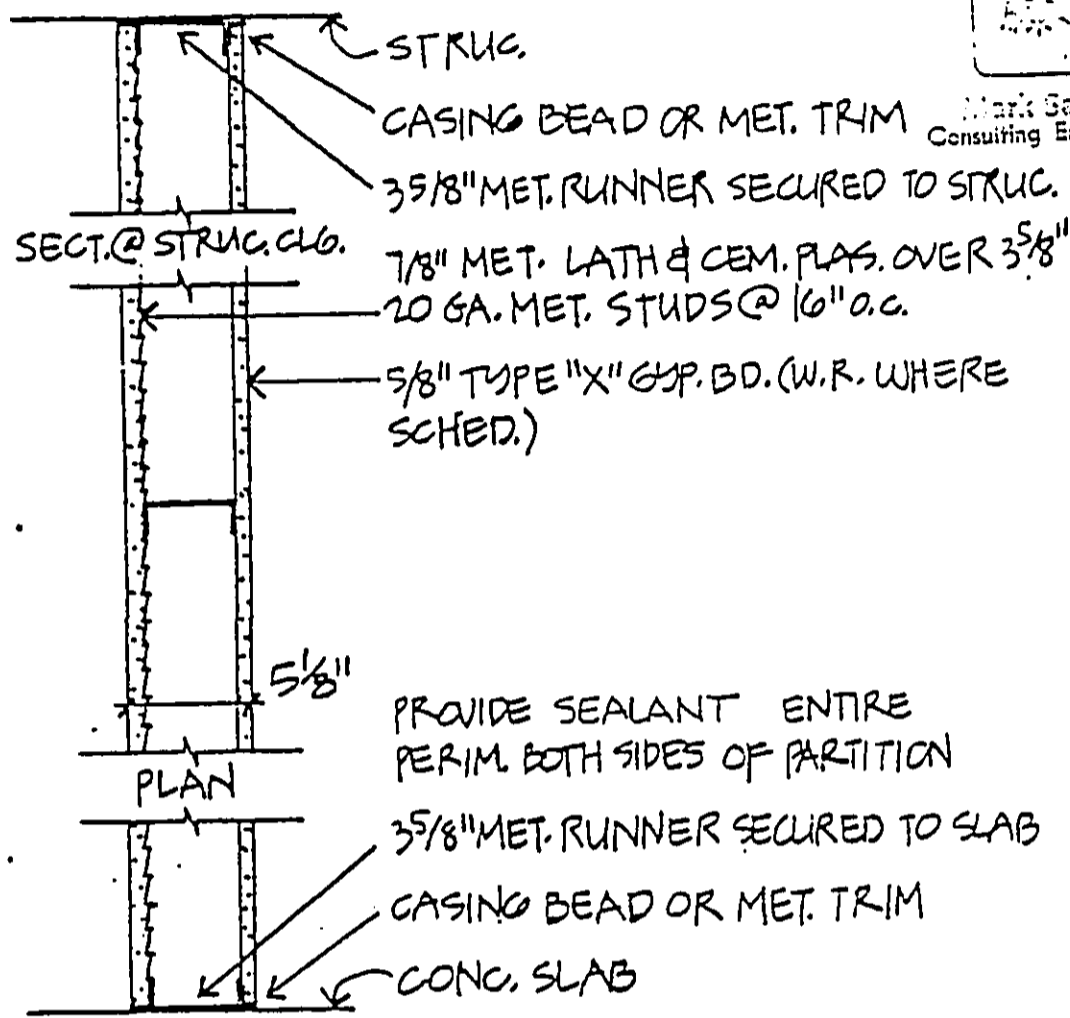
DATE 15 FEB 78 ORIGINAL FILE 9.100

REV. _____ SCALE 1/2" = 1'-0" NO. 7

COPY TO SPEC. DEPT. (DATE) _____ (LEAVE BLANK)

NOTE: MAX. HEIGHT = 17'-1" @ 16" STUD SPACING
 * CAUTION: HEIGHTS DO NOT APPLY TO CASES w/ DIFFERENTIAL AIR PRESSURES

FILE NO. 9.250
7



Mark Saito
 Consulting Engineer

SECT. @ FLOOR
 U.B.C. SOUND RATED: S.T.C. 53 w/ INSUL.
 U.S.G. CODE APPR. SEL. FIRE RATINGS
5 ITEM # 83 & ITEM # 6 1 HR.

detail master

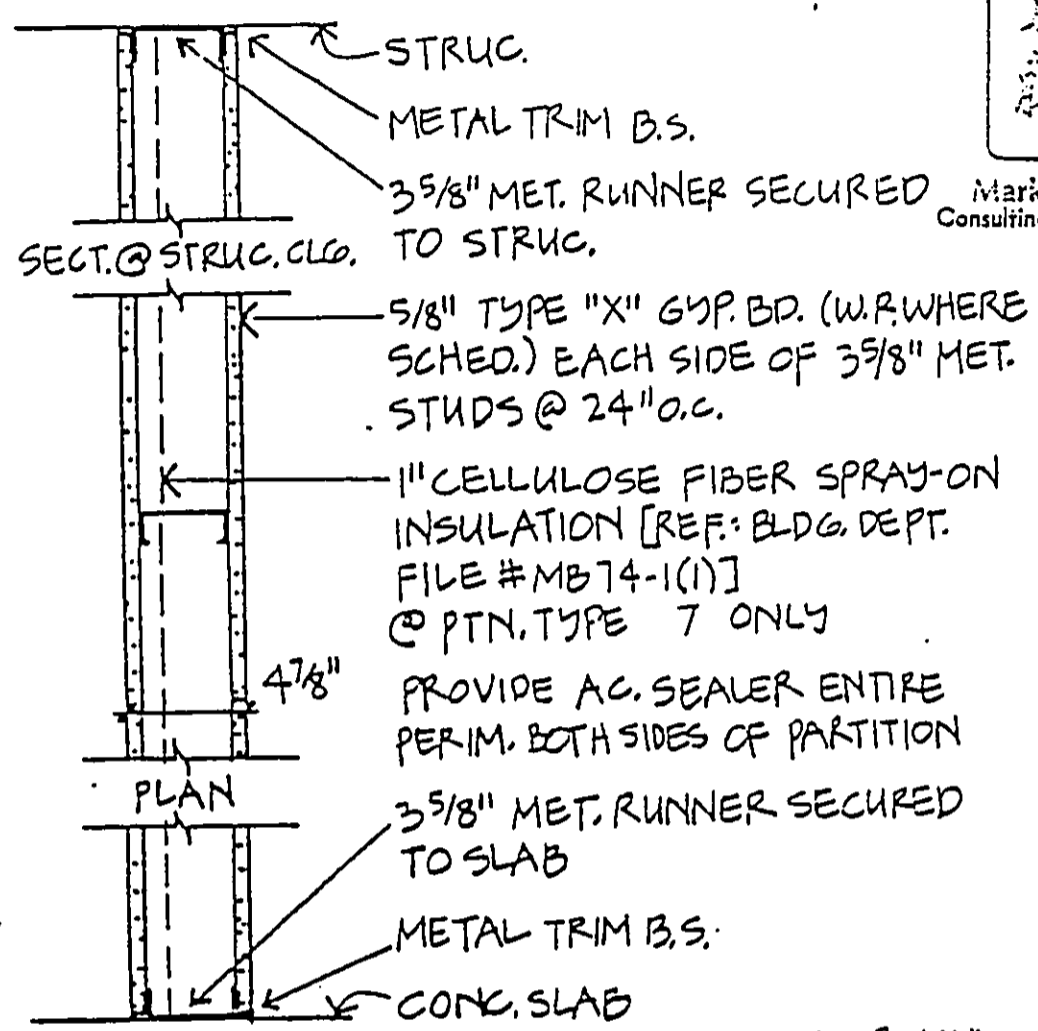
SPEC. REFERENCE GYPSUM WALLBOARD SEC. NO. 9.250
 PROJECT ORIGINALLY DRAWN FOR FILE
 DATE 4.20.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 7
 (LEAVE BLANK)
 COPY TO SPEC. DEPT. (DATE) _____

K-11/2 MOD. K-1 MOD.

NOTE: MAX. HEIGHT = 17'-3" @ 24" STUD SPACING, 19'-5" @ 16" STUD SPACING
 *CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

FILE NO. 9.250
4

detail master



Mark Saito
 Consulting Engineer

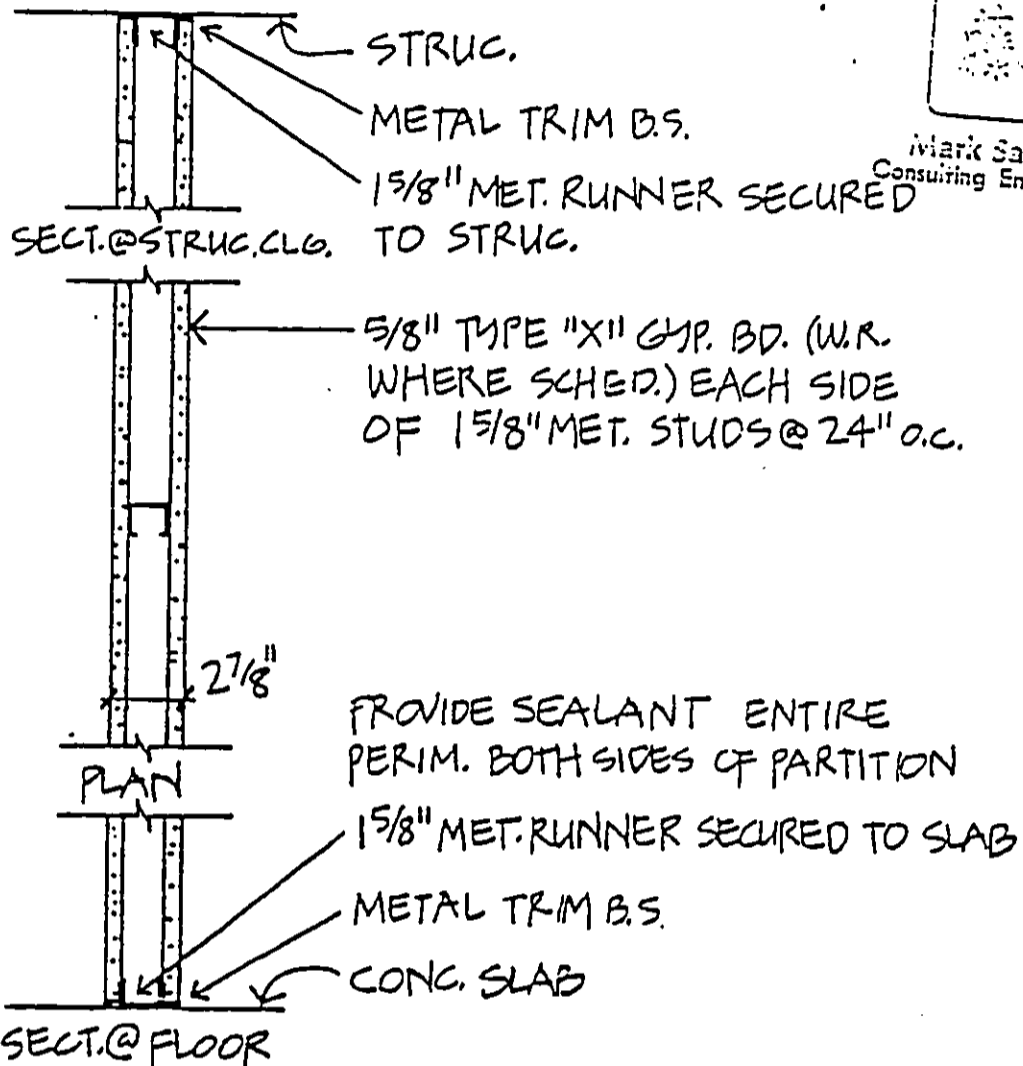
	U.S.G. CODE APPROVAL SELECTOR	FIRE RATINGS
6	ITEM # 6	1 HR.
7	SAME AS PTN. # 6 EXCEPT ADD INSULATION	1 HR.

SPEC. REFERENCE GYPSUM WALLBOARD SEC. NO. 9.250
 PROJECT ORIGINALLY DRAWN FOR FILE
 DATE 4.18.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 4
 (LEAVE BLANK)
 COPY TO SPEC. DEPT. (DATE) _____

NOTE: MAX. HEIGHT = 10'-0" @ 24" STUD SPACING, 11'-0" @ 16" STUD SPACING
 *CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

FILE NO. 9.250
4.2

detail master



Mark Saito
 Consulting Engineer

PROVIDE SEALANT ENTIRE PERIM. BOTH SIDES OF PARTITION

	U.S.G. CODE APPROVAL SELECTOR	FIRE RATINGS
8	ITEM #7	1 HR.
9	SAME AS PTN. #8 EXCEPT MET. STUDS @ 16" O.C.	1 HR.

SPEC. REFERENCE GYP SUM WALL BOARD SEC. NO. 9.250

PROJECT ORIGINALLY DRAWN FOR FILE

DATE 4.19.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 4.2

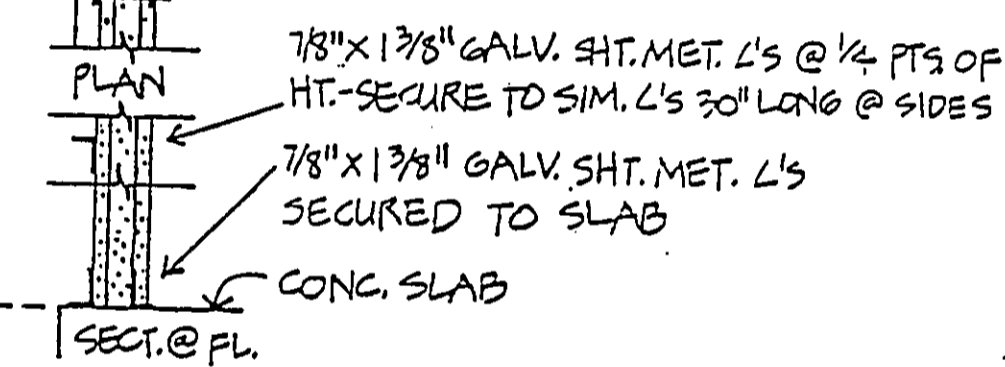
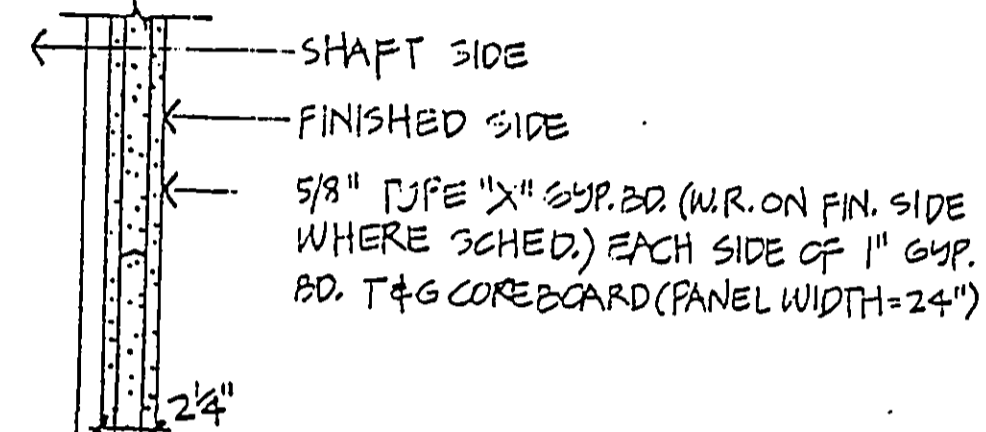
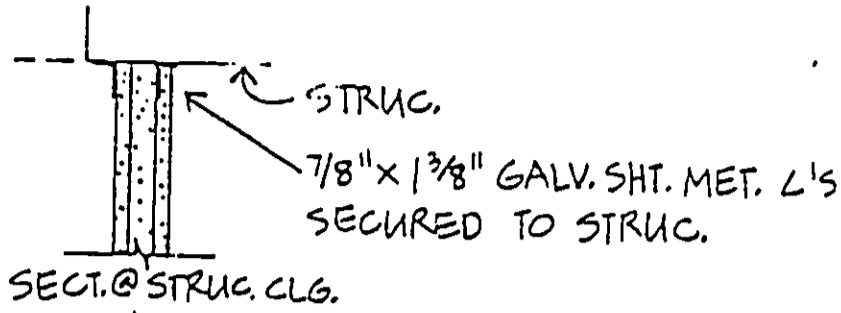
COPY TO SPEC. DEPT. (DATE) _____ (LEAVE BLANK)

NOTE: MAX. HEIGHT = 12'-0" FREE STANDING. CAN BE INCREASED WHERE SIDEWALL SUPPORTED @ MAX. WIDTH OF 4'-0"

*CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

detail master

FILE NO. 9.250



U.S.G. CODE APPROVAL SELECTOR

ITEM # 49

FIRE RATINGS

2 HR.



Mark Saito
Consulting Engineer

SPEC. REFERENCE GYP SUM WALLBOARD

SEC. NO. 9.250

PROJECT ORIGINALLY DRAWN FOR FILE

DATE 4.18.77

ORIGINAL

FILE 9.250

REV. _____

SCALE 1/2" = 1'-0"

NO. 1

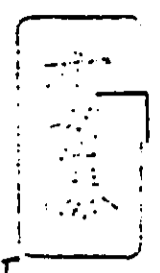
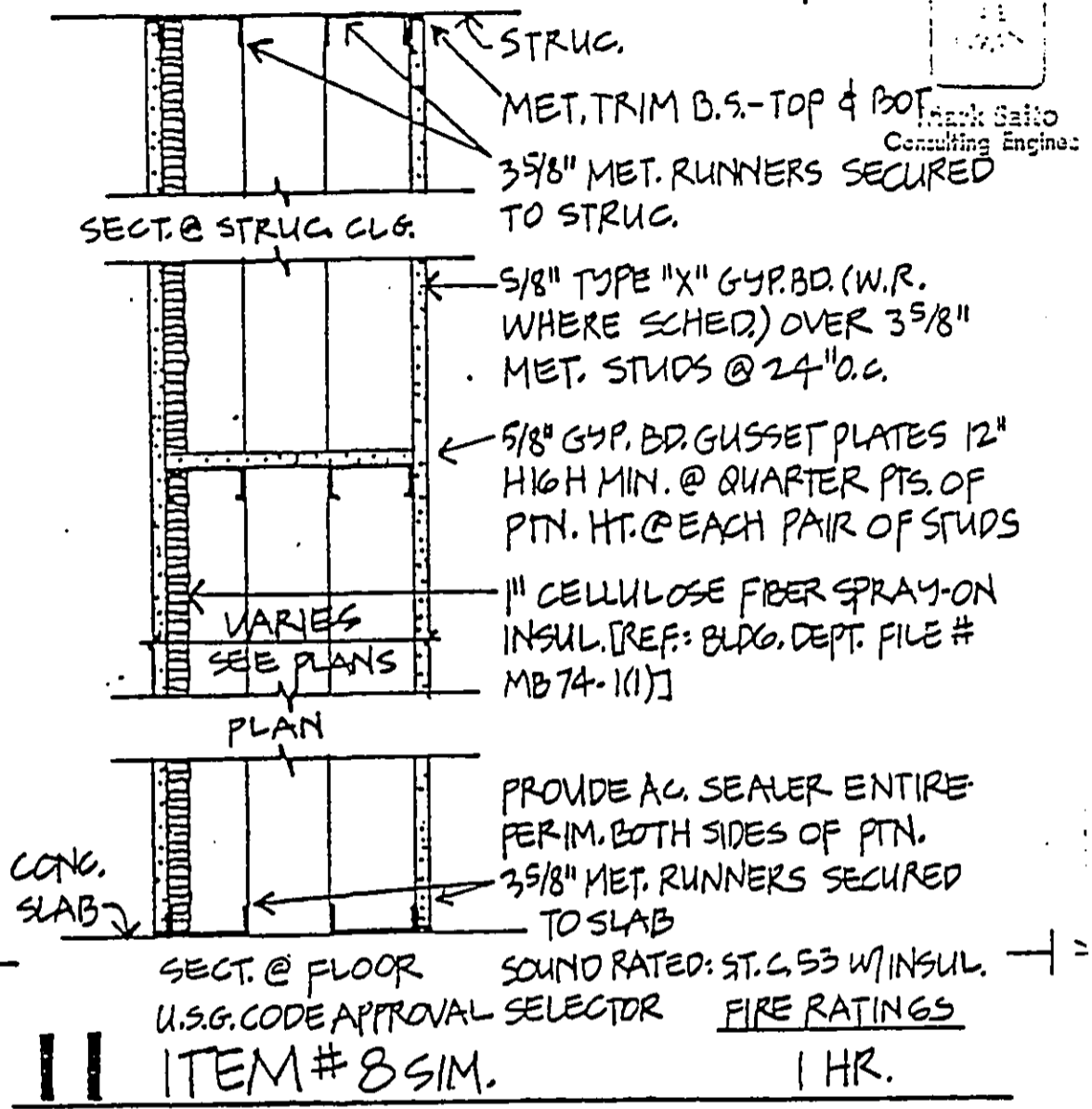
COPY TO SPEC. DEPT. (DATE) _____

(LEAVE BLANK)

NOTE: MAX. HEIGHT = 16'-0" @ 24" STD SPACING, 11'-0" @ 16" STD SPACING
 *CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

detail master

FILE NO. 9.250
9.1



Frank Saito
 Consulting Engineer

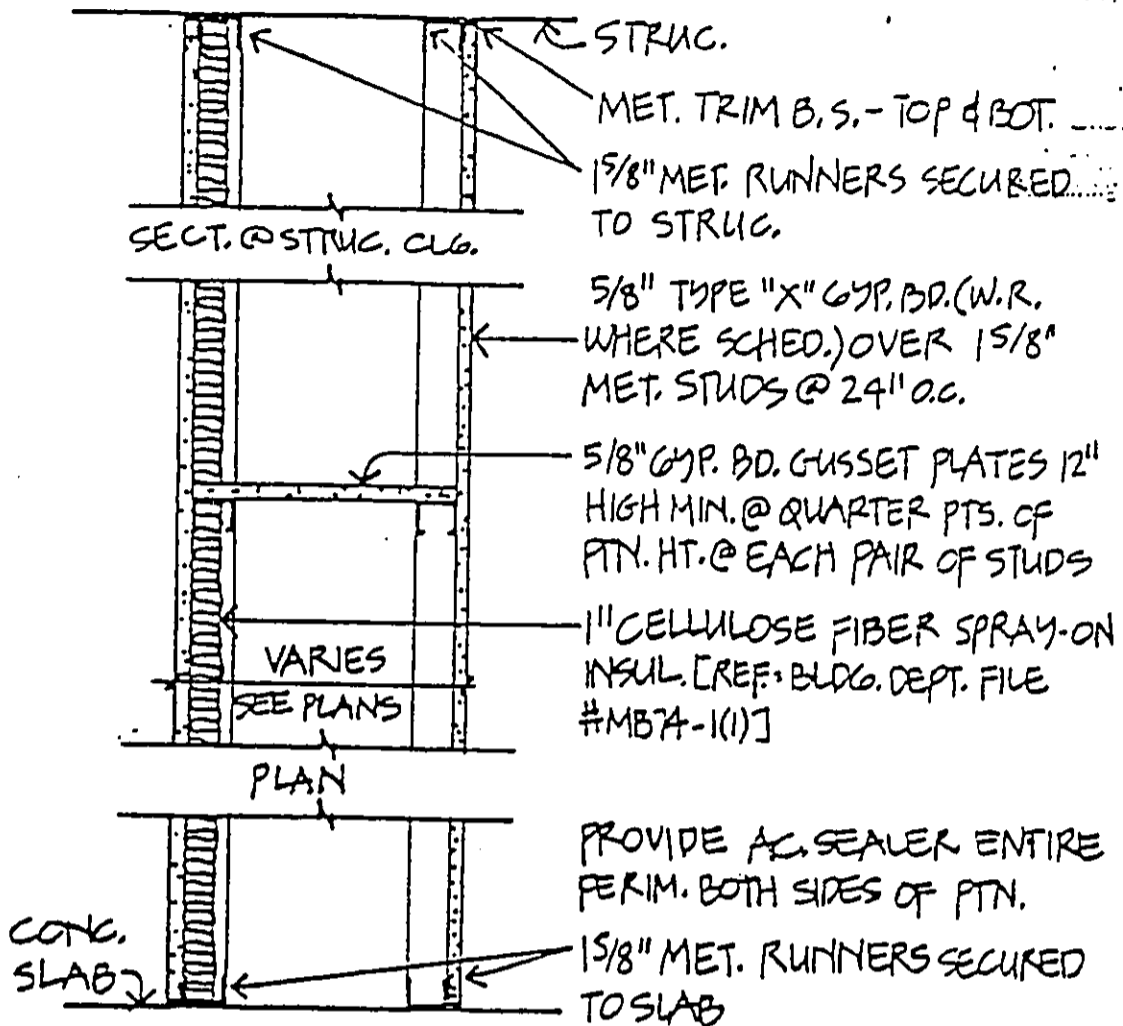
SPEC. REFERENCE GYPSUM WALLBOARD SEC. NO. 9.250
 PROJECT ORIGINALLY DRAWN FOR FILE
 DATE 4.21.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 9.1
 COPY TO SPEC. DEPT. (DATE) _____ (LEAVE BLANK)

SECT. @ FLOOR SOUND RATED: ST. 453 W/ INSUL.
 U.S.G. CODE APPROVAL SELECTOR FIRE RATINGS
 ITEM # 8 SIM. 1 HR.

NOTE - MAX. HEIGHT = 9'-5" @ 24" STUD SPACING, 10'-6" @ 16" STUD SPACING
 *CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

FILE NO. 9.250
9

detail master



SECT. @ FLOOR SOUND RATED: S.T.C. 53 W/ INSUL.

U.S.G. CODE APPROVAL SELECTOR

FIRE RATINGS

12

ITEM #8

1 HR.

13

SAME AS PTN. #12 EXCEPT
 MET. STUDS @ 16" O.C.

1 HR.

SPEC. REFERENCE GYPSUM WALLBOARD

SEC. NO. 9.250

PROJECT ORIGINALLY DRAWN FOR FILE

DATE 4.20.77

ORIGINAL

FILE 9.250

REV. _____

SCALE 1/2" = 1'-0"

NO. 9

COPY TO SPEC. DEPT. (DATE) _____

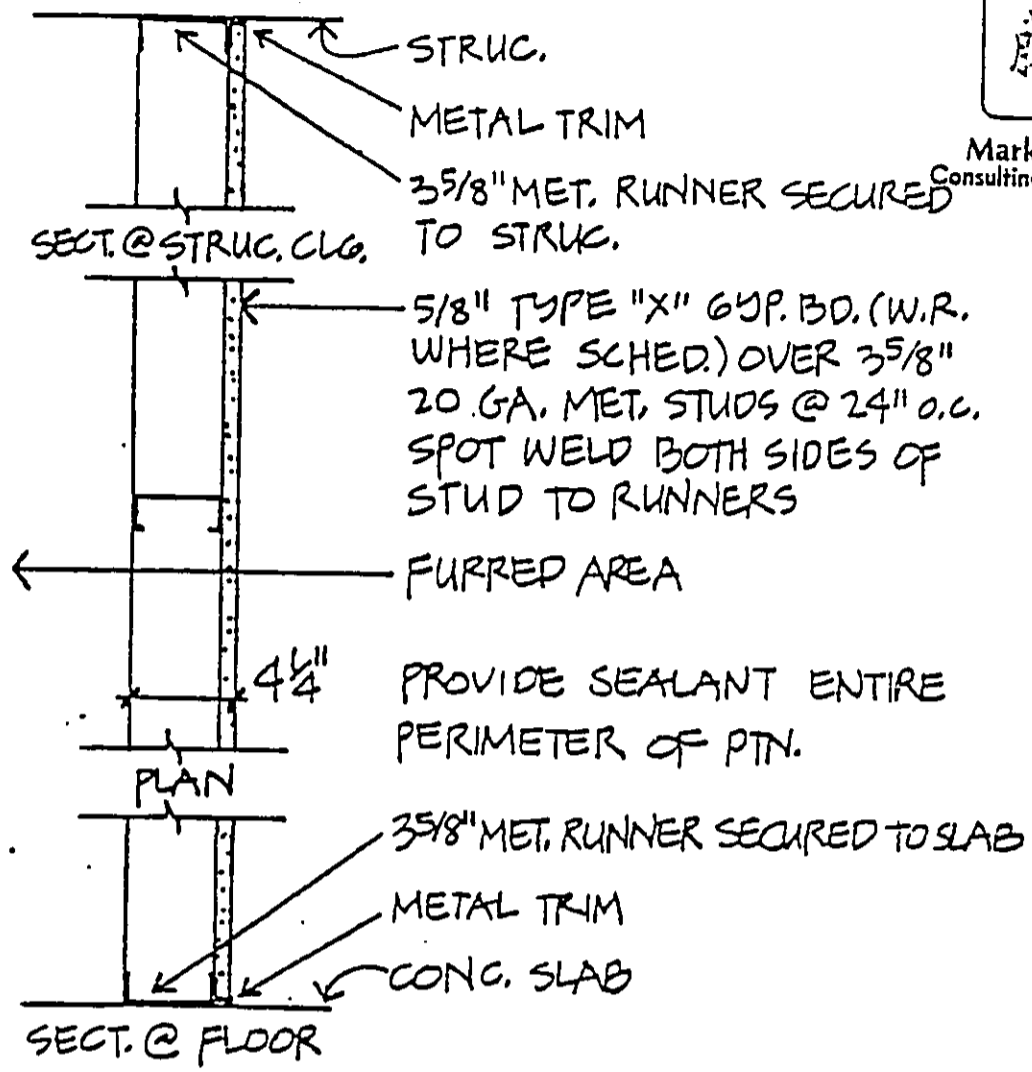
(LEAVE BLANK)

NOTE: MAX. HEIGHT = 15'-0" @ 24" STUD SPACING, 17'-1" @ 16" STUD SPACING
 *CAUTION: HEIGHTS DO NOT APPLY TO CASES W/ DIFFERENTIAL AIR PRESSURES

FILE NO. 9.250
6



Mark Saito
 Consulting Engineer



STRUC.
 METAL TRIM
 3 5/8" MET. RUNNER SECURED TO STRUC.
 5/8" TYPE "X" GYP. BO. (W.R. WHERE SCHED.) OVER 3 5/8" 20 GA. MET. STUDS @ 24" O.C. SPOT WELD BOTH SIDES OF STUD TO RUNNERS
 FURRED AREA
 4 1/4" PROVIDE SEALANT ENTIRE PERIMETER OF PTN.
 3 5/8" MET. RUNNER SECURED TO SLAB
 METAL TRIM
 CONG. SLAB

NON-COMBUSTIBLE
1 1/4 FURRED WALL

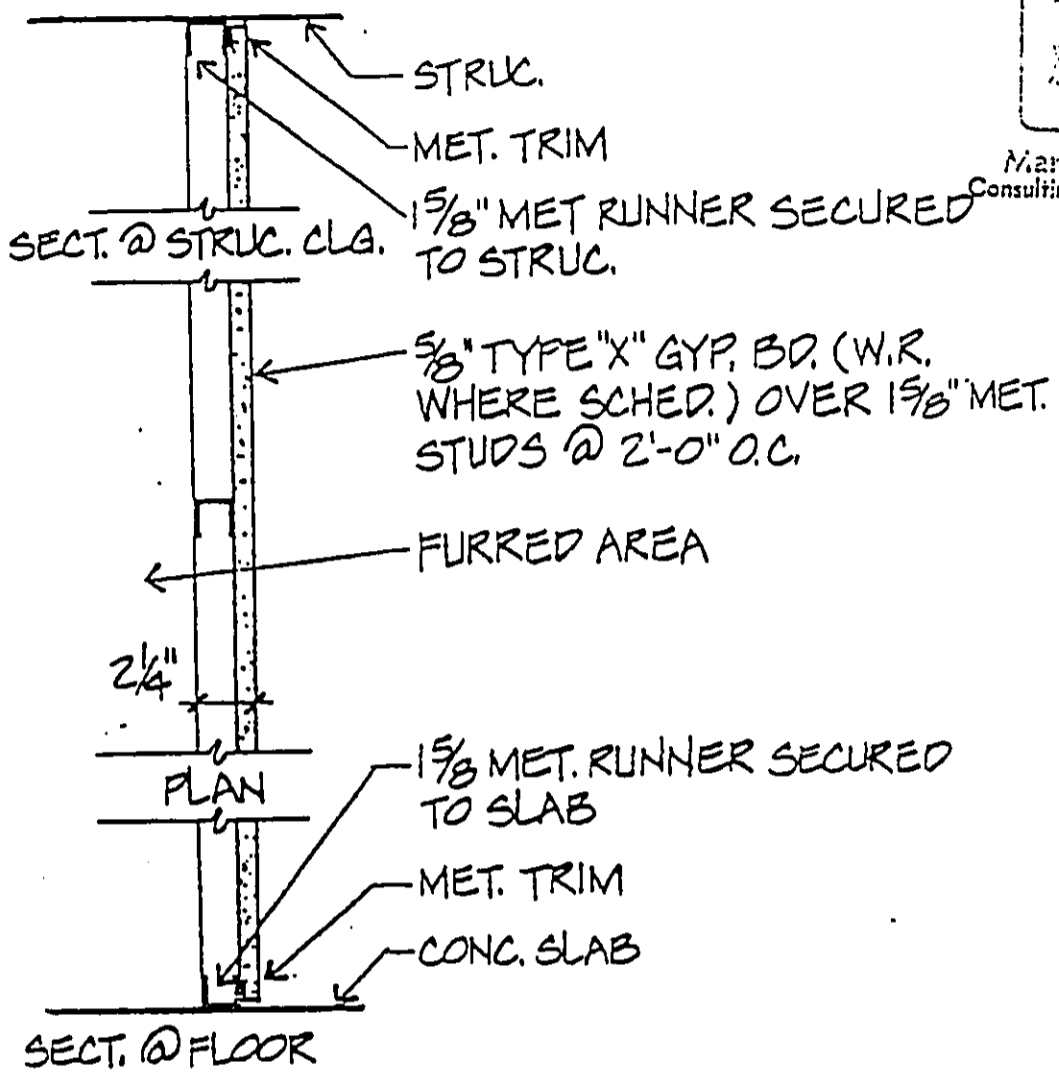
detail master

SPEC. REFERENCE GYPSUM WALLBOARD SEC. NO. 9.250
 PROJECT ORIGINALLY DRAWN FOR FILE
 DATE 4.19.77 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 6
 COPY TO SPEC. DEPT. (DATE) (LEAVE BLANK)

11/10/77
 11/10/77

1'-0" MAX. HEIGHT = 9'-0" @ 2'-0" STUD SPACING, 10'-3" @ 1'-4" STUD SPACING

FILE NO. 9.250
0.1



detail master

- SECT. @ FLOOR
- 15** NON-COMBUSTIBLE FURRED WALL
-
- 16** SAME AS PTN.# 15 EXCEPT MET. STUDS @ 1'-4" O.C.

SPEC. REFERENCE GYPSUM WALLBOARD SEC. NO. 9.250
 PROJECT ORIGINALLY DRAWN FOR ARIZONA MEMORIAL S/F
 DATE 15 FEB 78 ORIGINAL SCALE 1/2" = 1'-0" FILE 9.250
 REV. _____ NO. 0.1
 (LEAVE BLANK)
 COPY TO SPEC. DEPT. (DATE) _____

1.010 SUMMARY OF WORK

1. The Work covers construction of a _____ for _____ located at _____ Hawaii, Tax Map Key _____ .. Furnish _____ all labor, materials, equipment, services, and transportation necessary _____ and incidental to construction operations for the Work in accordance with final specifications and drawings. Provide Work not indicated on the drawings or expressly required by the specifications, but which is manifestly necessary for proper, full, and faithful performance of the Work in accordance with the true intent and meaning of the Documents.

SECTION 1B. SPECIAL CONDITIONS

1. TYPE OF CONTRACT:

- a. All general construction work and related items, including plumbing, and electrical work, required to complete the building in accordance with Drawings and Specifications shall be included in a single or a general contract. The General Contractor is recognized as a party to this Contract. Where the term "Contractor" is used in these specifications, the General Contractor is referred to.
- b. It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, connections, transportation, superintendence, temporary construction of every nature, all other services, facilities, and cost of every nature whatsoever necessary to execute and complete the entire work being done under the Contract Documents and deliver it complete in every respect.
- c. The General Contractor shall be held solely responsible for a complete building, the assignment of certain tasks or obligations to subcontractors is the responsibility of the General Contractor and the Designer shall not enter into any discussion with the General Contractor or any subcontractor concerning the responsibilities or obligations of any subcontractor.

2. PROCEED ORDER:

- a. No work under this Contract shall begin prior to the issuance by the Owner of a Proceed Order Authorizing the Contractor to proceed with the execution of the work.

3. SCOPE OF WORK:

- a. Labor and/or material required to complete work called for on the drawings and not mentioned in the specifications or vice-versa, are to be performed and/or furnished in as faithful and thorough manner as if fully noted by both.
- b. The Contractor shall provide all labor and material and perform all work as described in the accompanying Sections of this Specification and/or as shown on the drawings.
- c. The Contract will be based upon the completion of the work according to the Drawings and Specifications. It is the purpose of the plans and specifications to provide, to the Owner, a completed building. The Contractor will furnish and install all items, whether specifically shown or specified, that are necessary or required to furnish a complete watertight, weather-proof building.

4. DRAINAGE:

- a. The Contractor shall prevent mud, plaster, cement, concrete, and other building materials from getting into drain during the period of construction and he shall do all pumping; bailing, and drainage of all

water that may accumulate within or around the building during construction. He shall be responsible for cleaning any permanent piping in places that may become clogged. Under no conditions shall water used in flushing concrete or other cement mixes be deposited in or about lines.

5. PROGRESS REPORT:

- a. The Contractor shall submit monthly progress reports to the Owner and a copy to the **Designer**, showing each principal item of work whether ahead or behind schedule.
- b. The General Contractor will assemble all samples and/or color charts or cards for all items requiring the **Designer** to select color and submit same to the **Designer** at one time.

6. TEMPORARY TOILET ACCOMMODATIONS:

The Contractor shall furnish, install and maintain ample sanitary facilities for the workmen. Toilets shall be placed where directed and shall be installed and maintained as required by the local Building Department and Health Ordinances. The Contractor shall also provide the necessary enclosures to accommodate the toilets.

7. TEMPORARY OFFICE AND UTILITIES:

- a. The Contractor shall provide a temporary office where designated by the **Designer**, on the premises which shall be well lighted and of sufficient size to comfortably accommodate the needs of the Contractor and **Designer**.
- b. The Contractor shall, at his own expense, provide temporary heating as required for the proper protection and drying of all work.
- c. The Contractor will arrange for all the temporary electrical service to the construction project.
- d. The Contractor shall provide and pay for all charges for a project telephone for his, the **Designers** and the Owner's use.

8. CO-ORDINATION:

In the interest of expediting the work, it shall be the responsibility of the Contractor to co-ordinate the work of all trades and see that all cutting and patching required for the installation of all materials by all trades is properly executed.

9. SURVEYS AND LAYING OUT WORK:

- a. The General Contractor shall employ a competent Engineer to lay out the work, who shall check all positions of footings and walls in place, also the various levels of the structure, the intersections of lines at centers, test and check all elevations and levels and make a full report to the **Designer** in case of any discrepancy.
- b. This Contractor must verify the lines and levels given him, as he will be held responsible for the accuracy of the laying out of all work.

10. GROUND REPAIRS:
All pavements, sidewalks disturbed or damaged incident to construction work under this Contract shall be replaced by the Contractor as soon as possible in a manner satisfactory to the Designer and the local governing officials.
11. WATCHMAN:
A watchman shall be provided by the Contractor to furnish adequate protection to all parts of the work, if necessary.
12. CLEANING-UP DURING PROGRESS:
- a. This Contractor shall, at all times during the progress of the work, remove and keep the buildings clear of rubbish. The Contractor shall also make repairs to any damaged work before tendering building for acceptance.
 - b. Suitable containers with covers are to be provided for all refuse from meals eaten on the job site and the contents of these containers are to be removed from the job site at least once in every 72 hour period. All bottles, cans, paper and garbage of every description are to be constantly picked up and placed in the covered containers. All workmen are to be advised of the contents of this paragraph and nothing short of their full co-operation is considered reasonable.
13. PROTECTION:
The Contractor shall continually maintain adequate protection of all his work from injury due to weather, accident, or other cause, and shall protect the Owner's property from injury arising in connection with this Contract. All open trenches of a hazardous nature shall be covered at night and non-working days.
14. PLANS AND SPECIFICATIONS:
Contractor will be furnished 10 sets of General Contract Drawings at beginning of job. Any additional sets required by this Contractor shall be paid for by him.
15. CLEANING-UP:
In addition to removal of rubbish and leaving the building broom clean, the Contractor shall:
- a. Remove all putty stains and paint from all glass. Wash and polish glass.
 - b. Remove all marks, stains, finger prints and other soil or dirt from all finished and decorated surfaces.
 - c. Clean and polish all hardware.
 - d. Clean dirt, paint and dust from all fixtures and equipment.
 - e. Clean and polish all composition flooring covering.
 - f. Vacuum and clean carpets.

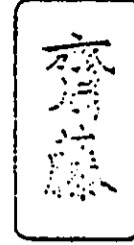
16. COMPLETION, FINAL INSPECTION AND ACCEPTANCE:

- a. The Contractor shall notify the **Designer** ten (10) days prior to the date on which final inspection of the building is to be made, and shall give such notification only if all work is completed. Upon receipt of such notice, the **Designer** shall exercise whatever means he deems necessary to have all work properly inspected for conformance with plans and specifications. Under no circumstances will final payment be made until the project has been fully accepted by the Owner and **Designer** as meeting all requirements of the plans and specifications.
- b. All guarantees embraced in or required by this contract and under the General Conditions, are subject to the terms of this paragraph unless otherwise expressly agreed in writing by the parties to this contract. Whenever guaranteed work is found faulty, the Contractor, whenever notified by the Owner, must immediately: (1) place in satisfactory condition in every particular, any of the guaranteed work, and (2) make good all damage to the work, grounds, or the equipment or contents thereof if such unsatisfactory condition or damage develops within the period stipulated by the guaranty, and is due to the use of materials or workmanship which is inferior, defective or not in accordance with the contract, and must make good any work or materials or the equipment and contents of said ground, which is disturbed in fulfillment of the requirements of this contract of any guaranty embraced in or required hereby. If this Contractor disturbs any work under another contract, he must restore such disturbed work to a condition satisfactory to the Owner and guarantee such restored work. Upon the Contractor's failure to proceed promptly to comply with the terms of any guaranty under this Contract or still running upon work executed by other Contractors, the Owner will have such work performed as he deems necessary to fulfill such sums as were expended so as to fulfill such guaranty.
- c. All guarantees under this contract, unless otherwise specifically agreed in writing by the parties of this contract, shall run from the date of authorization by the **Designer** of substantial completion. Unless otherwise specifically prescribed in the particular guaranty, usual wear and tear and the result of accident not chargeable to the Contractor or his agents are excepted from the requirements of this paragraph. Everything including labor and materials done in the fulfillment of any guaranty shall be without additional expense to the Owner. The opinion of the **Designer** as to the liability of the Contractor under such guaranty or as to the satisfactory fulfillment or compensation for the nonfulfillment thereof shall be final.
- d. Notwithstanding any reference in these specifications to any articles, devices, product, material, fixture, form or type of construction by name, make or catalog number, such references shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition; and the Contractor, in such cases, may, at his option, use any article, device, product, material, fixture, form or type of construction which, in the judgment of the **Designer** expressed in writing, is equal to that specified.

SECTION 1C. APPROVALS

1. Requests for approval of products and materials other than those specified where the term "Designer approved equal" occurs will be submitted to the Designer in writing along with brochures of proposed products seven (7) days prior to bid opening. Those products approved for bidding will be listed on an addendum.

2.200 EARTHWORK



Mark Saito
Consulting Engineer

1. Provide all earthwork operations to:
 - A. Excavate for building footings, foundations, and slabs.
 - B. Fill under building footings, foundations, and slab compacted to 95% of AASHTO T-180.
 - C. Excavate or fill for all paving areas including drives, parking, and walkway areas. Compact fill to 95% of AASHTO T-180.
 - D. Excavate or fill for general site grading. Compact fill to 90% of AASHTO T-180. Grade to 6" below finished grade for topsoil to be provided under separate contract.
2. From excavation areas, select and stockpile on site all usable lava rock required by Section 4.410 for use on lava rock veneer walls.
3. Protect areas designated to remain.
4. Excavation operations for the following are specified in Sections indicated.
 - A. Site Utilities: 2.550
 - B. Decorative Pools: Separate Contract
 - C. Landscape Planting: Separate Contract
 - D. Swimming Pool: Separate Contract

SECTION 2A. SITework

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

Excavation for structure shall not be made below elevation shown on drawings.

With allowance for inspection, forms and working space excavate cuts, pits and trenches for footings, driveways and parking area, and any other required work down to elevations required on the drawings.

Bottoms of excavation for wall footings shall be level, undisturbed and firm. Excavations carried below specified level shall be filled with concrete at the expense of the Contractor. Small soft spots in the excavated footing trenches shall be compacted to unyielding firmness.

3. ROUGH GRADING:

The entire ground area shall be graded to the rough grade elevations necessary to locate the building to the finish elevations indicated on the drawings. Existing ground shall be cut to allow a minimum of 18 inches structural fill beneath all concrete slabs and asphaltic concrete pavements.

4. STRUCTURAL FILL:

Existing material from cut and excavations shall not be used as structural fill. All structural fill used from existing grade to bottom of slab or pavement or 18 inches minimum, whichever controls, shall be imported granular fill such as crushed AA or other approved equal. Granular fill may have rocks of 3 inches maximum diameter. Structural fill shall be laid in 6 inch layers and compacted to 90% of maximum dry density.

5. FINISH GRADING:

Finish grading shall provide for proper slopes for surface drainage around and away from the building and as shown on the drawings. The finish grade elevations shown on the drawings indicate the top of the finish materials.

Fill shall be six (6) inch layers compacted to 90% of maximum density as determined by AASHTO T-180-73 I test method. Fill shall be constructed in approximately 6 inch level layers starting at the lower end and working upward. In roadway and parking areas, the top 2 feet of fill shall be compacted to 95% of the maximum density.

Fill materials shall be non-expansive, non-adobe soil free from debris, perishable or combustible materials, sod, and stones larger than 3 inches in maximum dimension. Decayed rubbish or debris shall not be allowed as fill material.

Entire area shall be graded to finish grade and contours with allowance for 6 inches of topsoil in grass and ground cover areas.

Topsoil shall be screened, (1/2 inch screen) natural, fertile, friable and shall be free of stones, weeds, weed seeds, sticks and subsoil in any quantity. Topsoil shall be evenly spread and raked to a uniform plant at required contours and grade providing for drainage as shown on the site grading plan.

Under interior and exterior concrete slabs, the cushion shall consist of 4 inches of well-graded gravel less than 3/4 inch and greater than 1/4 inch in size, compacted to level surface of 95% compaction as determined by AASHTO T-180, Method "D".

Grading shall comply with Ordinance No. 168, and the Erosion and Sedimentation Control Standards and Guidelines of the Department of Public Works, County of Hawaii.

6. STAKING OUT:

Contractor shall stake out entire work, erect substantial batter boards showing construction lines and levels and install permanent bench marks which shall be kept throughout the duration of the project.

Contractor shall verify all dimensions and grades and should he discover any discrepancies in the measurements, he shall immediately notify the Designer before proceeding with the work. Otherwise, he shall be held responsible for any costs involved in correcting construction wrongly placed due to such discrepancies.

7. GROUND STERILIZATION:

Provide ground sterilization under all asphaltic concrete paving surfaces.

Upon completion of the sub-base, treat the entire surface with solution sprayed on at the rate of 200 gallon/acre using 35 lbs. Karmex and 15 lbs. Dowpon.

8. TERMITE TREATMENT:

The Contractor shall poison the soil for ground termites under all footings, foundations, walls, slabs, and around the perimeter of the building to lines 5'-0" outside the building line. Materials shall be Dieldrin 0.5% solution, or Chlordane 1.0% solution.

COVERAGE FOR ROCKY AREA AND FILL: Four gallons per 5 lineal foot for footings, foundations and walls and at the perimeter of the building. One gallon per five square feet for slab on grade.

GUARANTEE: Ground termite treatment shall guarantee against infestation for five-year (5 yr.) period after final acceptance of work.

Guarantee shall be in written form and shall be presented to the Designer at the completion of the work.

9. ASPHALTIC CONCRETE:

Roads and parking areas shall be constructed in accordance with the following sections of the current "Standard Specifications for Public Works Construction"

dated May 1975, Department of Public Works, County of Hawaii, and all revisions.
(Paragraphs concerning Measurements and Payments in these Sections are not applicable to this project.)

- | | |
|-------------------------------|------------|
| (1) SUBBASE COURSE | SECTION 30 |
| (2) BASECOURSE | SECTION 31 |
| (3) ASPHALT CONCRETE PAVEMENT | SECTION 34 |

10. TRENCH EXCAVATION AND BACKFILL:

Excavation for the pipe trench shall be to the lines and grades indicated on the drawings allowing for the thickness of the pipe cushion for the pipe. The bottom of the trenches shall be level, solid and free of loose material.

Any part of the trench overexcavated below grade by the Contractor shall be corrected with select material thoroughly compacted in place at no extra cost to the Owner.

The pipe cushion material shall be 6 inches of black sand, crusher screening S4C, beach sand or coral.

Backfilling for the pipe trench shall be done by hand shoveling up to 12 inches above the top of pipe with approved select material free from all debris, wood, vegetable matter and all stone, rock or concrete larger than 1 inch and compacted. The balance of the backfill shall be placed in layers and not greater than 12 inches and compacted.

No lines shall be covered prior to testing and inspection by proper authorities. Backfilling shall be made only after approval by the Engineer.

2,550 SITE UTILITIES

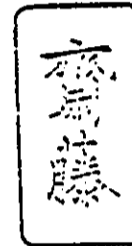


Mark Saito
Consulting Engineer

1. Site utilities are those located outside a line drawn 5'-0" outside of the building line unless otherwise noted.
2. Provide trenching, excavation, compacted fill, backfill, and operations required to install all site utilities including:
 - A. Water service system
 - B. Gas service system
 - C. Sanitary sewer system
 - D. Underground electrical service system
 - E. Underground telephone service system
 - F. Site and landscape lighting
3. Site utilities shall conform to the requirements of the respective utility company.
4. Provide all required testing and make all corrections required by such testing prior to backfilling of trenches.
5. See site utility plans for specific requirements of each system.

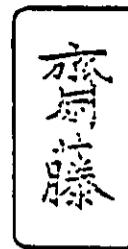
2.600 PAVING AND SURFACING

1. All work according to "Standard Specifications for Public Works Construction", May 1975 edition, of the Department of Public Works, County of Hawaii.
2. Base Course: Section 31, Aggregate base, 4" thick.
3. Bituminous Prime Coat: Section 33.
4. Asphaltic Concrete: Section 34, 2" thick minimum, 3" at Main Drive and Service Drive.
 - A. Parking and Driveway Areas: Mix No. 4 (Fine).
 - B. Walkways and Tennis Court Areas: Mix No. 5 (Extra Fine).



Mark Saito
Consulting Engineer

2.710 FENCES AND GATES



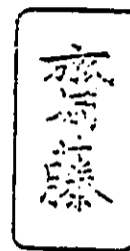
1. Fencing: Chain Link as manufactured by Jorgensen Steel 12'-0" High with 2" steel pipe supports at 8'-0" centers maximum. Top, center, and bottom rails of 2" steel pipe.
2. Gate 3'-0" x 7'-0" with padlock type self latching latch and double acting pivot hinges.

Mark Saito
Consulting Engineer

(for Tennis Courts)

2.733 TENNIS COURT PAVING

1. Provide colored tennis court paving over asphaltic concrete paving installed by Section 2,600. Tennis court paving to be "Laykold Colorcoat System" manufactured by Chevron, "Flexipave" manufactured by California Products Corp., or equal. Color of surfacing as selected.
2. Courts shall be complete, ready for play, including net posts, nets, and regulation court markings. Net posts and net to be selected.



Mark Szito
Consulting Engineer

2.760 SITE FURNISHINGS

1. Tennis Court Bleachers: As manufactured by Miracle Recreation Equipment Co., Sturdisteel Co., Playtime Equipment Corp., or equal, fabricated of galvanized steel with preservative treated wood seats and steel pipe guardrails.
2. Units shall be structurally designed by the manufacturer to seating capacity indicated.
3. Set structure of bleachers on concrete footings and secure per manufacturer's instructions.
4. Site seating: Fabricate of precast exposed aggregate concrete bases and redwood slat seats as indicated. Finish seats with semi-transparent stain prior to attachment to bases.



Mark Saito
Consulting Engineer

SECTION 2B. SEWER SYSTEM

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

The work to be performed under this section shall include furnishing all labor, materials, equipment and tools necessary to install exterior sanitary sewer piping.

All construction shall be performed in accordance with the Standard Details, August 1976, and the following section of the Standard Specifications for Public Works Construction, May 1975, of the Department of Public Works, County of Hawaii, as amended. (Paragraph concerning Measurements and Payments in these sections are not applicable to this project.)

(1) VITRIFIED CLAY SEWER PIPE AND APPURTENANCES SECTION 18

Trenching and backfilling is specified under SITE WORK Section.

SECTION 2C. WATER SYSTEM

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

The work to be performed under this section shall include furnishing all labor, materials, equipment and tools necessary to install exterior water system and other appurtenances.

All construction shall be performed in accordance with the Water System Standards of the Department of Water Supply dated March 1965 as amended. (Paragraph covering Measurements and Payments in these sections are not applicable to this project.)

Trenching and backfilling is specified under SITE WORK Section.

3. LOCATION OF EXISTING UTILITY LINES:

The Contractor shall be responsible for precisely laying out the exterior utility line shown on the contract drawings and as provided elsewhere in these specifications. The location shown on the contract drawings of the existing utility line which the new line is to connect to was determined on the basis of the best information available; however, no assurance can be provided that the actual locations will be precisely as shown on the contract drawings.

In performing all work, the Contractor shall exercise due care and caution necessary to avoid any damage to and impairment in the use of any existing utility line. Any damage inflicted on existing lines resulting from the Contractor's operations shall be immediately repaired and restored as directed by the Engineer at the Contractor's expense.

4. WATER:

The installation, testing, disinfection and acceptance of water lines shall be governed by the Department of Water Supply Standards.

Water lines shall be soft copper, Type K. All fittings, valves and appurtenances for any particular line shall be equivalent and consistent with the type and class of pipe and conform to the requirements specified in the Department of Water Supply Standards for such fittings, valves and appurtenances.

Service valves for the water lines shall be installed at the locations shown on the contract drawings. Valve boxes for the service valves shall be of the type specified in the Standard Details of the Department of Water Supply Standards.

SECTION 2D. SOIL PREPARATION

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. SCOPE:

Spread and incorporate into the existing soil surface, specified amendments and fine grade all ground cover and grass planting areas.

3. MATERIALS:

a. Fertilizer shall be 10-30-10, pelleted or granulated, delivered to the site in manufacturer's original unopened containers, each bearing the manufacturer's guaranteed analysis. All fertilizer shall be free flowing and dry.

b. Iron sulfate

c. "Gro-Power"

4. PROCEDURES:

a. Overall pre-plant (for all areas of *Carpobrotus edule* and Bermuda Grass).

1) Broadcast evenly:

Amount per 1000 sq. ft.:

25 lbs. fertilizer

20 lbs. iron sulfate

Thoroughly incorporate the above materials into the top four (4) inches of existing soil by rotary hoe cultivation.

b. Specific pre-plant (for area of *Microsorium scolopendria*).

1) Broadcast evenly:

Amount per 1000 per sq. ft.:

25 lbs. fertilizer

20 lbs. iron sulfate

100 lbs. "Gro-Power"

Thoroughly incorporate the above materials into the top four (4) inches of existing soil by rotary hoe cultivation.

c. Settle soil by watering thoroughly.

- d. Fine grade all planting areas to finish grade removing all rocks and debris over one (1) inch in diameter. Follow slopes and drainage patterns shown on the grading plan.

SECTION 2E. PLANTING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. SCOPE:

Plant new trees, palms, shrubs, and ground covers where indicated on the drawings and as specified herein.

3. MATERIALS:

- a. Fertilizer shall be 10-30-10, pelleted or granulated, delivered to the site in manufacturer's original unopened containers, each bearing the manufacturer's guarantee analysis. All fertilizer shall be free flowing and dry.
- b. Topsoil shall be fertile and friable, capable of producing good plant growth; shall be brown or black in color; shall be free from nut grass.
- c. Manure shall be well-rotted chicken manure free of stones, and debris.
- d. Plant tablets shall be "Agriform Planting Tablets", 20-10-5, 21-gram.
- e. Plant materials shall be healthy stock of the species and sizes specified on the drawings. The Owner or his representative shall be the final arbitrator in decisions regarding plant identification, nomenclature, quality and size. No substitutions of plant materials shall be made without written authorization of the Landscape Architect. The Contractor shall provide the plant quantities necessary to complete the intent of the plantings as shown and located on the Planting Plan.
- f. Grass seed shall be *Cynodon dactylon*, certified to be 99.58% purity and 85% germination. Seed shall be furnished in original sealed containers.
- g. Tree stakes shall be two (2) inch square, rough construction grade, redwood at lengths shown in the details.
- h. Tree ties shall be new or used reinforced rubber or plastic hose over 12-gauge-pliable galvanized iron wire, or commercial ties made of automobile tie casing
- i. Redwood Hedder shall be 2 x 4, rough construction grade, redwood treated with penta per detail. Stakes shall be No. 6 rebars by 18" length.

4. PROCEDURES:

- a. Prepare backfill mix in sufficient quantity for all planting backfill operations. Backfill mix for all plants except the *Arecastrums* shall be of the following formula:

1 cubic yard topsoil

5 lbs. fertilizer

Backfill mix for Arecastrums shall be the following formula:

3/4 cubic yard topsoil

1/4 cubic yard manure

2 lbs. fertilizer

Thoroughly blend all materials prior to use as backfill and prior to beginning any planting operations.

- b. Dig planting holes for 5 gal. trees and palms, and 1 gal. shrubs and ground covers in locations shown on the drawing with care to align with building columns or parking stripes where noted. Remove soil excavated for holes and dispose off site.

Backfill hole with prepared, appropriate backfill mix and settle with water to such a depth that when backfill is firmed down and rootball is placed on the backfill, the top of the rootball will be approximately one inch higher than the surrounding finish grade.

Backfill one half the remaining hole or halfway up the rootball. Place plant tablets adjacent to the rootball at the following rates:

1 gal. - 1 tablet

5 gal. - 3 tablets

Complete backfilling. Firm down mix but do not pack. Build berm around edge of rootball as shown in the details to provide a watering basin.

Water plant in completely by filling basin with water and allowing water to soak in. Repeat a minimum of three times.

Stake all five (5) gallon size trees. Drive stakes solidly into ground after the holes are dug but before placing the rootball. Secure tree to stakes at two locations as shown in the detail.

- c. Ground cover shall be planted only in moist soil.

Space cuttings equally and uniformly at spacings indicated on the drawing.

Carefully maintain a smooth, uniform finish grade and do not alter drainage patterns. Remove all ridges and depressions.

Water thoroughly and immediately after planting.

- d. Grass planting shall be started immediately after soil preparation in order that the soil will not require further tillage and raking.

Broadcast seed uniformly by hand or machine during a windless period at the rate of 5 lbs. per 1000 square feet. Sow one half the seeds in one direction and the remainder at right angles to the first direction.

Rake the surface to incorporate the seed into the top 1/4 to 1/2 max of the soil.

Keep the soil continuously moist until the grass is established.

SECTION 2F. PLANTING INSPECTIONS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. SCOPE:

Provide for a pre-maintenance inspection and a final inspection of all planted areas and plants.

3. PRE-MAINTENANCE INSPECTION:

- a. At the completion of all landscape construction and planting operations, after the grass seed has begun germination and signs of grass are visible, and prior to the commencement of the Formal Maintenance Period, the pre-maintenance inspection shall be performed.
- b. The Contractor shall request the inspection in writing to the Owner or his representative, five (5) working days prior to the completion of work in order that a mutually convenient time for inspection may be arranged. The Contractor and the Owner or his representative shall be present at the inspection.
- c. At the time of the pre-maintenance inspection, the Contractor shall have all areas free of weeds, neatly cultivated, and all plant basins, stakes and ties in good order.
- d. If, after the inspection, the Owner or his representative, is of the opinion that all work has been performed per the drawings and specification, he will give the Contractor written notice of preliminary acceptance and approval to commence the Formal Maintenance Period.

4. FINAL INSPECTION:

- a. At the completion of the Formal Maintenance Period, the final inspection shall be performed.
- b. The Contractor shall request the final inspection in writing to the Owner or his representative, five (5) working days prior to the end of the formal maintenance period in order that a mutually agreeable time for the inspection may be arranged.

The Contractor and the Owner or his representative shall be present at the inspection.
- c. At the time of the final inspection, the Contractor shall have all areas free of weeds, neatly cultivated, all areas fertilized as specified under the Formal Maintenance Period, and all plant basins, stakes and ties in good order.
- d. If, after inspection, the Owner or his representative, is of the opinion that all work has been performed as specified under the Formal Maintenance Period, he will give the Contractor written notice of satisfactory completion of the Formal Maintenance Period.

- e. If, after the inspection, the Owner or his representative, is of the opinion that all or certain portions of the work are not acceptable under the terms and intent of drawings and specifications, the Formal Maintenance Period for all work shall be extended at no additional cost to the Owner until all work is accepted by the Owner or his representative.

SECTION 2G. PLANTING MAINTENANCE AND GUARANTEE

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. SCOPE:

Maintain all plants and planted areas in optimum growing condition and appearance.

3. PERIOD OF MAINTENANCE:

Maintenance, as specified herein, shall coincide with the delivery of the first plant materials to the site and shall continue for thirty (30) calendar days after the commencement of this formal maintenance period.

4. MATERIALS:

Fertilizer:

Ammonium sulfate 21-0-0

5. PROCEDURES:

a. Weeding:

All areas under this contract shall be kept weed free at all times until acceptance by the Owner or his representative.

b. In general, all plants and grass areas shall be kept at optimum growing condition by watering, mowing, replanting, weeding, fertilizing, cultivating, repairing stakes and ties, restoring watering basins, spraying for diseases and/or pests, removal for site of dead or dying material and their immediate replacement, maintaining grades, repairing erosion damage, protection from trespass and any other reasonable operation of Landscape Maintenance.

c. Fertilize the grass and ground cover at the end of the Formal Maintenance Period. Apply the fertilizer specified in this section at the rate of two (2) pounds per one thousand (1000) square feet of planted area. Broadcast evenly and water in immediately, removing any fertilizer from direct contact with any plant foliage.

6. GUARANTEE AND REPLACEMENT:

a. The purpose of this guarantee is to assure the Owner receives plant materials of the first quality, planted and maintained in a thorough and careful manner. Sometimes plants have latent defects or are shocked in the process of transplanting, Therefore:

"The Contractor shall guarantee all plants from latent defects or disease which may appear after acceptance of the plant, at the end of the Formal Maintenance Period, for a period of one year."

- b. The Contractor shall not be held liable for loss of plant materials during this guarantee period due to lack of care, vandalism or accident.
- c. The Contractor shall install replacements immediately after the determination of such is made. Replacement plant materials shall be the same species and size as originally planted and replanting shall follow the planting section of these specifications.

SECTION 2H. DRAINAGE

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

The work to be performed under this section shall include furnishing all labor, materials, equipment and tools necessary to install storm drain piping, drop intake and outlet structure.

All construction shall be performed in accordance with the Standard Details, August 1976, and the following sections of the Standard Specifications for Public Works Construction, May 1975, of the Department of Public Works, County of Hawaii, as amended. (Paragraph concerning Measurements and Payments in these sections are not applicable to the project.)

- | | |
|-------------------------|------------|
| (1) DRAIN PIPES | SECTION 24 |
| (2) CONCRETE STRUCTURES | SECTION 40 |
| (3) REINFORCING STEEL | SECTION 48 |

Trenching and backfilling is specified under SITE WORK Section.

SECTION 2I. PAINTING PARKING STALLS

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

The work to be performed under this section shall consist of all labor, materials, tools and equipment for the painting of the parking stalls; said work shall include, but is not limited to, preparation of wearing surfaces, laying out, aligning, marking, painting and such other items of work as are required to complete all work in strict accordance with the plans and specifications.

3. MATERIALS:

All materials furnished by the Contractor for incorporation in the work shall be new, free of any defects which may render them unfit for installation and/or use, shall conform to the requirements of the plans and/or specifications and shall be the standard product of a reputable manufacturer of supplier, as specified herein and/or approved by the Engineer.

Paint

White Striping: The paint shall be white non-reflective, first quality J.E. Bauer Stock No. 896A9 or 897A9; Gleem 98-168 or 98-169; W.P. Fuller 542-W-13; Glidden GL-73980; Sherwin Williams C97WY 44; Devoe Trafficline 44201 or 44256; of Boysen Traffic Paint White C46-S1246 or approved equal.

4. CONSTRUCTION METHODS:

All work performed by the Contractor in the painting shall be done in a workman-like manner by men who are qualified by trade, skill, experience and classification. All work shall comply in all respects with the requirements of this section. Wherein this section may fail to specify a given construction method, common practice and/or a method recommended by the Contractor, if approved by the Engineer, shall be utilized.

Layout and Alignment: On those sections of pavements where no previously applied figures, markings or stripes are available to serve as a guide, suitable layouts and lines of proposed strips shall be spotted in advance by hand or machine paint application. Control points shall be spaced at such intervals as will insure accurate location of all markings.

The Contractor shall provide an experienced technician to supervise the locations, alignment, layout, dimensions and application of the painting.

Application of Striping: Markings shall be applied at four (4) inch width unless otherwise specified at the locations and spacing indicated on the plans. Paint shall not be applied until the layouts, indicated alignment and the condition of the existing surface have been approved by the Engineer.

The paint before application shall be mixed in accordance with the manufacturer's instructions. The paint at its original consistency, without the addition of thinner shall be thoroughly mixed and applied to the surface of the pavement with the marking machine. Sufficient paint shall be applied to produce markings with clear, true edges and even uniform film, color and cross section. The film shall be sufficient thickness to completely cover the pavement and shall provide adequate pigment for the proper reflection of light. If the paint is applied by brush, the surface shall receive two coats; the first coat shall be thoroughly dry before the second coat is applied.

A time interval of two weeks shall elapse from the application of the bituminous seal coat or the placement of the bituminous surface course to the period of marking the pavement. The paint shall not excessively bleed, curl or discolor when applied to bituminous surfaces.

Paint shall be applied uniformly by suitable equipment at a rate of not less than 100 and not more than 125 square feet per gallon.

SECTION 3A. CONCRETE

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. MATERIALS:

a. Cement:

The cement shall be Portland Cement conforming to the current ASTM Specifications C-150, Type 1.

b. Aggregates:

Fine and coarse aggregates shall conform to the current ASTM Specifications C-33, except that local aggregates may be used with the approval of the Architect.

c. Water:

Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalies, organic materials, or other deleterious substances.

d. Admixture:

Admixture shall be pozzolith, plastiment or approved equal, and shall conform to ASTM Specification C-494. Admixture shall be added in strict accordance with manufacturer's direction.

3. METAL REINFORCEMENT:

a. Reinforcing Bars:

Conform to ASTM A-615, Grade 40, intermediate grade. Deformations to conform to ASTM Specifications A-305

Welded wire fabric shall conform to the requirements of the "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" ASTM A-185, and shall be galvanized.

b. Storage of Materials:

Cement and aggregates shall be stored in such a manner as to prevent deterioration or contamination with foreign matter. Cement which has become caked, partially set, or otherwise deteriorated, or any material which has become damaged or contaminated, shall be rejected for use.

c. Inspection:

Notify ~~Designer~~ 48 hours before pouring of concrete. Place no concrete until the ~~Designer~~ has inspected and approved reinforcing work, anchors, etc. This approval, however, shall not be construed to relieve the Contractor of his responsibility to place all reinforcement in accordance with the contract drawings.

4. CONCRETE:

Concrete shall be designed in accordance with the ACI Standard Recommended Practice for Design of Concrete Mixes, ACI 613. All concrete shall contain an admixture.

Concrete shall be ready-mixed in accordance with ASTM Specifications C-94. The time elapsed between adding the water to the mix and the placing of the concrete shall not exceed ninety minutes. No additional water may be added to the concrete prior to placing.

All concrete shall have 4" maximum slump.

Minimum 28 days compressive strength shall be as shown on drawings.

5. FORMS:

Form shall be of wood, plywood, steel or other approved material. The type, size, quantity and shape of all materials which the forms are made of shall be subject to the approval of the Designer

Forms shall be true to line and grade, watertight, and sufficiently rigid to prevent deformation under load. Responsibility for their accuracy shall rest with the Contractor. Surfaces shall be smooth and free from irregularities, dents, sags, or holes when used for permanently exposed surfaces.

6. REINFORCEMENT:

Metal reinforcement, at the time concrete is placed, shall be free from heavy scale or rust, or other coatings that will destroy or reduce the bond. All bars shall be bent cold.

Metal reinforcements shall be placed accurately and adequately secured in position by concrete or chairs and spacers.

All reinforcement shall be furnished in lengths indicated on the drawings. Splicing of bars where indicated shall be lapped 30 bar diameters.

7. PLACING CONCRETE:

Remove all extraneous matter from within forms. All surfaces to receive concrete shall be clean, damp, and free from water.

Place concrete in approximately horizontal layers not over 1 foot thick. Compact and work concrete around reinforcing and into corners by use of high frequency internal vibrators of an approved type having frequency vibration not less than 7,000 impulses per minute.

8. OTHER TRADES:

Install all inserts, anchors and other fastening devices required for installation of other work and provide shop drawings for those work.

Furnish to masonry trade all vertical steel required for its work.

Allow work specified under other sections to install all required sleeves, conduits, outlet boxes, etc.

9. CURING:

All concrete shall be cured immediately following the finishing operation. Curing compounds shall be used in strict compliance with manufacturer's recommendations. Submit to the Designer for approval the manufacturer's brochure of the type of curing compound to be used. Curing compound used shall be compatible with the applied floor finish.

10. REPAIRING CONCRETE SURFACES:

After forms are stripped and ties withdrawn, treat with "Weldcrete" or equal bonding agent and grout full with mortar mad with integral waterproofing. Match patching with adjoining surfaces, both in color and texture. Cut out ragged or uneven corners and honeycomb and build up with "Weldcrete" or equal bonding agent and cement mortar. Metal form ties shall be cut back at least 3/8" in concrete and holes patched.

Form fins and rough or uneven surfaces shall be rubbed and/or ground to smooth uniform appearance.

11. FORMED SURFACE FINISHES:

Rough concrete will be permitted in areas where no finish is required. In all exposed interior and exterior concrete surfaces, brush surface with a thin wash composed of equal parts of cement and fine aggregate and steel trowel so that the entire surface is uniform in texture and color and free from air holes.

12. SLAB FINISHES:

For interior floor slabs, steel trowel to produce a smooth surface. Additional trowelling shall be done after the surface has hardened sufficiently. The final trowelling shall be done to a point when the finished surface is free from trowel marks and shall be uniform in texture and appearance. Any high spots shall be ground to level and smooth finish to the satisfaction of the Designer.

For surfaces to receive waterproofing and membranes, the slab shall receive a light trowelled finish.

For walkways, provide a salt finish. Before the concrete surface has been steel trowelled, the surfaces shall be sprinkled with rock salt. Submit sample of salt finish before any slab work is done.

13. FLOOR SLABS ON EARTH:

Concrete floor slabs on earth shall be placed over a compacted 4" layer of base course. Provide moisture barrier over base course of .006" thick polyethylene film. Do not pour floor slab until termite soil poisoning has been applied.

14. CLEAN-UP:

At completion of the work, clean-up and remove all rubbish and debris from the premises as resulted from this work to the satisfaction of the Designer.

SECTION 3B. CONCRETE PILING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. TYPES OF PILES:

Piling shall be 12" x 12", 40 ton precast, pre-tensioned, pre-stressed concrete piles, manufactured in accordance with the latest PCI specifications.

3. PRE-TENSIONED, PRE-STRESSED PILE

a. Materials:

1) Concrete:

- a) Minimum 29-day strength shall be 6000 psi.
- b) Minimum strength at time of release shall be 3500 psi.
- c) Steam curing may be used to accelerate strength gain.

2) Pre-stressing Strands:

- a) Strands shall be of the uncoated 7-wire high tensile cold drawn type, stress relieved as a unit after forming into strand.
- b) Minimum ultimate tensile strength shall be 250,000 psi.
- c) Initial steel stress shall not exceed 70 per cent of the minimum ultimate tensile strength.
- d) The shape of the stress-strain curve, ductility, creep and relaxation properties shall conform to the latest recommendations of the ACI-ASCE Joint Committee 323.

3) Reinforcing Steel:

- a) All reinforcing bars shall be of intermediate grade and conform to latest ASTM Specifications.
- b) Spiral shall be cold drawn wire with a minimum useful limit stress of 60,000 psi, or intermediate grade rods with a useful limit stress of 40,000 psi and conform to the latest ASTM Specifications.

4. DRIVING OF PILES:

- a. Driving shall not be permitted until the concrete has attained a minimum strength of 5,000 psi, nor until 5 days after casting, whichever is later. Piles shall be handled, supported, and stored in such manner as to avoid excessive bending stresses that can cause cracking. Piles shall be protected with an approved cushion and cap while being driven to prevent spalling or other injurious results.

- b. All piles shall be driven with a hammer developing an energy per blow of at least 15,000 ft. lbs. Pile drivers shall have firmly supported leads to guide the hammer from the highest point to the lowest point to which it must travel.
- c. All piles shall be driven straight and true. The driving of each pile shall be continuous without intermission until the pile reaches its final resistance. All piles shall be driven into the underlying rock layer to about 45 blows per foot for 5 feet, but not to be overdriven to more than 10 blow per inch for the last 2 inches or 20 blows for the last fraction of an inch.
- d. If proper resistance to driving is not attained at contemplated level of cutoff, an additional length of pile shall be supplied by splicing, and the driving shall be continued. Such splicing shall develop the necessary strength of the pile in bearing, shear and bending.
- e. The pile driving contractor shall observe that piles already in place are not heaved upward during pile driving. Any pile that has heaved upward shall be redriven to its original position.

5. PILE LENGTHS:

All bids for piling shall be based on 30 foot lengths. Due to erratic sub-soil conditions, six probe piles of 35 foot lengths shall be driven to determine the final cast lengths for piling. Driving of probe pile shall be as specified hereinbefore.

6. CUTTING OFF:

The tops of all piles projecting above the cutoff elevation after piles have been driven to required bearing shall be cut off at the proper elevation and the cutoffs shall be removed from the site. Extend all strands 18" minimum into pile cap.

7. PILE DRIVING RECORDS:

The Contractor shall keep a record as each pile is driven and submit to the Engineer this record of each driven pile, including length of piles, depth to which piles were driven, actual cut-off elevations, blow count per foot driven and for the last three inches driven and the calculated safe load.

SECTION 4A. CONCRETE BLOCK

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. MATERIALS:

Concrete hollow tile blocks shall be 8" x 8" x 16" nominal size, gray, two core type. Blocks shall conform to Federal Specifications No. SS-C-621, Class A.

a. Cement:

Portland Cement complying with ASTM Specification C-150, Type I or II.

b. Lime:

Hydrated lime complying with ASTM, Specification C-207.

c. Sand:

All sand shall be clean white, coral sand or #4 crushed rock sand.

d. Mortar:

One part cement, three parts sand, one part hydrated lime use promptly after mixing. Joints to be raked horizontally and vertically.

3. LAYING:

Concrete blocks shall be wet down with clean, fresh water and laid up in full beds of cement mortar, plumb true to line, bonded or keyed at intersections with suitable metal ties, cut accurately to fit around pipes and openings and all resultant voids slushed full with mortar outer and cross webs laid in full bed of mortar vertical joints buttered full with mortar. Blocks shall have joints 3/8" wide, with flush surface.

4. WALL REINFORCEMENT:

Concrete block shall be reinforced with 1-#5 vertical at all corners, jambs and 2'-8" maximum intermediate spacing, except as otherwise noted. Fill cells containing reinforcement solid with grout. Provide horizontal joint reinforcing at all sills and not more than 16" on center. All corners and intersections shall be tied as shown in the typical details. Provide dovetail masonry anchors at 16" on center at cold joints between concrete block and concrete columns or walls.

5. ANCHORS:

Set all anchors, bolts, metal nailing, inserts or wood nailing blocks, ties, clamps, etc.

6. CUTTING OF TILE:

Where necessary, do any cutting and fitting of tile work with masonry saw. All such cutting shall be accurate and neatly done.

SECTION 4B. STONEMWORK

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. MASONRY WALLS:

a. Rock:

Hard, clean, durable, free from seams or other imperfections, selected lava "puka puka" field rock, with a good range of colors.

b. Size:

One man size approximate minimum face size, 6" x 12" with average size 8 x 16"

c. Appearance:

Face and exposed edges of rock shall be natural, not broken or cut, and have a generous white moss coverage.

d. Selection:

The Contractor shall select the rock for the Designer approval before loading or hauling to the site.

3. MORTAR:

For bedding stone, mortar shall consist of one part by volume of Portland Cement ASTM C150-59 to two parts of clean, sharp sand, ASTM C33-59. The mortar shall be of such consistency that it can be easily handled and spread with a trowel. Mortar shall be used within one hour after mixing and shall not be retempered.

4. PLACING:

Stones shall be thoroughly wetted before placing and shall be laid in full mortar beds, in courses approximately horizontal in both longitudinal and traverse directions. Horizontal and vertical not be less than 1/4" and not more than 2" in thickness. Spaces between the backing stones shall be flushed with mortar and then packed with spalls; no voids in any part of the wall will be permitted. Masonry shall be kept moist and protected from the sun for at least three (3) days after placing. Faces of stone shall be kept clean at all times. Reinforce stones as shown on the drawings.

5.500 MISCELLANEOUS STEEL

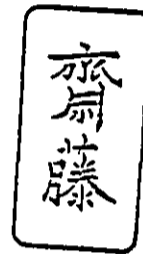
1. Provide all miscellaneous steel shapes and fabrications required for the project.
2. Shapes and fabrications of steel conforming to ASTM A-36 or A-283.
3. Piperaills of steel pipe conforming to ASTM A-120, schedule 40.
4. Exterior items shall be hot-dip galvanized ASTM A-123.
5. Shop prime all items with zinc dust-iron oxide primer on non-galvanized items and zinc dust-zinc oxide primer on galvanized items.
6. Items to include:
 - A. Steel pipe handrails
 - B. Ladders
 - C. Gratings
 - D. Pit covers and frames
 - E. Angles, channels, etc. as detailed.



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5.700 FABRICATED METAL SPECIALTY ITEMS

1. Aluminum Handrails: Isle Craft style #230 fabricated of bronze anodized aluminum.
 - A. Posts: 2" square tubular extrusions.
 - B. Bottom Rails: 1" x 1-1/2" W. tubular extrusions.
 - C. Top Rails: Continuous 2-1/2" x 1-1/2" extrusions.
 - D. Balusters: 1/2" square tubes.
2. Install railings in non-shrink grout or secure with anchor bolts as detailed.
3. Expansion Joint Covers: Prefabricated extruded natural color anodized aluminum units complete with lock-in filler strips, moisture seals, and vinyl gutters.
4. Protect aluminum from contact with dissimilar materials.



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SECTION 6A. CARPENTRY

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Carefully lay out, cut, fit and erect all framing. Secure with sufficient rough hardware to insure rigidity. Frame as required for the installation and support of plumbing and pipes, plumbing fixtures, paper holder, mirrors, and similar accessories. Install all work true to lines and dimensions, plumb and level unless otherwise shown. Check size and spacing of exposed members.

3. DAMPPROOFING:

All woodwork in contact with masonry shall be separated from the latter with a layer of 30# felt.

4. SHOP DRAWINGS:

Carpentry Contractor shall furnish four (4) sets of shop drawings showing millwork and all case work to be furnished for ~~Designer~~ approval before fabrication or erection. Millwork contractor to verify all dimensions and be responsible for this accuracy. No work shall be started prior to approval of shop drawings by ~~Designer~~.

5. WOOD TREATMENT:

All framing lumber, plates, blocking, etc., to be wolmanized. All cuts to be treated with toxic wood preservative. All millwork materials to be Penta-Treated. Where the words Penta-Treated are used in conjunction with a type of wood material, it shall mean a pressure treatment of material with a .30 lb. Penta net retention.

6. ROUGH HARDWARE:

Provide as necessary or as detailed for proper erection of framing and installation of carpentry and millwork. Sizes and quantities sufficient, as judge by the ~~Designer~~, to draw and hold members rigidly and permanently in place. Where sills and plates rest on concrete curb or walls, anchor bolts are to be set in concrete 6 feet on center and 6 inches from end to each sillpiece or as detailed. Nut and washer to hold plate.

7. FRAMING LUMBER:

Lumber to be nominal S4S Douglas Fir complying with the West Coast Lumbermen's Association "Standard Grading and Dressing Rules" Number 17, construction grade, kiln dried, and "Wolmanized".

8. PLYWOOD SHEATHING:

All floor sheathing to be 3/4" plywood Western Plywood Association (WPA) standard Grade with exterior glue unless otherwise noted. All sheets to carry WPA I.D. stamp 16/32. Min. nailing 8d at 6" o.c. at edges 10" o.c. intermediate unless otherwise noted.

9. PLYWOOD SIDING:

5/8" Texture 1-11, redwood, with rough sawn face. Grooves at 4 inches on centers. Penta treated, premium grade

10. FASCIAS AND TRELIS STRUCTURES:

Clear all heart redwood.

11. INTERIOR TRIM: (INCLUDING BASEBOARD)

Interior trim and base to be clear fir as detailed. Running trim furnished in commercial long lengths with minimum end joints. End joints, where required, made over bearing and closely fitted. Inside joints neatly coped, outside joints mitered. Where members stop without sufficient trim, return on shelf with miter or cope. Hardwood trim to be teak (including handrail).

12. DOOR AND WINDOW FRAMES:

Material to be clear Fir as detailed. Set plumb and square, thoroughly wedge into rough opening. Furnish solid backing back of butts and strikes.

13. SHELVING:

3/4" AB Douglas Fir plywood.

14. MILLWORK WORKMANSHIP:

- a. Use only thoroughly experienced craftsmen, skilled in their trades, under the supervision of a competent foreman for all work, both in the shop and at the building.
- b. Fabricate all work in strict accordance with detailed drawings, selecting materials with care, using best methods and quality of workmanship to assure finished products of highest quality.
- c. Sections shall be accurately run to details and all surfaces shall be clean cut and regular, without defects to produce a base for a mirror smooth finish.
- d. Take precautions necessary to protect all work and finish from damage during fabrication, until final acceptance.
- e. All finish wood shall be smoothly dressed and belt-sanded before assembling in the work. Prior to finishing, all hardwood shall be hand-scraped and hand-sanded to obtain perfect base for finishing. Any material showing machine sand-paper or other defacing marks will be rejected.

SECTION 6B. CABINET WORK

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. SCOPE:

Furnish all labor and materials, tools, and equipment necessary to furnish and install all kitchen and lavatory cabinet work, as shown on the drawings and as specified herein.

3. WORK SPECIFIED IN OTHER SECTIONS:

a. Finished wood base specified under CARPENTRY SECTION.

4. MATERIALS:

a. Cabinet Body and Shelves:

5/8" prime coated particle board

b. Face Frames:

3/4" vinyl wrapped pine. Width as indicated on the drawings.

c. Drawers:

Faces to be 5/8" particle board covered two (2) sides with vinyl. Sides and back to be 1/2" prime coated particle board. Bottoms to be 1/8" tempered hardboard.

d. Counter Tops: (Kitchen only)

To be 1/16" Formica, Wilson Art or Lamin Art, laminated plastic. Pattern and color as selected. Hardwood edging to be teak hardwood as detailed.

e. Doors:

To be 5/8" particle board, covered two sides with vinyl.

f. Exposed End Panels:

To be 5/8" particle board covered with vinyl.

g. Counter Tops: (Lavatory only)

To be "Corian" as manufactured by E.I. duPont de Nemours & Co., size as shown on the drawings.

h. All vinyl to be simulated "teak".

5. CABINET HARDWARE:

a. Drawer Guides:

KV 1175 single-track under-drawer slide.

b. Hinges:

Ajax #593 self closing, semi-concealed hinges or equal.

6. WORKMANSHIP:

a. Workmanship shall conform to the "Architectural Woodwork Quality Standards" of the American Woodwork Institute, economy grade.

b. Drawer sides and shelves to have vinyl channel edges.

c. Drawer and door edges to have reverse bevel, filled and stained to match face finish.

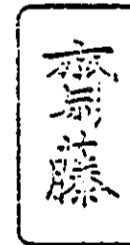
d. Verify all field dimensions before fabrication.

7. SUBMITTALS:

a. Submit complete cabinet shop drawings, vinyl surfacing samples, and laminated plastic samples before fabrication.

6.300 WOOD TREATMENT

1. All wood shall be preservative treated either with Termite Preservative or Fire Retardant Preservative. All heart redwood and cedar do not require termite treatment, but will require fire retardant treatment where scheduled.
2. Wood preservative treatment shall be by a licensed wood treatment contractor, either Chemwood Treating Company, Hawaii Wood Preserving Company, or Honolulu Wood Treating Company.
3. Termite Preservatives:
 - A. All framing and general use lumber and plywood that will be concealed in the finish work shall be pressure treated with Wolman salts or Osmose salts complying with AWPB LP-2.
 - B. All exposed lumber 2" nominal thickness and over shall be unincised and pressure treated with pentachlorophenol complying with AWPB LP-3.
 - C. All exposed lumber under 2" nominal thickness shall be immersion treated with water repellent penta in accordance with WIC requirements.
4. Fire-Retardant Preservative Treatment: "Non-Com" as manufactured by Koppers Company, Inc., with termite preservative added, or "Flamort WC" as manufactured by Flamort Chemical Company, San Francisco, or approved equal. (Where "Flamort" treated wood is to come in contact with metal subject to corrosion, use "Flamort WCC.") Each piece shall bear a U.L. label "FR-S".
5. Kiln dry treated materials to 19% for framing lumber and 15% for finish lumber.
6. Cuts of treated wood shall be given field coating of preservative used in treatment.

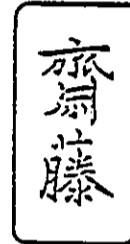


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6.400 ARCHITECTURAL WOODWORK

1. Provide all items of Architectural Woodwork including but not limited to cabinets, wall paneling, ceiling paneling, and trims and designed for the following areas:
 - A. Coffee Shop
 - B. Specialty Restaurant
 - C. Nite Club
 - D. Main Dining
 - E. Retail Shops
 - F. Main Lobby
 - G. Registration and Bell Boy
 - H. Ballroom
 - I. Meeting Rooms
 - J. Gallery
 - K. Lobby Lanai
 - L. Elevator Lobbies

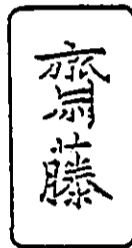
2. All items of Architectural Woodwork to be part of an allowance to be negotiated with the Owner.



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6.610 SYNTHETIC MARBLE

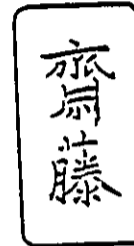
1. Countertops with integral lavatory: 3/4" thick "Corian" with oval lavs, 4" high backsplash where indicated, and apron panels where required. Colors as selected.
2. Countertops with integral bar sink: 3/4" thick "Corian" with 12" x 10" x 6-3/4" deep sink, 4" high backsplash and sidesplash where indicated. Color as selected.
3. Tub Surrounds: 1/4" thick "Corian" tub surround system with trim pieces. Color as selected.
4. Installation of "Corian" in strict accordance with the manufacturers instructions, complete with all joints sealed with approved sealant.



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7.010 WATERPROOFING AND DAMPROOFING

1. System for either waterproofing or damproofing shall be Johns-Manville Specification No. WP-1, or equal.
 - A. Waterproofing - 3 layers of felts in hot application asphalt or 2 layers of felts in cold application method.
 - B. Damproofing - 1 layer of felt in either hot or cold application method. Use for planters and elsewhere as noted.
2. Provide protection board of 1/4" J.M. Flexboard, or equal, over all systems.
3. Provide 2 year guarantee against leakage.



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7.210 BUILDING INSULATION

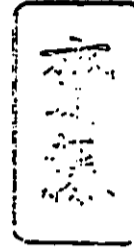
1. Acoustical Spray-On Insulation: National Cellulose Corp. "K-13", Therma-Coustics Mfg. "TC1-75", or equal. Install where indicated in strict conformance with the manufacturers installation instructions.
2. Asphaltic Roof Fill: Vermiculite of Hawaii "Insulpave", or equal. Install to slopes indicated in strict conformance with manufacturer's instructions.
3. Roof Insulation: Johns-Manville "Fesco-Foam C-10", or equal. Installation shall comply with the requirements of the built-up roof system specified in Section 7.510.



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7.400 PREFORMED ROOFING

1. Roofing to be Kaiser Aluminum "Zip-Rib" prefinished aluminum roofing. Sections to be 16" wide by length required to cover span in a single section. Standing seams 2-1/2" high, mechanically locked, and anchored with concealed clips fastened to deck. Color as selected.



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7.510 BUILT-UP BITUMINUOUS ROOFING

1. Roofing to be four ply system of asbestos felts over insulation with a gravel surface. Johns-Manville Specification No. 631-1, or approved equal.
2. Install flashings in accordance with Johns-Manville Specifications to suit conditions.
3. Provide minimum 2 years guarantee.



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SECTION 7A. SHEET METAL WORK

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

Furnish all labor, materials, tools and equipment necessary to furnish and install all sheet metal gutters, strainers, leaders, downspouts, flashings and batten seam fascia as shown on the drawings and as specified herein.

- a. Furnish and install gutters, strainers, leaders, downspouts, termite shields, flashings and batten seam fascia.

3. MATERIALS:

- a. All materials shall be stored in such a manner as to afford adequate protection. Damaged material shall not be used, but shall be removed from the site and replaced with new materials.
- b. All sheet metal for gutters, batten seam fascia and accessories shall be 16 ounce cold rolled copper.
- c. All sheet metal for termite shields and flashings shall be 26 gauge galvanized iron.
- d. Solder shall be 50% lead and 50% block tin, new metal, conforming to ASTM B-32.
- e. Flux for soldering shall be muriatic acid "killed" with zinc, or shall be an approved brand of soldering paste.
- f. Plastic cement shall conform to Federal Specification SS-C-153.
- g. Nails, cleats, rivets, fastenings, straps, etc., for gutters, downspouts, and batten seam fascia shall be copper or brass.

4. WORKMANSHIP:

- a. Workmanship shall conform to the quality, procedures and the methods recommended by the National Association of Sheet Metal Contractors. Sheet metal work shall be accurately formed, fitted snugly against the walls, have exposed edges folded under at least 1/2 inch and have no sharp corners left exposed. Materials shall be properly shielded against galvanic action with either an asphalt base paint or an equivalent.

The work shall be securely fastened and shall be absolutely watertight. Adequately provide for expansion and contraction.

- b. Inspect surfaces to which flashing and other sheet metal is to be applied to determine that such surfaces are smooth, properly prepared and have adequate provisions for fastening metal into position.

- c. Clean all surfaces before soldering. Soldering shall be performed slowly with well heated tools so as to thoroughly heat the sheet and completely sweat the solder through the full width of the seam. All lock seam work shall be flat and true to line and be sweated full of solder. All flat lock seams, and lap seams, where soldered, shall be at least 1/2 inch wide. Lap seams, not soldered, shall lap according to the pitch but in no case less than three (3) inches.
- d. All flat and lock seams shall be made in the directions of the drainage flow. Thoroughly wash all acid flux work after soldering.
- e. Clean all surfaces which will be concealed after installation, carefully removing grease and oil with solvent or gasoline and wiping with clean rags.
- f. Protect all surfaces to prevent damage to the sheet, and install without etching or priming.
- g. Wherever possible, secure metal by means of cleats without nailing through metal. In general, space nails, rivets or screws not more than eight (8) inches apart, and where exposed to the weather use lead washers.
- h. Join parts with concealed rivets where necessary for strength or stiffness. Place sheets together before drilling. Where lap joints are used, lap sheets at least four (4) inches.
5. GUTTERS:
Shall be 16 ounce copper as detailed in the drawings.
6. DOWNSPOUTS:
Shall be copper DWV piping.
7. SHOP DRAWINGS:
Submit six (6) copies of shop drawings to the Engineer for approval prior to fabrication.
8. GENERAL REQUIREMENTS:
- a. Inspection: Before completing the work, the Contractor shall carefully examine and, if necessary, test all sheet metal work and equipment specified herein and the Contractor shall make all repairs to the work if damaged, leaving it in a condition satisfactory to the Designer.
- b. Cleaning: All sheet metal work shall be cleaned of flux.
9. CLEAN-UP:
On completion of this work, remove all debris and excess materials, tools, etc., resulting from this work from the jobsite and leave the location of the work broom-clean.

10. GUARANTEE:

The Contractor shall issue a written guarantee to the Owner that all work executed under this section shall be free from defects of materials and workmanship for a period of two (2) years from final acceptance of the building. The following types of failure will be adjudged as defective work: leaking, failure to stay in place, undue expansion, lifting, deformation, loosening, splitting of seams.

7.810 SKYLIGHTS

1. Pyramidal Dome: Lane-Aire series P, Plasteco series 121, Wasco series P1, or equal, double domed aluminum framed skylights in sizes as indicated. Outer dome to be pyramid shaped transparent bronze acrylic. Inner dome to be bubble type translucent white acrylic. Aluminum framing to be bronze anodized, self venting type, for installation on wood curbs.
2. Segmented Skylights: Skylight units fabricated by Super Sky, Inc., or equal. Units shall have bronze anodized aluminum frames double glazed. Outer glazing to be flat transparent bronze acrylic. Inner glazing to be translucent white acrylic.
3. Skylight installation to conform to manufacturer's instructions.



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7.820 ROOF HATCHES

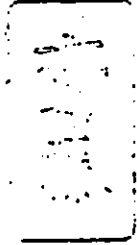
1. Provide roof hatches of size and design selected as manufactured by Bilco, Inland Ryerson, or equal.
2. Install hatches integrally with roof flashing and built-up roofing work. Installation shall conform to manufacturer's installation instructions.



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7.900 JOINT SEALING

1. Interior joints: Oleo-Resinous caulking compound with oakum back-up filler for joints with zero movement as manufactured by W.R. Grace, Sonneborn, Tremco, or equal.
2. Exterior vertical joints and vertical expansion joints: One or two component Polysulfide sealant, non-sag type, with preformed back-up filler compatible with sealant. Sealants as manufactured by Products Research and Chemical, Sonneborn, Tremco, or equal.
3. Horizontal joints in deck and paving, interior and exterior: Two-Component Polyurethane sealant, self leveling type, with preformed back-up filler compatible with sealant. Sealants as manufactured by Products Research and Chemical, Sonneborn, Tremco, or equal.
4. Guarantee all joint sealing to be watertight for a minimum of 3 years.


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SECTION 7C. SHAKE ROOFING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Shakes shall be as graded by the Red Cedar Shingle and Handsplit Shake Bureau and shall be No. 1 Handsplit and Resawn, 24" x 1/2" to 3/4".

3. INSTALLATION:

All installation of shakes be according to the Application Recommendations published by the Red Cedar Shingle and Handsplit Shake Bureau for Roof Applications.

Shingles shall be installed with a 10 inch exposure to weather.

SECTION 7D. CAULKING AND SEALANTS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Provide water-tight and draft-tight caulked joints at all locations where possible penetration through joint may occur. Make sure all surfaces are clean and dry before application of caulking. Immediately clean adjacent soiled surfaces.

3. MATERIALS:

Sonneborn "Kaukit" or Grace "Vulcatex". Apply according to manufacturer's specifications by gun with appropriate sized nozzle for joint being caulked.

SECTION 8A. SLIDING GLASS ALUMINUM DOORS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Sliding aluminum doors to be Arcadia Series 700 as manufactured by Northrop Architectural Systems. Model No. 711.

3. MATERIALS:

Basic frame and sliding sections shall be aluminum extrusions of 6063-T5 alloy. Component parts to be aluminum alloy, stainless steel or non-metallic materials which will not deteriorate or promote corrosion. Weatherstripping shall be silicone-treated, woven polypropylene pile, glazing channel shall be extruded "Geon" vinyl.

4. CONSTRUCTION:

Interlockers and stile members shall be of a cross section to adequately resist operating forces and wind-load. Corner joint to be self-aligning, rigid and watertight. Sliding panels to be bottom rolling on nylon sheaves having sealed ball bearings. Both sliding and fixed panel shall be removable. The fixed panel shall be held in position at both top and bottom of the unit at the center of the frame. The sliding panel when in a locked position shall not be removable from the outside. Door track shall be capped with extruded black nylon.

5. FINISH:

All aluminum member of the door and screen to receive Arcadia "Colornodic No. 83 Dark Bronze" finish.

6. PULLS AND LATCHES:

Sliding panel to be equipped with a non-jamming concealed-in-stile latch. Pulls shall be extruded aluminum with black vinyl inserts.

7. GLAZING:

The fixed and sliding panels shall be constructed to allow for 1/4" single glazing and shall be furnished with "Geon" vinyl glazing channel.

8. WEATHERTIGHTNESS:

Window to be weather sealed to meet AAMA Specification SGD-A2.

9. SCREENS:

Sliding screens to be provided on all sliding aluminum doors, and shall be bottom rolling on adjustable nylon sheaves. Basic screen sections shall be made of roll formed aluminum alloy. Mesh to be 14 x 18 vinyl coated Fiberglass mesh. A vinyl insect closure shall be provided on the tailing stile. Screen to have inside latch and pulls.

SECTION 8B. GLASS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Cut glass to proper size. Set glass with equal bearing along edges. Leave all glazing smooth and clean with exterior glazing water-tight. Take all required measurements on the job and be responsible for same. Leave glass whole, free from scratches or roughness at time of final acceptance.

3. MATERIALS:

a. Manufacturer:

All glass shall be Libby-Owens, Ford or **Designer** approved equal.

b. Labeling:

Each sheet of glass shall be factory labeled.

c. Glass:

All glass, doors and windows shall be 1/4" tempered grey glass, or as called for on the drawings.

SECTION 8C. JALOUSIE WINDOWS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Furnish all materials, labor, and equipment necessary to install complete, all jalousie windows and screens except as noted below.

3. WORK SPECIFIED IN OTHER SECTIONS:

Caulking of wood frames is specified in CAULKING Section.

4. MANUFACTURER:

Materials and construction shall be as specified hereinafter and shall be manufactured by the following manufacturers or Designer approved equal.

- a. Aluminum Products - Hawaii, Ltd. "Haleakala".
- b. Acker and Acker Mfg. Company "Visualite" 505M.
- c. Hawaii Metal Forming Corp. Model 800.
- d. International Aluminum Corp. "Louver Queen" with #195-1 lever operator.

5. MATERIALS AND CONSTRUCTION:

- a. Product - Jalousies shall be the aluminum "surround" type, jamb only, and shall be the standard product of one manufacturer.
- b. Jalousie window frames shall be extruded aluminum sections of 6063-T5 alloy. Frame members shall be not less than 2-1/2" deep and shall be .075" thick with an extrusion tolerance acceptable to the trade of plus or minus .006".

Minimum jamb thickness at the clip attachment shall be .100", and jamb shall be one continuous piece.
- c. Push bar shall be 6063-T5 aluminum alloy, 5/8" wide x 3/32" thick or 1/2" wide x 1/8" thick.
- d. Operator lever arm and connecting bar shall be heavy duty type, 6061-T6 aluminum alloy, or other hard tempered aluminum alloy with a minimum thickness of 1/8" as approved by the Designer. All pivotal points of the operator lever arm and connecting bar shall have rivets or bolts of 1/4" diameter of anodized aluminum or 300 series stainless steel. Operator shall be made detachable for repair. The use of sheetmetal screw fasteners will not be acceptable. Operator lever arm housing, if not integral with frame, shall be secured to it with either heavy duty rivets or bolts and nuts with lock washers. Jalousie pole shall be 5/8" Ø, standard with manufacturer, in locations as indicated on the window schedule.

- e. Weather stripping shall be extruded plastic vinyl, designed so that when vanes are closed a weatherproof closure is attained on sides of the window opening. Mohair is not acceptable for weather stripping.
- f. Glass vane to be 7/32 glass with weberized edges. Clear or obscure as indicated on the drawings.
- g. All aluminum parts, including frame, clips, rivets, lever, jalousie pole, push bar, screen frames, etc. shall be anodized dark bronze to a minimum thickness of .0004".
- h. Absolutely no dissimilar metal shall be used except at specifically permitted and spelled out in this specification.
- i. Provide fiberglass mesh screens with aluminum to match jalousie hardware.

6. INSTALLATION:

- a. All jalousie windows shall be installed in accordance with manufacturer's instructions in workmanlike manner by skilled workers. Wood vanes shall be cut to exact lengths (not short) to fit snugly into jamb clips. Holes drilled into push bar for connection of connecting bar shall be drilled accurately. All shoddy workmanship shall be subject to rejection by the Architect.
- b. Where jalousie frame is attached to wood frames, screws shall be aluminum or cadmium-plated screws at 18" o.c.

7. GUARANTEE:

The Jalousie Supplier shall execute to the Owner a two-year written guarantee countersigned by the General Contractor covering all material and workmanship to be free from all mechanical defects not due to improper use or willful damage or neglect and guarantee free operation of this jalousie under any normal Hawaiian weather condition. He will make good, repair or replace without cost to the Owner any defective equipment, parts and workmanship that may occur within a period of two years from date of acceptance of installation.

SECTION 8D. WOOD DOORS

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

All work shall be done in a workmanlike manner in accordance with the best practices of the trade.

3. INSTALLATION:

- a. Trim and fit doors accurately.
- b. Dress equally on both sides to preserve maximum thickness of facing strip.
- c. Fit snugly without binding, approximately 1/16" clearance, head and each side, before finishing.
- d. Fit hardware for doors so that they will close without forcing and not rattle.
- e. Hardware cuts true and neat.
- f. Doors may be U.S. Plywood, Simpson or other Architect approved stock.
- g. 1-3/4" doors to be solid core.
- h. 1-3/8" doors to be hollow core.
- i. All door surfaces to be Mahogany Veneer

4. SPECIAL DOORS:

- a. Full louvered glass jalousie doors to be Bel-air Door Company, Huntington Series.

SECTION 9A. FINISH HARDWARE

1. GENERAL CONDITIONS:

As specified in section 1A.

2. GENERAL:

- a. The work included in this section of the specifications shall provide for the furnishing and delivering to the building site, all finishing hardware required for all doors, casework, etc., complete as shown and specified hereinafter.
- b. It is the intent of these specifications to cover in general the class and character of all finish hardware required.
- c. The hardware list specified hereinafter has been made for the convenience of the Contractor and covers in general the necessary hardware for doors, casework, etc., but all other doors, etc., requiring finishing hardware shown on the plans and not covered by the general characterization shall be fitted with appropriate hardware of the same standard as the hardware described throughout these specifications.

3. DELIVERY:

All hardware shall be delivered at the site, packed separately with all trimmings, screws, etc., for the particular item or door, all properly labeled and numbered so that they can be checked with the hardware list which shall be furnished with the goods when delivered.

4. REPRESENTATIVE:

Provide service of a competent hardware specialist who is familiar with installation and operation of all finishing hardware items furnished hereunder who shall be subject to call from the Designer, to direct application and final adjustment of finishing hardware.

5. GENERAL CHARACTER:

- a. All hardware shall be of the best quality in construction, design and finish and free from any defects. Any defective pieces shall be replaced by the Contractor at his own expense.
- b. Hardware shall be of the manufacture, type, weight function and quality as shown by the factory numbers or an approved equal.

6. GENERAL REQUIREMENTS:

- a. Suppliers proposing substitutions of equivalent products of other than the manufacturers named hereinafter shall submit schedules listing the product and manufacturer specified and the product and manufacturer of the proposed substitute. Refer to Special Provisions governing substitutions.

- b. Lockset strikes shall be furnished in accordance with the American Standard Association, Inc., Specifications for 1-3/8" and 1-3/4" doors. Knobs shall be of screwless type, free from set screw adjustment.

7. FASTENINGS:

- a. Furnish necessary screws, bolts and other fastenings for proper application of hardware. Fastenings shall be of suitable size and type to securely install hardware for heavy use.
- b. Fastenings must harmonize with the hardware as to material and finish.
- c. Furnish necessary expansion shields, "rawl" plugs, toggle bolts, machine or wood screws or other suitable approved anchoring devices where hardware is to be installed on concrete, masonry or other types of backing.

8. FINISH:

Except where otherwise specified, finish of all hardware shall be oil rubbed bronze US10B. Butts shall be prime coated for painting. Door closers shall be furnished with an enameled finish to match hardware.

9. KEYING:

Locks shall have two (2) keys each. Locks for the same room or group of rooms shall be keyed alike and master keyed as directed. Furnish three (3) sets of master keys for the building. Certification of factory assembly of all locks and cylinders as well as factory master keying shall be furnished to the Architect prior to final acceptance of this portion of the work.

10. SCHEDULE:

Furnish six (6) copies of schedule of hardware in compliance with specifications and drawings. List each opening and hardware to be applied. State keying, materials, finish and manufacturer's number for each item. Required types are listed. Schedule of hardware shall be approved by the Designer before any item is fabricated or ordered.

11. SCHEDULE OF FINISHING HARDWARE:

The hardware numbers in the following schedule of typical requirements are taken from the catalogs of the following companies to show style and quality standards required:

McKinney Manufacturing Company	M
Schlage Lock Company	Sch
Builders Brass Works	B
P & F Corbin	C
Ives Manufacturing Company	I
Acme	A
Stanley Hardware	S

HW #1

Pair Doors D-1, D-18 and D-23 From Storage:

3 Pairs	Hinge 2714-P-BR 3-1/2 x 3-1/2	M
1	Lockset A52PD Orbit 10B	Sch
1	Chain Bolt 1055 3" US4	S
1	Foot Bolt 1056 3" US4	S
2	Stops 8061 10B	B

HW #2

Doors D-2, D-2A, D-12, D-12A, D-16, D-16A, D-22 D-22A, D-24, D-24A, D-33 and D-33A:

Hardware furnished complete by Door Supplier

HW #3

Sliding Doors D-3, D-6, D-8, D-10, D-25, D-28, D-29 and D-32 From Closets:

1 Set	O.H. Sliding Door Hardware 8900	A
2	Flush Pull 225-B 10B (per door)	I

HW #4

Single Doors D-4, D-4A, D-5, D-5A, D-7, D-7A, D-11, D-11A, D-26, D-26A, D-27, D-27A, D-30, D-30A, D-31, D-31A To Bedrooms and Baths:

1 Pair	Hinge 2714-P-BR 3-1/2 x 3-1/2	M
1	Lockset A-40S Orbit 10B	Sch
1	Stop 64A10	I

HW #5

Single Doors D-9, D-9A, D-14, D-14A, D-15, D-15A, D-20, D-20A, D-21, D-21A To Storage, Closet and Pantry:

1 Pair	Hinge 2714-P-BR 3-1/2 x 3-1/2	M
1	Latchset A10S Orbit 10B	Sch
1	Stop 64A10 (as required)	I

HW #6

Single Doors D-13, D-13A, D-17, D-17A To Apartments:

1-1/2 Pair	Hinge 2714-P-BR 4-1/2 x 4-1/2	M
1	Lockset A52PD x 11-096 Orbit 10B	Sch
1	Stop 64A10	I
1	Chain Door Guard 481B 10B	I

HW #7

Single Doors D-19, D-19A From Kitchen:

1-1/2 Pair Hinge 2714-P-BR 4-1/2 x 4-1/2 NRP
1 Lockset A52PD Orbit 10B
1 Stop 8063 10B

M
Sch
B

HW #8

Pair Doors D-34 From Electric Meter Room:

3 Pairs Hinge 2714-P-BR 3-1/2 x 3-1/2
1 Deadlock 423 10B
1 Chain Bolt 1055 4" US4
1 Foot Bolt 1056 4" US4
2 Stop 8061 10B
1 Dummy Knob A170 Orbit 10B

M
C
S
S
B
Sch

HW #9

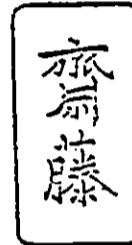
Misc.

3 Shelf Brackets 7045
Master Keys

S
Sch

8.400 ENTRANCES AND STOREFRONTS

1. Aluminum: Frames, stiles, and rails of storefronts and doors to be alloy 6063-T5 with bronze anodized finish. All joints to be reinforced. All fasteners compatible with aluminum and colored to match frames. Protect all aluminum from contact with dissimilar materials.
2. Storefront: Kawneer Series "Tri-Fab 450".
3. Doors: Kawneer Series 190 complete with all hardware including pivot hinges, concealed closers, push-pulls, and lockset less cylinder.
4. Prepare units with vinyl glazing stops to receive 3/16" or 1/4" glass as scheduled.



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8.800 GLAZING

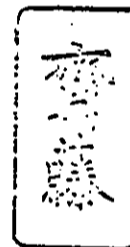
1. Provide all glass except for jalousie windows. Conform to requirements of the Consumer Product Safety Commission Standard 16 CFR 1201 where applicable. Thickness as scheduled.
2. Manufacturers: Glass shall be as manufactured by P.P.G., C.E. Glass, and L.O.F., or approved equal.
3. Float Glass: 3/16" or 1/4" thick clear float glass.
4. Tempered Glass: 3/16" or 1/4" thick clear float glass, tempered to conform to CPSC Standards.
5. Wire Glass: 1/4" thick clear polished "MISCO" conforming to U.L. and CPSC Standards.
6. Mirrors: 3/16" thick clear float glass with copper plated back and polished edges.
7. Provide glazing blocks, gaskets, compound, etc. as required to install all glass materials. Glazing gaskets provided with any frame shall be utilized.



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9.100 LATH AND PLASTER

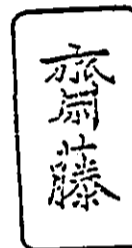
1. Plastering work shall conform to "Specifications for Metal Lath and Furring" of the Metal Lath Association, recommendations of the National Bureau of Lathing and Plastering and recommendations of the Portland Cement Association.
2. Metal Framing:
 - A. Walls: Steel studs provided by Section 9.250. Furring to be 3/4" cold rolled steel channels. Galvanized at exterior.
 - B. Suspended Ceilings: 1-1/2" cold rolled steel carrying channels and 3/4" cold rolled steel furring channels suspended on 8 ga. hanger wire. Galvanized at exterior.
3. Metal Lath:
 - A. Exterior (and as backing for ceramic tile): Galvanized type SFB (AK) self furring "Aqua K-Lath" or equal.
 - B. Interior: Type F-FB (SPG) expanded diamond mesh "K-Lath" or equal.
4. Lathing Accessories: Casing beads, corner beads, expansion joints, and screeds as required. Galvanized at exterior.
5. Plaster Materials:
 - A. Portland Cement: ASTM C-150.
 - B. Gypsum Plaster: ASTM C-61.
 - C. Acoustic Plaster: Cafco "Sound-Shield 85" or equal.
 - D. Lime: ASTM C-5 or C-206.
 - E. Sand: ASTM C-35 and C-144, #4 to #100 Sieve.
 - F. Bonding Agent: "Thorobond" or equal.
6. Application Methods:
 - A. Gypsum and Cement Plaster on Metal Lath: 3 coat work. Finish coat texture as selected.
 - B. Gypsum and Cement Plaster on Concrete and C.M.U.: Bonding agent with "double-up" coat of plaster. Finish texture as selected.
 - C. Cement Plaster on Metal Lath Backing for Ceramic Tile. 2 coat work ready to receive ceramic tile setting bed.



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9.250 GYPSUM WALLBOARD

1. Drywall work shall conform to ANSI Standard A97.1 "Standard Specifications for the Application and Finishing of Wallboard".
2. Metal Framing:
 - A. Studs: 20 and 25 gage galvanized steel channel shaped studs for screw attachment as manufactured by United States Gypsum, or equal.
 - B. Ceiling Carrying Channels: 1-1/2" cold rolled steel carrying channels suspended on 8 ga. hanger wire.
 - C. Furring Channels for Walls and Ceilings: 7/8" deep, roll-formed, hat shaped, galvanized steel, designed for screw attachment of wallboard.
3. Accessories: Corner beads, casing beads, and expansion joints of galvanized steel. Provide as required.
4. Drywall: As manufactured by United States Gypsum, or equal.
 - A. Fire Rated (Type 'X'): Sheetrock SW Firecode.
 - B. Water Resistant: Sheetrock W/R Firecode 'C'.
 - C. Exterior Soffits: Exterior Gypsum Ceiling Board.
 - D. Solid Gypsum Shaft Walls: Core of 1" thick "Coreboard".
5. Application: Apply wallboard with screws and tape joints in accordance with ANSI A97.1.



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SECTION 9C. CERAMIC TILE

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Tile shall equal or exceed Standard Grade requirements of U.S. Department of Commerce Simplified Practice Recommendation R61-61. All containers shall be grade-sealed in accordance with minimum grade specifications as described in SPR-R61-61. Deliver containers to site with seals unbroken. Provide all necessary shapes of tile and trim required. All joints must align; no warped tile or seconds permitted. All external corners and vertical and horizontal edges be bull nose.

3. MATERIALS:

- a. Wall Tile, shall be "American Olean", "Interpace" or "Romany Spartan" glazed wall tile 4-1/2 x 4-1/2 x 1/4 inches thick mat glazed, modified square edge, of color to be selected. Imported tile of similar quality is approved. Color as selected from Group I.
- b. Grout: Waterproof non-staining grout certified by manufacturer as suitable for intended purpose. Tile-Mate Drywall Grout by Interpace or Dry Supreme Grout by Mosiac is approved. Grout color to be selected.
- c. Organic Adhesive: Water resistant type per commercial standard CS181. Use for installing glazed wall on walls at all locations.
- d. Soap Dish: (1 per bath tub) - Ceramic flange type combination soap holder and towel rail.

4. INSTALLATION:

- a. Apply tile to a height as indicated on the drawings with adhesives and grouts in strict accordance with manufacturers printed instructions.
- b. Remove all material and debris from each unit as soon as work is completed. Protect bath tub from stains and damage. Sponge and wash thoroughly; tub with non-staining, non-scratching materials. Clean grout and foreign matter from tile surfaces. Use no acid or any ceramic materials.
- c. Caulking at intersection of tub and ceramic tile by tile installer.

SECTION 9D. RESILIENT FLOORING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Furnish and install all resilient sheet and tile flooring and base. See Schedule of Finishes on the drawings for locations and extent of floor covering.

3. MATERIAL:

Vinyl Asbestos:

Johns-Manville, Flintkote, Kentile, Armstrong, Ruberoid, or approved equal, 3/32" thick, 9" x 9" or 12" x 12" color as selected from travertine pattern.

4. APPLICATION:

Install in exact accordance with manufacturer's recommendations for primer, adhesive cement, and method of application. Lay the tile with tight joints in true alignment across the floor. Cut material neatly and accurately to effect tight fits against vertical surfaces, around pipes, and all other places; leave no space for dirt to collect. At all such places, a tight seal shall be made by the cement. Make joints of the tile as inconspicuous as possible, and all surfaces smooth, straight and free from buckles, waves or projecting edges. Immediately remove any spots or smears of cement, before it has had time to set. Grain of all tile to run parallel.

5. CLEANING AND POLISHING:

Clean with a damp mop. Do not wash or scrub for at least 4 or 5 days after installation. Protect floor with building paper as necessary. On total completion of building, thoroughly clean tile surface with mild soap and water.

SECTION 9E. SEAMLESS DECK COATING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

Furnish and install all seamless waterproof deck coating. See finish schedule on drawings for locations and extent of floor covering.

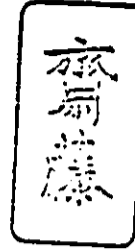
3. MATERIAL:

Liquid urethane coating: Urabond 835-S Hawaiian Beige as manufactured by Urabond Poly Resins or approved equal.

4. APPLICATION:

Install in strict accordance with manufacturer's recommendations for method of application. All surfaces to receive deck coating must be smooth, clean, and free of dust, grease or any other foreign matter. All cracks and joints must be routed out to a minimum depth and width of 1/4" then filled with a paste sealant, Urabond 837 or approved equal.

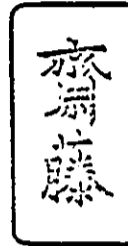
9.500 ACOUSTICAL TREATMENT



1. Acoustical Tile (Ceiling Material G):
 - A. Grid: Chicago Metallic System #450, fire rated concealed grid, or equal. Mark Saito
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 - B. Tiles: Armstrong "Sanserra" design #571, square edged, 12" x 12" x 3/4" tiles, or equal.
2. Acoustical Tile (Ceiling Material H):
 - A. Grid: Chicago Metallic System #550, fire rated exposed 'T' grid, or equal.
 - B. Tiles: Armstrong "Georgian" design #764, lay-in, 24" x 24" x 5/8" tiles, or equal.
3. Vinyl Face Acoustical Tile (Ceiling Material J):
 - A. Grid: Chicago Metallic System #550, fire rated exposed 'T' grid, or equal.
 - B. Tiles: Armstrong "Design 'E' " design #884, lay-in mylar faced, 24" x 48" x 5/8" tiles, fire-resistive, or equal.
4. Install grids and tiles in strict accordance with the manufacturer's instructions.

9.550 WOOD FLOORING

1. 3/4" thick solid hardwood, prefinished, flooring for adhesive application to concrete slab. Species of wood, design, and color to be selected.
2. Preservative treat flooring as specified in Section 6.300.
3. After installation, give floor a coat of buffing wax as manufactured by Hillyard, Johnson, Minwax, or equal.



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9.650 RESILIENT FLOORING

1. Vinyl Asbestos Tile: Federal Spec. SS-T-312, Type IV, 12" x 12" x 1/8" thick, premium grade. Color and pattern as selected.
2. Sheet Vinyl Flooring: Armstrong "Montina" or equal, with wear layer .050" thick and overall thickness .090". Color and pattern as selected.
3. Vinyl Base: Topset cove or carpet type, 1/8" thick, with premolded exterior and interior corners.
4. Installation to be with adhesive of type recommended by manufacturer of resilient materials.
5. After installation, give V.A.T. one coat of buffing wax.



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9.750 BRICK FLOORING

1. Flooring shall be 4" x 8" x 3/4" thick brick paving units as manufactured by whitacre-Greer, or equal, color as selected.
2. Install pavers in accordance with the Tile Council of America, Inc. "Handbook for Ceramic Tile Installation" 1978 edition, in a mortar bed over prepared concrete slab.



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SECTION 9F. PAINTING

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

All paint and paint ingredients shall be brought onto the premises in sealed, unbroken packages. All mixing must be done outside the building and all materials kept there. Before starting on the work, the painter shall examine all work to be painted. Application of the first coat shall constitute acceptance of the surface by the painter. No work shall be done until all surfaces are clean, dry, smooth and free from dust, dirt, grease, etc. Each coat shall be allowed to dry thoroughly before the next coat is applied. All paint shall be applied with brush; no spraying will be allowed. All finished work by skilled painters. No exterior work to be done in rainy weather. Knots or pitch pockets shall be treated with shellac. Nail holes, cracks, etc., puttied after the first coat. Color of putty to match paint. Upon completion of the work, the Contractor shall remove all paint spots from the hardware, floors, walls, etc., and shall leave the entire premises free from rubbish and repair all damages. Unless particularly specified by the manufacturer, only pure linseed oil and gum spirits or turpentine shall be used for thinning purposes. Compound thinners, mineral oil, kerosene or gasoline shall not be used for storing or cleaning brushes or containers. All surfaces, regardless of material or condition of priming coats applied by others, shall be properly prepared for the finishes specified hereinafter. All surfaces woodwork to receive stain shall be thoroughly sanded and all collected dust, etc., shall be removed before applying coats, and shall include all the sanding between coats.

3. MILDEWCIDE REQUIREMENTS:

All finish coats must contain a mildewcide. It shall represent approximately 0.2% Phenyl Mercuric Oleate. These fungicidal ingredients are to be not less than: Active; Phenyl Mercuric Acetate 00.16% and Inert; 99.84%. Any substitute fungicidal ingredients other than those listed must have mildewcide properties equivalent to the before mentioned properties. Fungicidal ingredients must be included at the point of manufacture and so stated on the container label.

4. TREATMENTS:

The following are various kinds of finishes or treatments which are to be applied. The use of other products or equal quality and matching color of other manufacturers may be substituted, if such substitution is approved in writing by the Designer.

Treatment No. 1 - Apply to all concrete block.

Two coats - Mixture of 50% Olympic Stain and 50% Thompson Waterseal.

Treatment No. 2 - Apply to all galvanized metal.

One coat - Moore's Retardo Primer.

Two coats - Moore's Exterior Gloss Enamel Paint.

Treatment No. 3 - Apply to metal surfaces (including factory primed or pre-finished)

One coat - Moore's Retardo Primer.

Two coats - Moore's Housepaint.

Treatment No. 4 - Apply to all exterior wood siding, beams, soffits, trim, etc.
Two-coats Olympic semi-transparent stain.

Treatment No. 5 - Apply to all exterior door frames, window frames, and pane doors.

One coat - Moore's Primer.

Two coats - Moore's Housepaint.

Treatment No. 6 - Apply to all Interior door and window frames and trims, baseboard, panel doors, etc.

One coat - Moore's Primer.

Two coats - Moore's Satin Impervo Enamel.

Treatment No. 7 - Apply to all Gypsum Board in livingroom, bedroom, hallway, dining room and closets.

One coat - Moore's Primer.

Two coats - Moore's Dulamel Enamel.

Treatment No. 8 - Apply to all Gypsum Board in kitchen and bathroom.

One coat - Moore's Primer.

Two coats - Moore's Impervo Enamel.

Treatment No. 9 - Apply to all hardwood (teak) including handrail, counter trim and ledges.

One coat - Watco Clear Danish Oil Finish.

SECTION 10A. BUILDING SPECIALTIES

1. GENERAL:

The work included in this section of the specifications shall provide for the furnishing and installation of the items listed below.

2. MATERIALS:

- a. Mailboxes: Bommer Model 9040, 4 gang, extruded aluminum with FE2 medium bronze enamel finish. Bommer Model 9343 surface mount aluminum frame with FE2 medium bronze enamel finish.
- b. Aluminum Railings: To be as manufactured by Isle Craft.
System shall consist of posts at 5'0" o.c. unless shown otherwise or approved, (Isle Craft No. H1516); Top Rail, (Isle Craft No. D2557); Bottom Rail, (Isle Craft No. C1511); and Balusters at 5" o.c. (Isle Craft No. B0645). All aluminum components to be anodized "dark Bronze". Type of attachments and railing heights as shown on the drawing. Submit shop drawings for approval prior to fabrication.
- c. Door Chime: Chimes to be Nutone MCV-309N, non-electric, with peep hole and name plate, dark bronze finish.
- d. Drapery Track: "Kirsch" series 94001, wall mounted, cord operated traverse track, two-way draw set, extruded aluminum components with medium bronze finish.
- e. Closet Hardware: Stanley Model No. 7045, combination shelf and closet pole bracket.
- f. Handrail Bracket: Builders Brass No. 253, bronze, 3" base or approved equal.
- g. Closet Pole Supports: Stanley No. 7056, plastic pole sockets, single screw mounting.

SECTION 10B. IDENTIFICATION DEVICES

1. GENERAL CONDITIONS:

As specified in Section 1A.

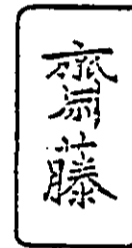
2. GENERAL:

Sign will include two number signs for each unit. One sign to be attached at Entry door and the other to be at front of the common Entry bridge to each group of units. Also there is to be a sign at the Entry to the project designating the name of the complex.

All of the above signs will be supplied by the Owner and are to be installed by the Contractor.

10.161 LAMINATED PLASTIC TOILET PARTITIONS,
URINAL SCREENS, AND SHOWER COMPARTMENTS

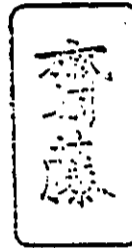
1. Toilet Partitions: Global Steel Products "Regal" floor supported partitions constructed of plastic laminate bonded to particle board core. All hardware to be chrome plated brass or stainless steel. Zamac will not be acceptable.
2. Urinal Screens: Global Steel Products "WH" wall hung screens of same construction as Toilet Partitions.
3. Shower Compartments: Global Steel "Shower-Dressing Room Combinations". Sizes as indicated, of same construction as Toilet Partitions. Shower receptors to be site fabricated (or fiberglass) to suit conditions.



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10.200 LOUVERS AND VENTS

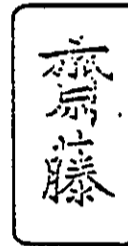
1. Exterior Wall Louvers: Extruded aluminum stormproof louvers, 4" deep, with bronze anodized finish. Units complete with frame on four sides, frame reinforcing, and blade reinforcing where required. Construction Specialties model 4130, or equal.
2. Interior Wall Louvers: Galvanized steel louvers with factory applied baked enamel finish. Louver size and style as selected. Airolite Co., or equal.
3. Door Louvers: For wood and steel doors where scheduled. Formed steel louvers with "2" blades complete with mounting mouldings. Airolite Co. model 560C, or equal. Finish with factory applied baked enamel.
4. Mount louvers in accordance with manufacturer's instructions. Protect aluminum louvers from contact with dissimilar materials.



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10.260 WALL AND CORNER GUARDS

1. Loading Dock Area: Steel angles integrally cast into concrete columns and laid with CMU walls at corners where indicated to protect structure from damage. Angles to be 3" x 3" x 3/16" x 6'-0" long with 3/8" diameter anchor bolts at 2'-0" o.c. unless otherwise noted. Angles to be factory prime painted.
2. Kitchen Area: Stainless steel corner guards as manufactured by Inryco "Milcor", or equal. Type, size, and mounting to be selected.



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10.350 FLAGPOLES

1. Flagpoles to be 35 feet high aluminum tapered poles with bronze anodized finish as manufactured by Baartol Co., or equal. Units to be complete with non-fouling truck assembly and ball at top, halyard, halyard cleats, mounting collar, lightning ground spike, and flashing collar at grade.
2. Install in concrete footings in strict accordance with the manufacturer's instructions.



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10.400 IDENTIFYING DEVICES

1. Provide the following signs where required. Sign materials and graphics presentation to be selected.
 - A. Fire-related signs at elevator call buttons.
 - B. Fire-related signs on fire hose cabinets, and on Stair Well doors.
 - C. Bronze plate signs at Fire Department Inlet Connections.
 - D. Floor Designation Signs at Stair Wells.
 - E. Non-Illuminated Fire Code Exit and Occupancy Signs as required by Code.
2. Install above signs with mounting devices appropriate to the substrate. in conformance with the manufacturer's instructions.



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10.520 FIRE EXTINGUISHERS, CABINETS,
AND ACCESSORIES


1. Standard fabricated units as manufactured by Allenco, Peter Roemer, or equal. Extinguisher sizes and types, cabinet sizes, types, and mounting, and accessories types to be selected. All units to conform to NFPA and local code requirements.



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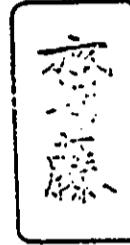
10.620 FOLDING PARTITIONS

1. Manually operated individual panel Sound partitions supported by ceiling track. Sound rating STC 43 minimum. Panels 3" thick with fire retardant vinyl finish surfaces. Partitions shall be complete with track, hangers, fixed sound seal at tops of panels, drop type pressure seals at bottoms of panels, and all required hardware. Partition to be Holcomb and Hoke Model 3000, or equal.


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Consulting Engineer

11.415 UNIT KITCHENS

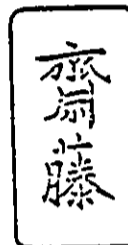
1. For Suites: Dwyer model E63EC, or equal, complete with electric cooktop, oven, refrigerator, sink, base cabinets, countertop with side & back-splash, and upper cabinets.
2. For Employee Units: Dwyer model E72EC, or equal, similar to suite units.
3. Set units in place and coordinate plumbing and electrical connections with respective Sections.



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11.870 LOADING DOCK EQUIPMENT

1. Dock Leveler: Recessed type automatic hydraulic dock leveler as manufactured by Kelley Co., Inc., or equal. Unit to be complete with all required electrical switches and safety devices. Install in strict conformance to the manufacturer's instructions.
2. Dock Bumpers: 10" x 36" horizontal type corded rubber bumpers as manufactured by Durable Mat Co., Pawling Rubber Corp., or equal. Install per manufacturer's instructions.

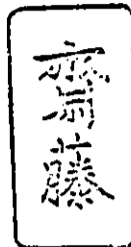


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11.970 THEATER AND STAGE EQUIPMENT

1. Stage lighting, spotlights, and lighting control panels to be part of an allowance to be negotiated with the Owner.
2. Provide above items as part of this allowance for:

- A. Nite Club
- B. Main Dining
- C. Ballroom
- D. Luau Stage



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Consulting Engineer

SECTION 11A. KITCHEN AND LAUNDRY EQUIPMENT

1. GENERAL CONDITIONS:

As specified in Section 1A.

2. GENERAL:

- a. Each piece of kitchen and laundry equipment shall arrive at the job properly packed and stored to prevent damage.
- b. Materials as specified or **Designer** approved equal. Equipment may be the products of different manufacturers however, all equipment of one type will be the products of one manufacturer.

3. MATERIALS:

a. Refrigerator:

Whirlpool EXT15NT, 15 cubic foot, automatic cycle defrost 115V, 60 Hertz. Color - White. Verify hand of door before ordering.

b. Range:

Whirlpool RTE2770 drop in type model with oven window and light. Color - White. Furnish complete with pigtail connection, rated for 208/120V, 1-phase, 60 Hertz operation.

c. Range Hood Fan:

Nutone V25 series ductless hood fan model V-25CC30 with two speed fan, light, charcoal odor filter and aluminum mesh grease filter, 115V, 60 Hertz.

d. Disposal:

In-Sink-Erator model 77, 1/2 H.P., 60 cycle, 1725 rpm, 115V 60 Hertz, 15 amps whisper quiet with stainless steel body.

e. Dishwasher:

Whirlpool SXU-400 Supreme Undercounter, 115V., 60 Hertz.

f. Washing Machine:

Whirlpool LXB-4900 electric washer 115V, 60 Hertz. Color - White.

g. Dryer:

Whirlpool LXE-4900 electric dryer 115V, 60 Hertz. Color - White.

h. Washer-Dryer Stand:

Whirlpool LCK 1100.

14.200 ELEVATORS

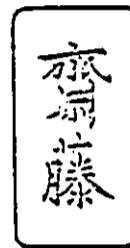
1. Passenger Elevators: U.S. Elevator Co. model #UST 3035, with basement "underslung" machine room, electric Traction operation.
 - A. Capacity: 3000#
 - B. Speed: 200 FPM
 - C. Car Size: 7'-0" x 5'-6"
 - D. Doors: Biparting
 - E. Number of Stops: 6
 - F. Signals:
 - 1) Illuminated car and hall round pushbuttons
 - 2) Digital floor indicators in car and at all floors
 - 3) Directional arrows
 - 4) Fireman's emergency service controls
 - 5) Emergency telephone
 - G. Cab: Decorative as designed - Non standard finishes.
2. Service Elevators: Same as Passenger Elevators except:
 - A. Digital floor indicators in car and at main floor only.
 - B. Cab: Service type as designed.
3. Banquet Elevator: U.S. Elevator Co. Series 3000 hydraulic elevator.
 - A. Capacity: 3000#
 - B. Speed: 125 FPM up and 150 FPM down
 - C. Car Size: 7'-0" x 5'-6"
 - D. Doors: Biparting
 - E. Number of Stops: 2
 - F. Signals:
 - 1) Illuminated car and hall round push buttons
 - 2) Digital floor indicator in car
 - 3) Directional arrows
 - 4) Firemen's emergency service controls
 - 5) Emergency telephone
 - G. Cab: Service type as designed.



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14.555 LINEN CHUTES

1. Chutes fabricated of aluminized steel. 20" diameter chute, 18" square side hinged 1-1/2 hour 'B' label intake doors, 20" x 30" top hinged 1-1/2 hour 'B' label discharge door, roof vent, and internal fire sprinkler system. Chute as manufactured by Wilkinson Chutes, Inc., or equal.
2. Install chutes with supports at each floor in strict conformance with the manufacturer's instructions.



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SECTION 15.400 PLUMBING

PART 1 GENERAL

1.1 SCOPE:

- A. Include all labor, materials, equipment, services and related work to complete all plumbing and drainage work within the full intent of the drawings and these specifications.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS:

A. Site Utilities:

1. All exterior underground water and sanitary piping beyond 5'-0" from the building. Make final connection to service piping and coordinate the installation of work to insure that the final connection with exterior service lines may be accomplished without unnecessary off-sets and changes of direction in the piping. Verify elevation of all sanitary sewer piping.

B. Miscellaneous Metal:

1. Access panels and doors in ceilings and walls where required for access to valves, equipment, etc. Coordinate exact locations and sizes of panels and doors to insure that proper access to all items may be attained.
2. Exterior gutters and downspout piping.

C. Toilet Room Accessories:

1. Toilet and bathroom accessories such as paper holders, towel dispensers, etc.

D. Main laundry, guest laundry, and Food Preparation and Serving Equipment:

1. All laundry and kitchen and food service equipment. Install all rough-in piping and make all final connections to this equipment following the requirements of the equipment supplier. In the event of conflict between the contract drawings and the requirements of the equipment supplier the provisions

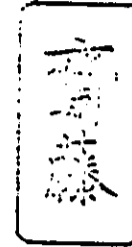


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of the contract shall govern. However, any such conflict shall be immediately brought to the attention of the Architect.

E. Swimming Pool, Exterior Waterscape, and Landscape Irrigation Systems:

1. Install water and drain line connections for continuation under the Applicable Sections.



F. Air Conditioning and Ventilation:

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1. All work required beyond the capped water and drain pipe work necessary to connect up with the air conditioning equipment. Capped water connections provided to within 2'-0" of the final connection under the air conditioning section.

G. Electrical Work:

1. Installation of starters furnished under this section shall be done under the electrical section. All electric power wiring, conduit, etc., for equipment required under this section shall be done under the electrical section.

H. Cast-in-place Concrete:

1. concrete pads for floor mounted equipment provided under this section.

I. Separate Contract:

1. On site electrical generation system to be provided under a separate contract including exhaust systems, fuel systems, and heat recovery system to generate 140° domestic hot water requirements for the project, complete with storage tanks and hot water booster pumps.

1.3 QUALITY ASSURANCE:

- A. Comply with the requirements of the State Health Department, and all City and County codes, and the Maui Fire Department. Submit certification that the work meets the above requirements to the Owner or before final payment is made.
- B. Electrical work: In accordance with the National Electrical Code.

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1.4 SUBMITTALS:

- A. Submit seven sets of equipment manufacturer's certification drawings to the Mark Saito
Consulting Engineer for review details. Layout shop drawings are not required unless specifically requested or unless the Contractor requests a change from the contract drawings. Layout drawings showing requested revisions shall clearly indicate where deviations from the contract drawings are requested. Piecemeal submittal of data are not acceptable and such submittals will be returned without review.

1.5 RECORD DRAWINGS AND BROCHURES:

- A. Maintain a set of marked up record drawings of the installation and upon final completion, submit reproducible copies of these drawings to the
- B. Provide complete brochure of all approved shop drawings for the project to the Owner.

1.6 INSTRUCTIONS FOR OPERATION:

- A. Provide a complete set of operating and maintenance manuals, covering equipment and systems installed under this section. Submit manuals no later than six months prior to completion and/or beneficial occupancy.

1.7 GUARANTEE:

- A. Provide the following guarantee:
1. All equipment, accessories, and material provided under this section against all defects in material and workmanship, for a period of one year from the date of final acceptance, or complete or partial beneficial occupancy by the Owner confirmed by written Agreement. If any equipment fails, does not operate satisfactorily or shows undue wear, remedy the defect and the damage to other work caused by such defect immediately at no expense to the Owner.
 2. That all equipment will produce the capacity and performance specified or shown.
 3. All piping must be drip tight and properly installed to be free of vibration, pounding or objectionable noise.
- B. The above Contractor guarantee shall not be interpreted

as voiding, limiting or reducing any equipment manufacturer's warranty.

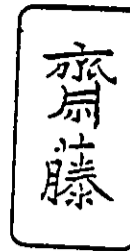
PART 2 PRODUCTS

2.1 PIPE:



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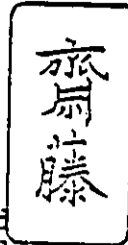
- A. All soil, waste, and interior downspout lines, and all vent lines 3" and over: Standard weight cast iron, hub and spigot pipe coated inside with coal tar varnish while hot; or standard weight cast iron pipe with "Ty-Seal" joints as manufactured by Tyler Pipe and Foundry Co.; "No-Hub" pipe conforming to Cast Iron Soil Pipe Institute Standard 301-75 with cast iron coupling with stainless steel bolts and a full circle neoprene gasket as manufactured by MG Coupling Co., or equal may be installed above and below grade. "No-Hub" pipe with stainless steel couplings shall not be installed underground. DWV copper drainage pipe and fittings may be provided in lieu of cast iron pipe for above ground soil and waste lines under 3" only.
- B. Vent piping under 3" above ground: DWV copper drainage pipe and fittings.
- C. Underground water piping, 4" and over: Cast iron hub and spigot pipe with mechanical joints designed for 150 psi working pressure.
- D. Underground water piping under 4", and underground wet standpipe lines: Hard drawn copper tubing, type "K".
- E. Hard drawn copper tubing, type "L":
 - 1. All cold water piping above ground
 - 2. All hot water piping above ground
 - 3. All drain lines from water heater temperature and pressure relief valves.
 - 4. All compressed air lines
 - 5. All wet standpipe lines above ground
- F. Hard drawn copper tubing, type "K":
 - 1. All underground hot and cold water lines (3" and under)



2. All wet standpipe lines below ground
- G. Standard weight, galvanized steel pipe:
1. All dry standpipe lines above ground. Underweight Laboratories approved for 300 psi working pressure. Pitch horizontal dry standpipe lines a minimum of 1/4" per 10 feet.
- H. Underground dry standpipe lines: Cast iron, hub and spigot pipe with mechanical joints designed for 300 psi working pressure.
- I. Above ground downspout lines installed in cast-in-place concrete: Schedule 40 PVC pipe with solvent weld fittings.
- J. Schedule 40 black steel pipe:
1. All gas piping
 2. All diesel fuel piping including tank fill and vent lines
 3. All steam supply piping
- K. Schedule 40 "Yoloy" pipe schedule 40 wrought iron pipe, or schedule 80 black steel pipe:
1. Steam return and boiler feed piping.

2.2 FITTINGS:

- A. Cast iron pipe: Cast iron, standard weight, hub and spigot soil pipe fittings.
- B. DWV copper lines: DWV copper or brass solder fittings.
- C. Type "L" or "K" copper pipe: Copper sweat fittings.
- D. Galvanized steel pipe: Standard weight galvanized malleable iron, heavily beaded, screwed fittings.
- E. Cast iron underground water service lines: Cast iron, hub and spigot with mechanical joint fittings designed for 150 psi working pressure.
- F. Black steel pipe: Standard weight heavily beaded, black, malleable iron screwed fittings.



Yasuki Saito
Consulting Engineer

- G. Schedule 40 PVC pipe: Solvent weld fittings.
- H. Unions on copper tubing 2" and smaller: Similar and equal to Mueller Streamline ground joint; 2-1/2" and larger similar and equal to Mueller Streamline flanged union with brass bolts.
- I. Provide unions at all equipment and accessory locations and at screwed valves.
- J. Where lines of dissimilar metals are connected, install dielectric unions.

2.3 VALVES (EXCEPT HOSE END VALVES):

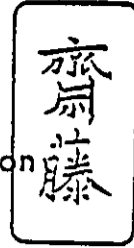
- A. Provide gate valves, check valves, and plug cocks where shown on the drawings and as required to isolate risers, equipment, and groups of fixtures.
- B. Valve schedule:

	<u>Stockham</u>	<u>Crane</u>	<u>Lunckenheimer</u>	<u>Walworth</u>	<u>Powell</u>
Gate valves 2" & smaller	B-107	428	2127	2	50
Gate valves 2-1/2" & 3"	G-608	460	1427	719	1786
Gate valves 4" & over	G-612	461	1428	719F	1787
Check valves 2" & smaller	B-319	37	2144	406	57E
Check valves 2-1/2" & 3"	G-927	372	1789	928	558
Check valves 4" & over	G-931	373	1790	928F	559

- C. Plug cocks on gas lines: Nordstrom or equivalent.
- D. Plug cocks on water lines: Homestead Fig. No. 601 or equivalent, with dial indicators and "memory stops".

2.4 PIPE HANGERS AND SUPPORTS:

- A. Pipe hangers:
 1. Horizontal steel or cast iron piping: Grinnell Fig. No. 260, Auto-Grip zinc plated hangers, or Fee and Mason Fig. No. 239.
 2. Horizontal copper piping: Grinnell Fig. No. 97CP, Auto-Grip copper plated hangers, or Fee and Mason Fig. No. 365.



B. Riser clamps: Grinnell Fig. No. 261, or Fee and Mason Fig. No. 241.

C. Concrete inserts: Grinnell Fig. No. 282, or Fee and Mason Fig. No. 2570.

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2.5 PIPE SLEEVES:

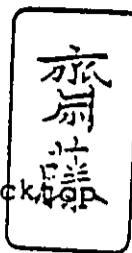
A. Sleeves through outside walls, above and below grade and through mechanical equipment room floors above grade: Black iron schedule 40 pipe.

B. All other sleeves through interior walls and floors: 18 gauge galvanized iron or heavily waxed Sonoco Products Co., fiber pipe sleeves.

2.6 CLEANOUTS:

- A. In the following specifications, figure numbers are as manufactured by Jay R. Smith Co. Similar units as manufactured by Zurn Co., Josam Co., or Wade, Inc. may be furnished.
- B. Finished Room Floors: Fig. No. 4023 cast iron adjustable floor level cleanout assembly with round nickel-bronze top.
- C. Resilient Tile Floors: Fig. No. 4143 cast iron adjustable floor level cleanout assembly with round nickel-bronze top. Top depression to be covered with surrounding floor pattern bonded with waterproof adhesive.
- D. Terrazzo Floors: Fig. No. 4183 cast iron adjustable floor level cleanout assembly with round nickel-bronze top with center lifting device. Top depression to be filled with terrazzo and finished.
- E. Unfinished Floors: Fig. No. 4223 all cast iron adjustable floor level cleanout assembly with round heavy duty top.
- F. Carpeted floors: Fig. No. 4023X nickel-bronze rug clamping frame and access cover with cleanout body and plug.
- G. Above Ground Caulk Ferrule Cleanouts: Fig. No. 4421 cast iron ferrule with countersunk bronze plug. Fig. No. 4471 for plug only.
- H. Yard Areas: Fig. No. 4253 cast iron concrete surface

level cleanout assembly with lifting device. For black
or earth surface, furnish Fig. No. 4263.



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2.7 BACKFLOW PREVENTER:

- A. Hersey-Sparling "Beeco" Model No. 6C or approved equivalent line size unit with bronze or galvanized cast iron body, bronze fitted, complete with gate valves on inlet and outlet. Provide relief drain line terminating as shown.

2.8 DOUBLE CHECK VALVE ASSEMBLY:

- A. Cla-Valve model D, Hersey model #1, or approved equivalent.

2.9 GAUGES:

- A. Pressure gauges: Ashcroft Fig. No. 1010, Trerice No. 600, or Marsh No. 100.
- B. All gauges: White dial face and black needle, installed with gauge cocks and "snubbers".

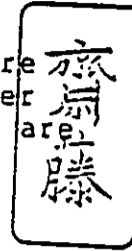
2.10 180° WATER HEATERS:

- A. Provide two Bock Corp. Model No. 130 E factory built, light oil fired storage water heaters.
- B. Heater construction: A.S.M.E. 100 gallon capacity tanks designed for a minimum of 150 psig working pressure, glass lined tanks, 2" insulation blanket, with enameled steel outer jacket. Install in accordance with the requirements of the A.S.M.E. Boiler Code including individual temperature/pressure gauges, and automatic high temperature fuel cutoff. Magnesium rods spaced to protect against corrosion.
- C. Burner and controls: Light oil (#2) U.L. Listed burner controlled through an operating thermostat and a high limit thermostat, with electronic eye flame scanner and relay.

2.11 WATER HEATER FLUE:

- A. Metal bestoes type SS "All-Fuel" with cleanout access doors, from the heaters through the roof. Provide flashing at roof, supports, and weather cap. Provide barometric dampers if required by the heater manufacturers.

- B. Breeching and stack size and height of stack shown are for estimating purposes only. Consult with the heater manufacturers to verify that all sizes and dimension are compatible with the heaters to be provided.



2.12 STEAM TRAPS AND STRAINERS (LAUNDRY):

A. High Pressure traps and strainers:

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1. Provide at all drip points on the steam lines and on return lines from laundry equipment: Series 800 high pressure steam return trap as manufactured by Armstrong Machine Works, or approved equal traps as manufactured by Illinois Products Co., or Dunham-Bush Co.
2. Traps shall be of the inverted bucket type with side inlet, designed for maximum working pressure of 250 lbs. steam, of sizes and capacities in strict accordance with the recommendations of the trap manufacturer, and for not less than 150% of the equipment rating based on a 2 psi pressure differential.
3. Install traps complete with gate valve and strainer with valved blowoff at inlet, and gate and check valves at discharge. Install unions on each side of traps and strainer at inlet.

2.13 COMPRESSED AIR PIPING ACCESSORIES (LAUNDRY):

- A. Provide air cock assemblies where shown, complete with 1/2" shutoff valve and quick disconnect coupling air hose connection, Lincoln Engineering Co., No. 815 or equivalent.

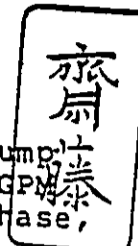
2.14 GREASE TRAPS:

- A. Josam No. JA-5 or equivalent trap as manufactured by Zurn Co., Jay R. Smith Co., or Wade, Inc., constructed of cast iron with bolted and gasketed cover, cascade bottom, flow control fitting, and minimum rating of 35 GPM with grease capacity of 75 pounds.
- B. Traps shall be arranged for fully recessed installation with 6" cast iron extension, and cover flush with the floor.

2.15 ELEVATOR PIT SUMP PUMPS:

- A. Chicago Pump Co., No. 3U-704, Weinman Pump Co., No.

MA-35, Weil Pump Co., Model #SS-801-R, or Aurora Pump Co., Model #NSS-16, with a minimum capacity of 25 GPM against 15-foot head, 1/3 H.P., 1750 RPM, single phase, 60-Hertz, 120 volt, motor.



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- B. Pump construction: Cast iron casing with integrated strainer, float, electrode, or micro-switch control, and 15-foot waterproof cable.

2.16 180° HOT WATER CIRCULATOR:

- A. Provide an all bronze circulator on the 180° hot water return line as manufactured by Bell & Gossett Co., Taco Co., or H.A. Thrush & Co. Install necessary valves, drains, etc.
- B. Circulator capacity: 8 GPM against a 25-ft. head with a 1/6 H.P., 120-volt, single-phase, 60-Hertz, constant speed motor.

2.17 AIR CUSHION FITTINGS:

- A. Jay R. Smith "Hydrotrol" or equivalent. Provide model No. 5060 fittings on cold and hot water lines to the 125 lb. washer-extractors in the main laundry.

2.18 WASHER SHUTOFF VALVES (GUEST LAUNDRY):

- A. Provide Symmons No. W-400-B shutoff valves for washing machine hose connections for each washer in the guest laundry area, with 1-pair of Price-Pfister No. 13-041 1/2" concealed screwdriver stops.

2.19 HOSE COCKS:

- A. Interior hose cocks: Price-Pfister No. 87-020, 1/2" satin chrome finish loose key sill faucet with 13-041, 1/2" concealed screwdriver stop.
- B. Exterior hose cocks: Price-Pfister No. 83-310, 3/4" rough brass loose key hose cock with No. 107-430, 3/4" rough brass square head service cock.

2.20 FIXTURES:

- A. Provide the following fixtures, where shown on the plans, with all trim, escutcheons, etc. Where sizes are shown, they are minimum. All exposed metal trim shall be chrome plated. Fixture numbers are set up as a standard only. Equivalent fixtures as manufactured by American Standard

Co., Crane Co., Eljer Co., or Kohler Co., may be furnished.

B. Fixture schedule:

1. Water Closets (Public and Employee Toilets):

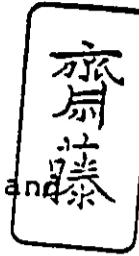
- a. Fixture: - American Standard No. 2222.016, white, vitreous china, floor set, siphon jet, elongated bowl closet, with 1-1/2" top spud
- b. Flush valve: - Delaney #402 VBQG "Flushboy" or Sloan #110Y0 "Royal"
- c. Seat: - Church #9500C or Beneke #527 SS-HPSS, white, open front seat, less cover, with self-sustaining hinge
- d. Accessories: - Closet bolts, nuts, washers, and china bolt caps

2. Handicapped Water Closets (Public and Employee Toilets):

- a. Fixture: - American Standard No. 9468.018, white, vitreous china, floor set, siphon jet, elongated bowl closet with 1-1/2" top spud
- b. Flush valve: - Delaney #402 VBQG "Flushboy" or Sloan #110Y0 "Royal"
- c. Seat: - Church #9500C or Beneke #527 SS-HPSS, white, open front seat, less cover, with self-sustaining hinge
- d. Accessories: - Closet bolts, nuts, washers, and china bolt caps

3. Water Closet (Guest Rooms):

- a. Fixture: - American Standard No. 2130.078, white, vitreous china, floor set, siphon jet, back outlet, elongated bowl closet combination
- b. Seat: - Church #380, or Beneke #520, white, closed front seat with cover
- c. Supply: - Brasscraft #CR 3912DL or approved equal, 1/2" angle supply with copper compression valve and oval handle



d. Accessories: - Closet bolts, nuts, washers, and china bolt caps

4. Handicapped Water Closets (Guest Rooms):

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a. Fixture: - American Standard No. 2134.013 white, vitreous china, floor set, siphon jet, back outlet elongated bowl closet combination

b. Seat: - Church #380, or Beneke #520, white, closed front seat with cover

c. Supply: - Brasscraft #CR3912DL or approved equal, 1/2" angle supply with copper compression valve and oval handle

d. Accessories: - Closet bolts, nuts, washers, and china bolt caps

5. Urinals:

a. Fixture: - American Standard No. 6580.013, white, vitreous china, blowout, wall hung urinal with 3/4" top spud

b. Flush valve: - Delaney #451 AVBQ "Flushboy" or Sloan #186 "Royal"

c. Accessories: - Chair carrier with block feet at floor

6. Lavatories (Public and Employees' Toilets):

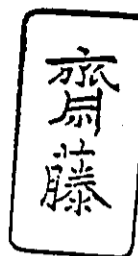
a. Fixture: - Colton No. 410 white, vitreous china, 19" X 16" oval counter top lavatory

b. Supply and drain fitting: - Moen #4625 with aerator.

c. P-trap: - 1-1/4" X 1-1/2", 17 gauge, C.P. brass P-trap with trap cleanout and wall flange

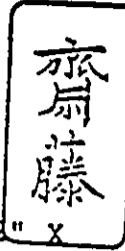
d. Supplies: - Brasscraft #CR 3912A or approved equal 1/2" angle supply with copper compression valve and oval handle

e. Drain: - American Standard #2411.015



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7. Lavatories (Guest Rooms):
 - a. Same as specified for public and employees' toilets, except with pop-up drain.
8. Lavatories (Hand Sinks in Food Prep. Areas):
 - a. Fixture: - American Standard No. 0350.132, white, vitreous china, 20" X 18", wall hung lavatory with concealed arms, punched for single faucet
 - b. Supply fitting: - American Standard #7679.012 wall mounted pedal valve and #7522.030 spout
 - c. Drain fitting: - American Standard #2411.015, 1-1/4" drain with perforated strainer
 - d. P-trap: - 1-1/4" X 1-1/2", 17 gauge, C.P. brass P-trap with trap cleanout and wall flange
 - e. Accessories: - Provide chair carrier with block feet
9. Bathtubs (Typical Guest Room):
 - a. Fixture: - American Standard No. 0135.137 or 0137.133, 60" long, white, acid resisting enameled steel recessed tub, with slip resistant bottom
 - b. Shower & bath fitting: - Moen #BB-3150-TR with 3 GPM flow restrictor and integral stops
 - c. Drain fitting: - American Standard #1560.101 pop-up bath drain
10. Bathtub ("Honeymoon" and "Royal" Suites):
 - a. Fixture: - American Standard No. 2640.019, 60" long, white, acid resisting enameled cast iron recessed tub with slip resistant bottom
 - b. Shower & bath fitting: - Moen #BB-3150-TR with a 3 GPM flow restrictor and integral stops
 - c. Drain fitting: - American Standard 1560.101 pop-up bath drain



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11. Service Sinks:

- a. Fixture: - American Standard No. 7692.049, 22" X 19" white enameled cast iron
- b. Supply fitting: - American Standard #8341.075 with integral stops and vacuum breaker
- c. Trap: - American Standard #7798.101, 2" cast iron
- d. Accessories: - American Standard #8381.014 rim guard

12. Showers:

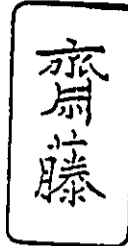
- a. Fixture: - Receptor and enclosure provided by General Contractor
- b. Supply fittings: - Moen, Model 3174 concealed non-scald valve with volume control, integral stops, shower head, arm, flange, and 3 GPM flow restrictor
- c. Drain: - See specification under "Drains" article

13. Guest Room Bar Sinks:

- a. Fixture: - Elkay No. LR-1517 18 gauge stainless steel self-rimming single compartment sink with sound deadening
- b. Faucet: - Elkay #2088-8
- c. Strainer: - Elkay #LK-18B
- d. Supplies: - Brasscraft #CR 3912A or approved equal 1/2" angle supply with copper compression valve and oval handle
- e. Trap: - 1-1/2" X 2", 17 gauge C.P. brass P-trap with trap cleanout and wall flange

14. Electric Water Coolers:

- a. Fixture: - Halsey Taylor No. SW-8-A or Haws No. HWS-8 wall hung, air cooled water cooler with minimum recovery of 8.0 GPH from 80° to 50° with 90° ambient air temperature. Top shall be stainless steel. Cabinet shall be baked enamel finish in color selected by the Designer.



2.21 DRAINS:

- A. In the following specifications, figure numbers are as manufactured by Jay R. Smith Co. Equivalent units manufactured by Zurn Co., Josam Co., or Wade, Inc., may be furnished. Mark Saito
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- B. Roof Drain: Fig. No. 1010 cast iron seep-proof drains with dome strainer, clamping ring, adjustable brass bolts, and hub outlet.
- C. Floor Drains in Trash Room, and Mechanical Equipment Rooms: Fig. No. 2110 cast iron body drains with safety pan, cast iron round grate, hub outlet and clamping device on all drains in floors above grade.
- D. All Other Floor Drains and Shower Drains: Fig. No. 2010-A cast iron body drains with brass adjustable head, round chrome plated brass strainer, clamping device and hub outlet.
- E. Floor Sinks: Fig. No. 3435 cast iron square floor sink with acid resisting enameled interior, full grates, one half angle grates, or without grates, as shown, and caulk outlet.

2.22 INSULATION

- A. All insulation installed for the project mechanical systems shall provide a UL flame spread rating not to exceed 25, and a smoke developed and fuel contributed rating not to exceed 50.
- B. Insulation for all above ground insulated pipe: Owens-Corning Fiberglas heavy density sectional with All Service Jacket, vinyl-scrim-reinforced, with self-sealing lap, and with factory-applied adhesive butt-joint strips, for all hot, cold, concealed and exposed pipes; insulation to be of the thickness indicated below, applied in accordance with manufacturer's recommendations, with all self-sealing adhesive firmly pressed into place with a nylon tool provided for that purpose. Provide mitered sections at all elbows, and fittings, finished with a skim coating of insulating cement, OC Fitting Mastic, and reinforcing fabric. On all pipe handling chilled condensate or drainage and on all pipe sizes over three inch, provide solid foam insulation blocks of length equal to at least one and one half the pipe diameter under all pipe carriers, with metal saddles. After testing and making tight, insulate

the above ground piping with insulation thickness indicated.



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1. Hot water supply piping (1")
 2. Hot water return piping (1")
 3. Drain lines from floor drains in mechanical equipment rooms which receive condensate from air conditioning units from the drain fixture to the connection to the vertical stack (1")
 4. Drain lines from electric water coolers and drinking fountains supplied with refrigerated water, from the fixture to the connection to the vertical stack (1")
 5. Steam supply and return piping (1")
- C. Insulate hot water and hot water return lines below grade with 1" foamglass insulation, with joints tightly butted and the wrapping laps brushed with approved coating and pressed in place, secured in place with stainless steel insulation straps on 9" centers. Wrap one layer of glass fabric cloth over the insulation and coat the entire exterior surface with bitumastic cement.
- D. All insulated piping valves, and fittings exposed to weather: Cover with weatherproofed aluminum jacketing, as manufactured by Childers Products Co., P.O. Box 7065, Los Angeles, California, or approved equivalent, fabricated from T/3003(3S) .016 gauge aluminum with factory attached moisture barrier (30-90-30 duplex waterproof asphalt laminated paper).

2.23 THERMOMETERS:

- A. Provide 4-1/2" dial type mercury vapor pressure actuated thermometers as manufactured by Trerice Co. with stems set at the required angles, and 3-1/2" stems with thermometer wells.
- B. Thermometer schedule:
1. Hot water mains from water heaters (30° - 190°)
 2. Hot water return ahead of circulators (30° - 190°)

2.24 FIRE DEPARTMENT SIAMESE CONNECTION:

- A. Dry standpipe fire department connections: Standard Fire

West Co., or equivalent units as manufactured by Potter-Roemer, Badger-Powhatan, Sierra Fire Equipment Co., or W.D. Allen Co., mounted at heights indicated.



- B. Construction: Cast bronze flush mounted wall type chrome plated brass plate, four 2-1/2" inlets with caps and chains, 6" outlet, integral clapper type check valves, National Standard threads, and cast-in lettering reading "Dry Standpipe".
- C. Provide a drain valve at the lowest point.

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2.25 HOSE END VALVES:

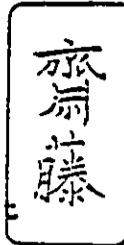
- A. In stairwells: Badger-Powhatan No. 19-281, Standard Fire West Co., Fig. No. 281, Sierra Fire Equipment Co. No. V15L, or Potter-Roemer No. 281, 2-1/2" X 2-1/2" Underwriters Approved 300# test hose end valves, with rough brass bodies, National Standard threads, brass caps and chains, and mounted 42" above floors.
- B. Hose outlets at roof: Badger-Powhatan No. 26-296, Standard Fire Hose Co. No. 296, or Potter-Roemer No. 296, 6" X 2-1/2" X 2-1/2" roof connectors, mounted 30" above roof, and with valves as specified in stairwells.

2.26 FIRE HOSE CABINETS:

- A. Fire hose cabinets in finished areas: Wilkirk No. HE1-SL recessed mounted or equivalent cabinets as manufactured by W. D. Allen Co., Elkhart, Sierra Fire Equipment Co., Standard Fire West Co., or General Fire Extinguisher Corp., with baked white enameled finish inside, prime coat outside, solid panel door with decal and ventilation rosettes, Fig. No. 158-U, 1-1/2" Underwriters Labeled chrome plated brass 300-lb. angle valve, with National Standard Threads, Fig. No. U-70 Underwriters Labeled red enameled rack with rack nipple, 75 feet of Underwriters Labeled 1-1/2" unlined linen hose, Fig. No. 250 chrome plated fog nozzle, and ABC-5, five pound dry chemical extinguisher.
- B. Fire hose cabinets in unfinished areas: Same as specified in paragraph "A" above, except with No. HE1-SL-AL surface mounted.

2.27 FIRE EXTINGUISHER CABINETS:

- A. Potter-Roemer No. 2706 recessed cabinets or approved equivalent units as manufactured by W. D. Allen Co.,



Elkhart, Sierra Fire Equipment Co., Standard Fire West
Co., or General Fire Extinguisher Corp., with white
enamel inside, prime coat outside, type "BG" break-glass Saito
door and ABC-10, ten pound dry chemical extinguisher Consulting Engineer

PART 3 EXECUTION

3.1 ACCESS TO EQUIPMENT:

- A. Install all control devices, specialties, etc., to provide for easy access for operation, repair and maintenance; if concealed, access doors and panels shall be provided under other sections of the specification. Coordinate installation of items where access doors and panels are required for proper access. Access is required where valves or controls are installed behind walls or above non-removable ceilings.

3.2 UNDERGROUND PIPE PROTECTION:

- A. Carefully clean all underground gas and fuel lines to remove all dirt, oil, grease, etc., and wrap with no. 340-25 "Plicoflex" laminated tape. Prime pipe surfaces to be covered before application of tape with No. 105 adhesive primer. Exercise care in backfilling around coated pipe to prevent damage to coating.

3.3 JOINTS:

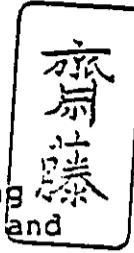
- A. Cut copper pipe square, remove all burrs, dirt, filings, etc., from the inside of the pipe. Braze all pipe and fittings except for DWV piping, and piping 2" and smaller.
- B. Joints in underground cast iron water service lines: Stuffing box type with cast iron glands, nuts and bolts, and rubber gaskets designed in conformance with the governing specifications for the pipe.
- C. Joints in hub and spigot, cast iron pipe: Made with picked oakum, poured molten lead at least 1" deep and caulked tight.
- D. "No-Hub" stainless steel couplings used in conjunction with hubless cast iron pipe shall be tightened to 60 inch-pounds torque on each band screw with a torque wrench specifically designed for the purpose. Each screw band shall be re-torqued after not less than 24 hours. "No-Hub" cast iron couplings shall be progressively and evenly torqued to 175 inch-pounds with wrench available from manufacturer of coupling in accordance with manufacturer's recommendations.



- E. Threads on screwed pipe: Standard, clean cut and tapered. Pipe reamed of burrs and kept clean of scale, dirt and shavings. Threads made up with flaked graphite and lubricating oil or approved piping compound on ~~the~~ male thread only. Mark Saito
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- F. Provide 18" X 18" X 18" concrete thrust blocks and tie rods on each side of all cast iron elbows and tees underground.

3.4 HANGERS:

- A. Install hangers and supports for all pipe work to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment.
- B. Refer to the structural drawings for type of construction from which piping and/or equipment is to be suspended.
- C. Supporting rod diameters for pipe: 3/8" for pipe 2" and under; 1/2" for 2-1/2" and 3" pipe; 5/8" for 4" and 5" pipe; 3/4" for 6" pipe, and 7/8" for pipe 8" and over. Provide at least one hanger per 5'-0" length of cast iron pipe. For cast iron pipe exceeding 5'-0" in length, provide supports at not more than 10'-0" intervals.
 - Locate supports within 18" of each joint. Suspended lines shall be suitably braced to prevent horizontal movement.
- D. Spacing of hangers: On 1/2" copper lines, not greater than 6'-0"; spacing of hangers on all other pipe up to 1-1/2", not greater than eight feet; and on 2" and 3" pipe not greater than ten feet; and on 4" pipe and over, not greater than twelve feet. Provide a hanger at each change of direction of the main.
- E. Support vertical lines by a hanger in the horizontal line near the riser and riser clamps at each floor. In addition, hubless cast iron pipe with stainless steel couplings and "Ty-Seal" joints shall be supported at sufficiently close intervals to keep the system in alignment.
- F. Anchor supporting rods and strap hangers for pipes, equipment, etc., to building structure as follows:
 - 1. Where lines are supported from poured in place concrete slabs, joists, or beams, use concrete inserts.



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2. Where pipes are supported from precast or existing concrete construction, use cinch anchors similar and equal to Phillips "Red Head".
3. Where pipe or equipment is supported below structural steel construction, use approved beam clamps. Provide additional structural shapes to span between beams or joints where necessary.

3.5 PIPE SLEEVES AND COLLARS:

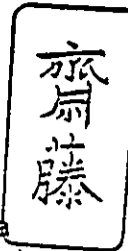
- A. Install sleeves of sufficient size to accommodate the pipe or pipe and insulation, where lines pass through floors or walls. Extend sleeves through mechanical equipment room floors above grade 6" above the floor; through walls, flush with the walls. Caulk space between sleeves and pipes through floors and outside walls above grade with caulking compound; below grade with lead.
- B. When pipes pass through ceilings or walls in finished portions of the building, provide approved pipe collars of sufficient size to completely cover the pipe sleeves or ceiling opening. Fasten collars on pipe that will expand or contract to the building structure.
- C. Caulk space between pipe and sleeves through the slabs and walls of all shafts that are used as air plenums.
- D. Seal all holes in walls around piping through mechanical equipment rooms with suitable resilient material to isolate pipe and to prevent sound transmission paths.

3.6 FLASHINGS:

- A. Flash all pipes passing through the roof at the roof line with sheet lead weighing at least four pounds per square foot, with flashing extending 12" beyond the pipe in all directions and carried to the top of pipe with at least a 1" return inside of pipe.

3.7 SOIL, WASTE, AND DOWNSPOUT LINES:

- A. Install all soil, waste, and downspout lines as shown on the plans. Pitch horizontal soil and waste lines a minimum 1/4" to the foot or as indicated, and horizontal downspout lines and storm sewer lines, a minimum of 1/8" per foot. Make offsets, connections, etc., with 1/8" or 1/16 bends where possible.



3.8 EXCAVATION AND BACKFILL:

- A. Place all lines in the ground straight and true in a trench having a clearance of not less than 6" and not more than 9" on each side of the pipe. Excavate to the required depth, accurately to grade and the earth removed from under the bell so that the pipe rests on earth. When excess dirt has been removed, bring the trench to the required elevation with earth and compact firmly.
- B. Deposit excess dirt at the building site or remove from the premises as required.
- C. Provide all shoring necessary to protect the excavation.
- D. After the installation has been tested and approved, backfill trenches and excavation in 6" layers of earth, free from clods and stones, thoroughly hand tamped to a depth of 12" above the pipe. After that depth has been reached, backfill in 12" layers thoroughly tamped. All backfill shall have a 90% compaction modified AASHTO. Exercise extreme care to prevent damaging underground pipe.

3.9 AIR CHAMBERS:

- A. At the top of all water lines at all fixtures, etc., where shown or required, provide 12" air chambers of the full diameter of the pipe with caps. Crimping and soldering will not be permitted.

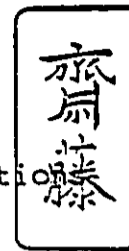
3.10 GAS PIPING:

- A. Install all new gas piping with connections from the utility supplied service to kitchen and food preparation equipment.
- B. Install all lines straight and true, parallel with building walls and columns. Provide shutoff cocks at each connection.
- C. Pay all costs, fees, etc., arising from the installation of the service, and meter.

3.11 LAUNDRY AND FOOD SERVICE EQUIPMENT:

- A. Laundry, kitchen, bar, and food service equipment will be furnished and installed under Section 11. Under this

section, install all rough-in, and make final connections to all equipment requiring plumbing connections and furnish all stops, traps, trim and accessories as required.

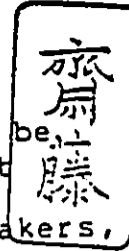


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B. General notes applicable to installation of services for Kitchen and Food Service equipment:

1. Kitchen Equipment Contractor to furnish coffee maker. Plumbing Contractor shall provide a cold water connection terminating in a 3'-0" length of 1/4" O.D. soft copper tubing with a 1/4" female S.A.E. flare fitting on the end.
2. Kitchen Equipment Contractor will furnish disposer units complete with vacuum breaker and full ported solenoid valves. Plumber shall furnish, traps and shut-off valves and make final connections.
3. Exposed pipes to steamers, kettles, etc., may be optionally chrome plated, stainless steel, or as finished. Equipment sinks are provided with 1-1/2" connections. (2" rotary type drains are complete with 1-1/2" threaded waste connection adaptors). Verify with Owner.
4. Indirect waste lines required for standard or fabricated items of kitchen equipment shall be furnished, installed and extended to floor sinks by the Kitchen Equipment Contractor, food preparation sinks excepted.
5. Furnish and install vacuum breaker, and install on water lines to equipment which has water boilers or heating tanks. Coffee urns, steam cookers are examples.
6. At can washer or sterilizer, provide and connect 1-1/2" drain connection with pipe or hose to drain into floor depression (indirect waste). Furnish and install water vacuum breaker.
7. Water chillers (ice plates etc.) shall be provided by the Kitchen Equipment Contractor. Plumbing Contractor shall provide cold water service and make connections to units. Interconnecting insulated pipe between units and faucets to be furnished and installed by the Kitchen Equipment Contractor.

8. Water inlet fittings for dishtable troughs will be furnished and installed by the Kitchen Equipment Contractor. Plumber shall provide cold water service, all interconnecting piping, vacuum breakers, and make final connections.



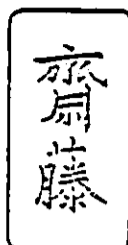
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9. The Kitchen Equipment Contractor will provide all equipment trim including faucets and sink wastes and swing faucets at kettles and ranges, all to be installed by Plumber.
10. All hot and cold water service lines, except short branches to fixtures, shall be insulated.
11. All horizontal piping lines connected to equipment shall be run at the highest possible elevation, and not less than 6" above floor. Piping rough-in shall be stubbed in walls wherever possible.

3.12 EQUIPMENT AND PIPING NOISE AND VIBRATION ISOLATION:

A. General requirements:

1. All mechanical equipment, piping, etc.: Mounted on or suspended from approved and specified foundations or supports.
2. All floor mounted equipment: Erected on a 4" high reinforced concrete housekeeping pad. Where vibration isolation equipment is used, extend pads beyond equipment dimensions to support the isolation system.
3. Guarantee all vibration isolation systems to have the static deflections as specified and indicated on the drawings. Install vibration isolation systems in accordance with the manufacturer's instructions.
4. Weatherproof all vibration isolation systems exposed to a corrosive environment in the following manner: All steel parts to be hot dipped galvanized, all bolts to be cadmium plated and all springs to be cadmium plated and neoprene coated.
5. All vibration isolation equipment including mountings, hangers, structural steel bases, welded concrete pouring forms and flexible pipe connectors shall be furnished by a single manufacturer of vibration isolation equipment.

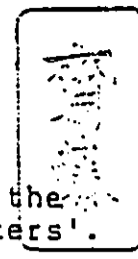


3.13 ELECTRICAL WORK:

- A. Furnish starters to the Electrical Contractor for Mark Saito installation. Receive, unload, handle and set all Consulting Engineer separately mounted motors and starters specified under this section of the specification. Refer to the electrical drawings for the extent of electrical work provided by the Electrical Contractor.
- B. Install immersion thermostat set at 180° with well in the hot water return line to control the circulator.

3.14 TESTS AND CHLORINATION:

- A. Test the plumbing drainage systems before the work is concealed, in the presence of the Inspector. Make test with water by closing the lower end of the main house drain and filling the pipes to the termination of the stack through the roof. Include, all at one time, the house drains and branches as well as all vent and horizontal soil, waste, and vent lines, and all branches from any of those lines to a point above the surface of the finished floor. If the drains to any parts of the system are to be tested separately, provide a head of water at least ten feet above all parts of the work to be tested, and all joints and connections shall be made in one test.
- B. Do not use wooden plugs in testing the system. Confine the tests to vertical sections of such height so as not to develop excessive pressures due to static head.
- C. Test the water supply systems to 200-lbs. for thirty minutes with a maximum drop of 2 lbs.
- D. Chlorinate all new water piping for 8-hour period with chlorine content of not less than 50-parts per million. Introduce chlorine into the water lines in a manner approved by the Engineer. Open and close all valves several times during this period. Flush system clean until residual chlorine content is less than 0.2 ppm after the contact period. Transmit to the Engineer a certificate evidencing this sterilization requirement.
- E. Balance 140° and 180° hot water systems and then prove the balancing by testing at least one fixture on each riser or circulated branch, to obtain design temperature hot water within a maximum of 15 seconds. Make these "proving" tests only after a minimum of four hours of non-usage in the riser or branch to be tested.



- F. Test all fire protection systems in accordance with the requirements of the National Board of Fire Underwriters'.
- G. Exercise care that testing pressures not exceed the manufacturer's test pressures of valves, equipment, etc.
- H. Notify the Engineer, Owner and Authority having control before making any tests.
- I. Remedy all leaks; caulking will not be permitted.
- J. After testing and balancing has been completed and accepted, demonstrate satisfactory operation of the entire installation by continuous (24 hour) operation for a minimum of five (5) days. This operational demonstration may take place concurrent with the Owner's "beneficial occupancy" if such occupancy occurs before final acceptance of the installation.

3.15 VALVE INDEX:

- A. Install .2" diameter brass or plastic tags with designations as determined by the Owner, on all new valves with numbers and letters stamped or engraved thereon designating service of each valve.
- B. Furnish and mount where directed, a chart with metal frame and cover, indicating location, index number and purpose of all plumbing valves.

3.16 IDENTIFICATION AND STENCILING:

- A. Piping system identification: In mechanical equipment rooms, crawl spaces, on roof, and all other accessible locations, provide markers identifying contents of pipes as follows:
 - 1. Place identifying band of color listed in the following schedule, near each valve and fitting, on both sides of pipes passing through wall, and on long pipe runs approximately every 15 feet or closer when directed.
 - 2. Provide label on pipes near each valve, with name of pipe contents in abbreviated form as listed in Schedule under heading, "legend", size of pipe adjacent to each legend, and provide arrow next to legend indicating direction of flow in pipe. Place label legend in location so that it can easily be read from floor. Size of label letters shall vary with size of pipe, as per ANSI A 13 Standard.



3. For general purpose pipe content, valve identification, or direction of flow marking, use Brady B-500 Vinyl Cloth General Purpose Pipe Markers, Westline's WBC Vari-Temperature quality grade waterproof type markers, or approved equal. For identification of rough surface pipes or pipes wrapped with insulation, or where tamperproof identification is required, use Brady B350 Perma-Code Thin Film Pipe Markers. Mark Saito
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4. Provide pipe markers and directional arrows on the pipe on each side where pipes pass through walls, every 15 feet along continuous pipe lines, and at every bay or aisle, and at each riser, elbow and "T" joint.
5. When using directional arrows, point arrowhead away from pipe markers and in direction of flow. If flow can be in both directions, use a double-headed directional arrow instead of a single-headed directional arrow.
6. When Brady B-350 Perma-Code thin film pipe markers are used on chalky, loose or soft insulations, a spiral wrap or Pipe Banding Tape shall be made around the pipe.
7. For 360 deg. color coding of bare pipes, painted pipes, or pipes insulated with a firm covering, use Pipe Banding Tape around each end of the pipe Marker.
8. Schedule of Piping System Identification:

<u>Service</u>	<u>Identifying Band</u>	<u>Legend</u>
Cold Water	Green	C.W.
Hot Water	Orange	H.W.
Hot Water Return	Orange	H.W.R.
Gas	Yellow	G.
Compressed Air	Aluminum	C.A.

B. Equipment identification:

1. Stencil equipment with identifying numbers, nomenclature, and/or system number. Submit list of proposed equipment identification language for review. Equipment to be identified includes pumps, water heaters, and boilers.



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SECTION 15.500 FIRE PROTECTION

PART 1 GENERAL

1.1 SCOPE:

- A. Provide all labor, materials, equipment, services, and related work to complete the automatic fire sprinkler work within the full intent of the drawings and these specifications.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS:

A. Plumbing and Drainage:

- 1. The 4" tee in the water service line for the fire protection supply.

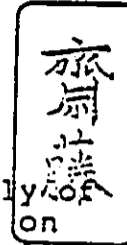
B. Electrical Work:

- 1. Alarm wiring connections to sprinkler line flow switches, along with all alarm system components.

1.3 DESCRIPTION OF WORK:

- A. Automatic fire sprinkler system to be hydraulically designed in accordance with chapter 7, NFPA Standard No. 13.
- B. Install new fire protection water service lines from the 4" tee in the water service lines provided under the Plumbing section, into the building. Install the service line through an O.S. & Y. valve and alarm check valve. From the alarm check valve install mains, branches, etc., as indicated to provide complete automatic sprinkler protection for all level areas, as required by Code.
- C. Install fire department siamese connection at the exterior wall with connection through check valve to the sprinkler system.
- D. Provide alarm check valve complete with water motor alarm gong, piping, and all accessories.
- E. Provide all sprinkler heads for all systems.

F. The items mentioned above are a general outline only of work and equipment and any work or equipment shown on the plans or specified shall be furnished and installed whether or not mentioned in the above description.



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1.4 QUALITY ASSURANCE:

- A. Comply with the requirements of the Hawaii Insurance Rating Bureau, Maui Fire Department, and the requirements of the U.B.C. Standards No. 38-1 and 38-2. Submit certification of Approval showing the work meets the above requirements to the Owner or before final payment is made.
- B. All fire protection sprinkler work shall be installed by a licensed Automatic Sprinkler Contractor.

1.5 SUBMITTALS:

- A. Submit six sets of complete shop drawings for the fire protection system within 30-days of the award of the contract. Review of shop drawings is confined to arrangement of equipment only and does not relieve the Contractor from responsibility of proper fit, performance, or construction. Shop drawings submitted for review shall bear the approval stamp of the Hawaii Fire Rating Bureau.

1.6 GUARANTEE:

- A. Provide the following guarantee:
 - 1. All equipment, accessories and material provided under this section for a period of one year from final acceptance against all defects in material and workmanship. If any equipment fails, does not operate satisfactorily or shows undue wear, remedy the defect immediately at no expense to the Owner.
 - 2. That all equipment will produce the results specified or shown.
 - 3. All piping must be drip tight and properly installed to be free of vibration, pounding or objectionable noise.
- B. The above Contractor guarantee shall not be interpreted as voiding, limiting or reducing any equipment manufacturer's warranty.



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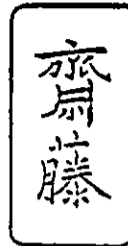
PART 2 PRODUCTS

2.1 PIPE:

- A. Underground sprinkler system lines: Cast iron pipe with mechanical joints conforming to Federal Specification WW-P-421, "Pipe, Cast Gray and Ductile Iron, Pressure (for Water and Other Liquids)", Type III, fitted with mechanical joints conforming to ANSI Specification A21.11, or to the ANSI Specification A21.8, "Pipe Centrifugally Cast in Sand-Lined Molds", Class 150, thoroughly cleaned and coated inside and out with coal tar pitch varnish.
- B. All above ground sprinkler system piping inside the building:
 1. Standard weight, black steel pipe.
 2. Thin wall, rolled groove black steel pipe with wall thickness 0.188 inches for sizes 4" through 8" and 0.120 inches for sizes 2-1/2" through 3-1/2".
- C. All drain lines: Standard weight galvanized steel pipe.

2.2 FITTINGS:

- A. Cast iron specials and fittings: Conforming to the latest standard specification and requirements of ANSI Specification A21.10, "Cast-iron and Ductile Iron Fittings, 2 inch through 48 inch, for Water and Other Liquids", thoroughly cleaned and coated inside and out with coal tar pitch varnish.
- B. All above ground sprinkler piping: Cast iron screwed or flanged fittings designed for 175 psi working pressure indicated.
- C. As an option, where permitted by the National Fire Protection Association approved victaulic fittings may be used in the sprinkler system piping.
- D. Provide welding neck flanges or flanged fittings at all flanged valves and accessories and at the first joints beyond cast iron pipe.
- E. All drain lines: Standard weight galvanized malleable iron heavily beaded fittings.
- F. No "close" nipples or street ells will be permitted.



2.3 VALVES:

- A. In the following specifications, figure numbers as manufactured by the Crane Co., are used only as a standard. Equal valves as manufactured by Kennedy Consulting Engineer Lunkenheimer Co., Walworth, or Jenkins may be installed.
- B. All shutoff valves: Fig. No. 467, O.S. & Y. Underwriter's Pattern, iron body, brass trim, flanged, designed for 200-lbs. water working pressure.
- C. All check valves: Fig. No. 375 Underwriter's Pattern, iron body, brass trim, flanged.
- D. Provide Crane No. 510 cast iron Underwriters' pattern indicator posts for all underground valves indicated as post indicator valves.

2.4 HANGERS AND SUPPORTS:

- A. Pipe hangers: Grinnell Fig. No. 260, or Fee and Mason No. 239.
- B. Riser clamps: Grinnell Fig. No. 261, or Fee and Mason No. 241.
- C. Concrete Inserts: Grinnell Fig. No. 282 or Fee and Mason No. 2570.

2.5 PIPE SLEEVES:

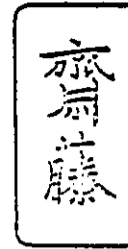
- A. Sleeves through outside walls, above and below grade: Black iron schedule 40 pipe.
- B. All other sleeves through interior walls and floors: 18-gauge galvanized iron or heavily waxed Sonoco Products Co., fiber pipe sleeves.

2.6 ALARM CHECK VALVE:

- A. Provide an alarm check valve where shown on the drawings with all necessary piping, valves, gauges, test valves, retarding device as required, etc.

2.7 ALARM GONG:

- A. Provide, where shown on the plans, a water motor operated chrome plated alarm gong with all required piping, and a flow switch with two terminals in the sprinkler line for connection to the fire alarm system by the Electrical Contractor.



2.8 SPRINKLER HEADS:

- A. Exposed locations: Spray type, rough brass finish, ordinary temperature (135°-170°F) rated.
- B. In areas with suspended ceilings: Recessed spray type, with chrome plated ceiling plates, ordinary temperature (135°-170°F) rated.
- C. Provide six spare sprinkler heads of each type, with sprinkler wrench in a cabinet to be installed where directed.

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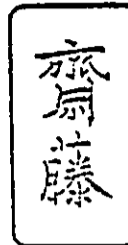
2.9 FIRE DEPARTMENT SIAMESE CONNECTION:

- A. Wilkirk Inc., No. 22-229 or equivalent unit as manufactured by Potter-Roemer, Badger-Powhatan, Sierra Fire Equipment Co., or W.D. Allen Co., flush type, chrome plated brass body, with cast in "Auto. Sprinkler" nameplate, two - 2-1/2" inlets with caps and chains, 4" outlet, integral clapper check valves, and National Standard threads.

PART 3 EXECUTION

3.1 JOINTS:

- A. Joints in underground sprinkler lines: Mechanical joints of the stuffing box type, adapted to the use of a gasket, cast iron gland, rubber gasket and bolts; "Double-X Joint", "U.S. Joint", "Boltite Joint" or "Flexklamp", designed in conformance with the governing specification for the pipe with rubber gaskets conforming to ANSI Specification A21.11.
- B. Threads on screwed pipe: Standard, clean cut and tapered. Pipe reamed of burrs and kept clean of scale, dirt and shavings. Thread made up with flaked graphite and lubricating oil or approved piping compound on the male thread only.
- C. If the option under Paragraph 2.2C is exercised, make joints with approved bolted couplings and triple-seal gaskets.
- D. Provide 18" X 18" X 18" concrete thrust blocks and tie rods on each side of all cast iron elbows and tees underground.



3.2 HANGERS AND SUPPORTS:

- A. Install hangers and supports for all pipe work to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment. Mark Saito
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- B. Refer to the structural drawings for types of construction from which piping and/or equipment is to be suspended.
- C. Supporting rod diameters for pipe: 3/8" for pipe 2" and under; 1/2" for 2-1/2" and 3" pipe; 5/8" for 4" and 5" pipe; 3/4" for 6" pipe, and 7/8" for pipe 8" and over.
- D. Spacing of hangers: On 1/2" copper lines not greater than 6'-0"; spacing of hangers on all other pipe up to 1-1/2", not greater than eight feet; on 2" and 3" pipe, not greater than ten feet; and on 4" pipe and over, not greater than twelve feet. Provide a hanger at each change of direction of the main.
- E. Support vertical lines by a hanger in the horizontal line near the riser and riser clamps at each floor.
- F. Where lines are supported from poured in place concrete slabs, joists or beams, provide concrete inserts. Where inserts support lines 8" and over or the equivalent weight, install a 3/8" deformed bar on each side of the insert, with twenty diameters imbedded in the concrete above the slab, joist or beam reinforcing steel.
- G. Where lines are supported below precast or existing concrete construction provide cinch anchors similar and equal to Phillips "Red Head".
- H. Where pipe or equipment is supported below structural steel and joist construction provide approved beam clamps, and additional structural shapes to span between beams or joists where necessary.

3.3 PIPE SLEEVES AND COLLARS:

- A. Sleeves through walls: Flush with the walls. Caulk space between pipe and sleeves outside walls below grade with lead.
- B. When pipes pass through ceilings or walls in finished portions of the building, provide approved pipe collars of sufficient size to completely cover the pipe sleeves or ceiling opening.



3.4 EXCAVATION AND BACKFILL:

- A. Place all lines in the ground straight and true in a trench having a clearance of not less than 6" and not more than 9" on each side of the pipe. Excavate trenches to the required depth, accurately to grade and the earth removed from under the bell so that the pipe rests on earth. When excess dirt has been removed bring the trench to the required elevation with earth and compact firmly.
- B. Deposit excess dirt at the building site or remove from the premises as required.
- C. Provide all shoring necessary to protect the excavation.
- D. After the installation has been tested and approved, backfill trenches and excavation in 6" layers of earth, free from clods and stones, thoroughly hand tamped to a depth of 12" above the pipe. After that depth has been reached, backfill in 12" layers thoroughly tamped. All backfill shall have a 90% compaction modified AASHO. Exercise extreme care to prevent damaging underground pipe.

3.5 SPRINKLER HEADS:

- A. Install heads in general in upright position, however where heads are located below or close to beams, install in pendant position so that piping may be installed as close as possible to the bottoms of beams.

3.6 DRAIN PIPING AND GAUGES:

- A. Install all necessary drain piping, test connections as shown or required.
- B. Provide approved gauges where necessary and as required by the National Fire Protection Association.

3.7 VALVE INDEX:

- A. Install 2" diameter brass tags, with designations as determined by the Owner, on all new valves with numbers and letters stamped or engraved thereon designating service of each valve.
- B. Furnish and mount where directed a chart with metal frame and cover, indicating location, index number and purpose of all fire protection valves.

3.8 TESTING:

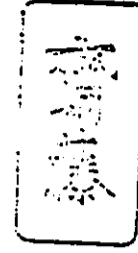
- A. Test systems in accordance with the requirements of the National Fire Protection Association.
- B. Exercise care that testing pressure do not exceed the manufacturer's test pressure of valves, equipment, etc.
- C. Notify the . Owner and Authority having control before making any tests.
- D. Remedy all leaks; caulking of screwed or flanged joints will not be permitted.



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SECTION 15.800 AIR CONDITIONING AND VENTILATION

PART 1 GENERAL



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1.1 SCOPE:

- A. Provide all labor, materials, equipment, services, and related work to complete the air conditioning, ventilating and mechanical work within the full intent of the drawings and these specifications.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS:

A. Cast-in-Place Concrete:

- 1. Concrete pads for floor mounted equipment provided under this section.
- 2. Curbs and roof openings for curb mounted fans, intakes, and vents on roof. Curbs shall be a minimum of 8" high. Verify size and location of curbs and openings for fans.

B. Miscellaneous Metal:

- 1. Access panels and doors in ceilings and walls where required for access to valves, equipment, etc. Coordinate exact locations and sizes of panels and doors to insure that proper access to all items may be attained.
- 2. Louvers in exterior walls. Install ductwork to the openings and make final connections.

C. Doors and Windows:

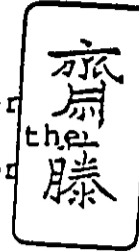
- 1. Door grilles.

D. Section 15.400 PLUMBING

- 1. Outlets and openings in the water makeup lines provided to within 2'-0" of the air conditioning equipment and capped. Outlets and openings in the drain lines provided to within 5'-0" of the air conditioning equipment. This includes regular floor drains or capped drain lines as required and/or indicated.

E. Electrical Work:

1. Installation of starters and motor control center furnished under this section shall be done under electrical section. Power wiring and conduit for motors furnished under this contract shall be installed under the electrical section.



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F. Miscellaneous:

1. Under other applicable sections of the specifications there shall be provided openings in new floors, roofs and walls for outside air intakes, exhaust discharges to the atmosphere, supplies, returns and exhaust ductwork as indicated and/or as required. Patching as may be required shall also be performed under other applicable sections of the specifications.

G. Laundry Equipment:

1. All Laundry equipment.

H. Food Preparation and Serving Equipment:

1. Exhaust hoods, filters, and hood fire extinguishing systems.
2. Water cooled condensing units.

1.3 QUALITY ASSURANCE:

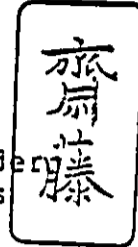
- A. Comply with the requirements of the local and state codes or regulations. Submit certification that the work meets the above requirements to the Owner or before final payment is made.
- B. Electrical work: In accordance with the National Electrical Code and the switch and starter requirements.

1.4 SUBMITTALS:

- A. Submit seven sets of equipment manufacturer's certification drawings to the for review of details. Layout shop drawings are not required unless specifically requested, or unless the Contractor requests a change from the contract drawings. Layout drawings showing requested revisions shall clearly indicate where deviations from the contract drawings are requested. Piecemeal submittal of data are not acceptable and such submittals will be returned without review.

1.5 INSTRUCTIONS FOR OPERATION:

- A. Provide a complete set of operating and maintenance manuals, covering equipment and systems installed under this section. Submit manuals no later than six months prior to completion and/or beneficial occupancy.
- B. Furnish a competent operating man for two weeks to instruct Owner's representative in proper manner to operate and maintain the system.



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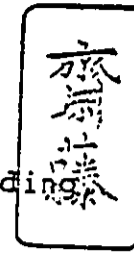
1.6 RECORD DRAWINGS AND BROCHURES:

- A. Maintain a set of marked up record drawings of the installation and upon final completion, submit reproducible copies of these drawings to the
- B. Provide complete brochure of all approved shop drawings for the project to the Owner.

1.7 GUARANTEE:

- A. Provide the following guarantee:
1. All equipment, accessories and material provided under this section for a period of one year from final acceptance against all defects in material and workmanship. If any equipment fails, does not operate satisfactorily or shows undue wear, remedy the defect and any damage to other work caused by such defect immediately at no expense to the Owner.
 2. That all equipment will produce the results specified or shown.
 3. All piping must be drip tight and properly installed to be free of vibration, pounding, or objectionable noise.
 4. That air outlets will not increase the noise level over three decibels.
 5. That the temperature control system will maintain temperatures within 1-1/2° plus or minus of the setting.
 6. That all ductwork will be air tight and properly installed.
 7. Replace all freon lost during the first year of operation.

- B. The above guarantee shall not be interpreted as voiding limiting or reducing any equipment manufacturer's warranty.



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PART 2 PRODUCTS

2.1 PIPE:

- A. The following lines shall be standard weight, schedule 40, black steel pipe:
1. All above ground chilled water lines (except runouts to individual fan-coil units)
 2. All above ground condensing water lines
- B. Underground condensing water lines: Cast iron pipe with mechanical joints conforming to Federal Specification WW-P-421c, "Pipe, Cast Gray and Ductile Iron, Pressure, (for water and other liquids)", Type III, fitted with mechanical joints conforming to ANSI Specification A21.11, or to the ANSI Specification A21.8 "Pipe Centrifugally Cast in Sand Lined Molds", Class 150, thoroughly cleaned and coated inside and out with coal tar pitch varnish.
- C. The following lines shall be hard drawn copper tubing, type as indicated:
1. All drain piping (Type "L")
 2. All cold water lines installed under this section (Type "L")
 3. All chilled water runouts to fan-coil units (Type "M")
- D. Discharge lines from the water treatment units: Stainless steel or schedule 80 PVC pipe as recommended by manufacturer.
- E. All black steel pipe 4" and over shall be welded. Smaller lines may be welded at Contractor's option.

2.2 FITTINGS:

- A. The following lines shall have standard weight, black cast iron, heavily beaded, screwed fittings:
1. All chilled water lines 3" and under, above ground, (except runouts to individual fan-coil units)



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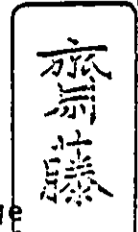
B. The following lines shall have copper or brass sweat fittings:

1. All drain piping
2. All cold water lines installed under this section
3. All chilled water runouts to fan-coil units

C. All black steel lines that are welded, shall have long radius welding tees and ells of the same wall thickness as the pipe. Welding saddles or weldolets may be substituted for welding tees where the mains and branches comply with the following schedule:

<u>Minimum Size of Mains</u>	<u>Maximum Size Branches</u>
2"	1"
2-1/2"	1-1/2"
3"	2"
4"	3"
5"	3"
6"	4"
8"	6"
10"	8"

- D. Discharge piping from the water treatment units: Stainless steel screwed fittings or solvent weld fittings as required.
- E. Unions on copper tubing: 2" and smaller, sweat ground joint; 2-1/2" and larger, sweat flanged unions with brass bolts.
- F. Unions on steel pipe: 2" and smaller; brass to iron seated, heavy ground joint; 2-1/2" and larger, flanged.
- G. Provide welding neck flanges at all flanged valves and accessories.
- H. Install unions at all screwed valve and accessory locations.
- I. No "close" nipples or street ells will be permitted.
- J. Where lines of dissimilar metals are connected, install dielectric unions.



2.3 VALVES:

A. Gate valves: Rising stem type at suction and discharge of chilled water pumps; condensing water pumps; chilled and condensing water connections to water chilling machines; and all valves 2" and smaller. Non-rising type at all other locations. Valves installed over 6'-6" from floor shall be chain operated. Gate valves on condensing water lines shall have cleanout plates.

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B. Check valves: Horizontal swing type.

C. Rising Stem Valve Schedule:

	<u>Stockham</u>	<u>Crane</u>	<u>Lunckenheimer</u>	<u>Walworth</u>	<u>Jenkins</u>
Gate 2" & under	B-107	428	2127	2	47
Gate 2-1/2" & 3"	G-620	464-1/2	1429	726	650A
Gate 4" & over	G-623	465-1/2	1430	726F	651A

D. Non-rising Stem Valve and Check Valve Schedule:

	<u>Stockham</u>	<u>Crane</u>	<u>Lunckenheimer</u>	<u>Walworth</u>	<u>Jenkins</u>
Gate 2-1/2" & 3"	G-608	460	1427	719	325
Gate 4" & over	G-612	461	1428	719F	326
Check 2" & under	B-319	37	2144	406	92A
Check 2-1/2" & 3"	G-927	372	1789	928	623
Check 4" & over	G-931	373	1790	928F	624

E. Plug cocks: Sizes 2" and smaller Homestead No. 601 or DeZurik series 100, screwed ends; 2-1/2" and over, Homestead No. 602, or DeZurik series 100, flanged ends. All cocks with dial indicators and "memory stops".

F. For valves on copper lines sweat end valves may be provided in lieu of screwed.

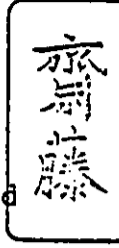
G. At the Contractor's option, he may furnish flanged body butterfly type valves with resilient seats in lieu of gate valves 4" and over specified for chilled water and condensing water lines. Butterfly valves 8" and smaller shall have lever operators. Larger valves shall have gear operators. Valve working pressure ratings shall equal or exceed those specified for gate valves.

2.4 PIPE HANGERS AND SUPPORTS:

A. Pipe hangers:

1. Horizontal steel or cast iron piping: - Grinnell Fig.

No. 260, Auto-Grip zinc plated hangers, or Fee and Mason Fig. No. 239.



2. Horizontal copper piping: - Grinnell Fig. No. 97, Auto-Grip copper plated hangers, or Fee and Mason Fig. No. 365.

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B. Riser clamps: - Grinnell Fig. No. 261, or Fee and Mason Fig. No. 241.

C. Concrete inserts: - Grinnell Fig. No. 282, or Fee and Mason Fig. No. 2570.

2.5 PIPE SLEEVES:

A. Sleeves through outside walls, above and below grade and through mechanical equipment room floors above grade: - Black iron schedule 40 pipe.

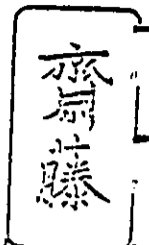
B. All other sleeves through interior walls and floors: 18 gauge galvanized iron or heavily waxed Sonoco Products Co., fiber pipe sleeves.

2.6 WATER CHILLING UNITS:

A. Hermetic centrifugal type in accordance with Air Conditioning and Refrigeration Institute Standard 550-77, Centrifugal Liquid Chilling packages as manufactured by the Carrier Corp., Trane Co., or York Corp. Capacities as indicated, with allowance for 0.0005 condensers and evaporator scaling factors. Chillers connected in series; condensers connected in parallel.

B. Compressors: Hermetic centrifugal type. Cast iron casing suitably divided to allow ready access to the rotor assembly. Readily accessible major wearing parts, main bearings, thrust bearings, seals and oil pump, for maintenance and replacement.

C. Lubricating system: Force feed type with pump supplying oil under pressure to main bearings and thrust bearing. Provide an oil filter and a water cooled oil cooler. Complete lubrication system factory mounted and piped. Heater installed in the compressor oil reservoir to prevent excessive accumulation of refrigerant in the oil during long idle periods. Crankcase heater time delay lockout of duration as recommended by the manufacturer to prevent compressor being started in the event of a power failure which affects the operation of the crankcase heater.



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- D. Capacity control: Pre-rotation vane type to regulate capacity down to approximately 10% of design load at constant speed by varying the volume of gas handled by the compressor. Provide suitable operator to automatically position the pre-rotation vanes in response to temperature control system sensing leaving chilled water temperature.
- E. Lead-Lag controls: Provide lead-lag control panel to control the two water chillers in series through entering and leaving chilled water control thermostats, with provision for selection of either manual or autostart of either machine, transfer of either machine to a lead or lag control, operating one machine at a time, alteration of chilled water temperature setpoint and with panel lights to indicate operation mode at a glance. Provide a time delay relay in the starting circuit of both chillers to prevent start-up of the lag chiller for an adjustable period of time after the lead chiller is started on initial startup. Connect time delay relay to prevent the lag chiller activation from interrupting the operation of the lead chiller. Provide a thermostat in the common chilled water return line to initiate a stop-start signal for the lead chiller to cycle off when the return water falls below 50°. This control shall be adjustable with 2 to 10° differential for field calibration and have a range of not more than 90°F. Provide a manual 2 position multi-pole switch to select the lead chiller.
- F. Refrigerant condensers:
 - 1. Horizontal shell and finned tube type designed and constructed in accordance with the ASME Code for Unfired Pressure Vessels, and bearing the seal. Steel shells with fusion welded seams. Integral finned copper tubes rolled into steel tube sheets which are to be drilled, reamed and multiple grooved to facilitate gas tight rolling. Intermediate steel tube supports provided at least every four feet. Water connections shall be standard ASA 150 psi flanges..
 - 2. Design condensers for a working pressure on the refrigerant side suitable for the refrigerant being used and 150 psig on the water side. Water velocity shall not exceed 10'/sec.
- G. Water coolers:
 - 1. Same construction as outlined for the refrigerant condenser. Eliminators shall be provided in the



coolers to insure that liquid refrigerant is not carried over to the compressor. The coolers shall be provided with a refrigerant liquid level gauge, and with a suitable relief device. Provide necessary float valves to automatically pass the condensed liquid to the water cooler.

2. Design coolers for a working pressure on the refrigerant side suitable for the refrigerant being used and 150 psig on the water side. Water velocity shall not exceed 10'/sec.
- H. Purge System: Manually started and stopped system, with necessary controls, piping, and refrigerant valves to isolate the purge system from the main refrigerant system, so that once started, the purge system shall function automatically.
- I. Prime movers: Squirrel cage induction motors of the hermetic or open type. Sufficient size to efficiently fulfill the compressor brake horsepower requirements. The full load K.W. input of any machine shall not exceed that indicated on the plans.
- J. Motor Starter: Magnetic star-delta type with transformer for control voltage. Provide incomplete sequence protection for starters. Provide size 1 starters for the purge unit, oil pump, etc., with control transformer and pushbutton. All electrical wiring, starters, etc., for the units including the oil heater and purge unit shall be factory or field installed and pre-wired so that only one electrical connection must be made to the machine.
- K. Minimum safety control requirements:
1. Low pressure cutout
 2. Low chilled water temperature cutout switch
 3. Vapor proof differential pressure switches for each chiller evaporator and condenser
 4. High pressure cutout switch
 5. Low oil pressure cutout switch
 6. Low refrigeration temperature cutout



L. Control center: Factory or field internally wired and piped for connection to system to include the following:

1. Chilled water temperature controller with control point adjustment
2. Compressor start-stop pushbutton switch and operating signal light
3. Automatic-manual capacity control selector switch and pre-rotation vane or damper manual operating switch
4. 4-1/2" dial pressure gauges for refrigerant evaporator pressure and condenser pressure and compressor lubricant pressure
5. Purge unit power switch
6. Current controller with selector switch for 40% to 100% full load amperes
7. Running hour meter
8. Ammeter

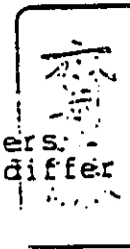
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M. Accessories:

- (1) Valved bypass liquid refrigerant filter-dryer and sight glass.
- (2) Provide domestic water piping, valves and fittings required for oil cooler and purge unit. Chilled water or condensing water may be used, but these requirements will be over and above the capacities specified.
- (3) Initial charge of refrigerant and oil.
- (4) Complete operation instructions for the centrifugal water cooling system.

N. Testing: Supervision of the pressure testing, evacuation, dehydration, charging, and initial start-up by factory trained representative of the centrifugal equipment manufacturer. This representative shall be furnished for a minimum period of three consecutive normal working days and shall concurrently instruct the Owner's operating personnel during this period.

- O. The machines shown on the plans have two pass chillers and two pass condensers. If the machines selected differ from this, submit revised plans and make necessary changes in the piping without additional cost.



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2.7 COOLING TOWER:

- A. Baltimore Aircoil Co. Inc., blow-thru "V-line" type factory assembled cooling tower, of the sectional counterflow type, constructed of hot dip galvanized steel throughout with all holes and cut edges given an added protective coat of zinc-rich compound and finished inside and out with zinc chromated aluminum paint. Capacity as indicated.
- B. Fan sections: Hot dip galvanized steel panel construction, forwardly curved centrifugal fans, statically and dynamically balanced. Self aligning heavy duty ball or sleeve type bearings with grease or oil fitting. Inlet screens having quick-disconnect fasteners shall be provided for protection and easy access to fans and bearings. Fan motors shall be three-phase, 60-Hertz, two-speed, single winding, open drip-proof, conforming to NEMA Standards, mounted on adjustable base. Multi-V-belt fan drives shall be designed for not less than 150% of the motor nameplate horsepower, protected with an enclosing belt guard.
- C. Basin: Bottom, ends, and sides constructed of heavy gauge frames with hot dip galvanized steel panels. Standard accessories, including access doors, large area lift-out strainer with closed top to prevent cavitation, waste water bleed line with valve, and brass makeup valve with large diameter plastic float ball arranged for easy adjustment.
- D. Casing above pan: Constructed of not less than 12-gauge hot dip galvanized steel. Provide horizontal discharge plenum to accommodate discharge ductwork.
- E. Wet deck surface: MNA wave-formed in shape for optimum heat transfer.
- F. Spray tree: Hot dip galvanized steel header with removable galvanized steel branches, supported in place with steel angles and clamps, plastic spray nozzles held in place with snap-in rubber grommets, and provision for measuring spray pressure externally. Pressure drop through spray header shall not exceed 5.0 psig.



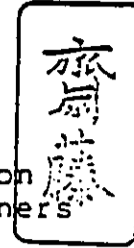
- G. Eliminators: Extra heavy coated hot dip galvanized steel, removable in easily handled sections, with a minimum of three breaks with a hooked leaving edge to direct discharge air away from the fans at a 45° angle.
- H. Provide factory fabricated intake and discharge sound attenuator sections.

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2.8 PUMPS:

- A. Type L as manufactured by Pacific Pumping Co., Type FC as manufactured by Chicago Pump Co., Type 1510 as manufactured by Bell & Gossett, or Wienman Type GB or KB, with capacities as indicated.
- B. Pumps with the selected impeller size near the maximum possible impeller size will not be accepted. Pumps shall not overload the motor at any point on their performance curves.
- C. Pump casings: Cast iron structurally designed for 125 p.s.i. working pressure with bronze wearing rings, air vent cocks at high points, and ASA 125 psi suction and discharge flanges with tappings for gauge connections. Where pumps are insulated, provide extensions to locate vent cocks outside the insulation.
- D. Pump shafts: Stainless steel, 303, 18-8 series or carbon steel furnished with renewable stainless steel sleeves extending through stuffing box, with mechanical seals.
- E. = Impellers: Fully enclosed, bronze, hydraulically and dynamically balanced. Select impellers at least one size smaller than the maximum impeller size for the casing.
- F. Mechanical seals: Provide two additional sets of seal wearing parts for each pump. Provide cold water piping connections with solenoid valves for condensing water and standby pumps for seal lubrication.
- G. Bedplate: Cast iron or fabricated steel with raised lip and drain tappings extending under both pump and motor. Carefully level, grout, and bolt bedplates in place on foundations. Alignment of the pumps shall be checked by the manufacturer's representative.
- H. Couplings: Flexible type which impose no restriction on normal end play or expansion.
- I. Provide eccentric reducers at the suction and discharge

of each pump if necessary to accomplish the reduction from line size to pump flange. Check valves, strainers and gate valves shall be line size.



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2.9 STRAINERS:

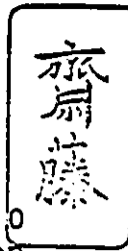
- A. Provide "Y" type strainers ahead of the chilled water and condensing water pumps with bronze strainer baskets with not larger than 1/16" perforations. Provide 3/4" valved flushing lines from the bottom of each strainer.

2.10 EXPANSION TANK AND ACCESSORIES:

- A. Expansion tank: ASME construction built for 125-lbs. working pressure, provided with gauge glass, cocks, connection in the bottom with airtrol fitting, 1/2" plugged valve in top, and 1/2" drain valve in bottom.
- B. Accessories: Relief valve, strainer, and pressure reducing valve with valved bypass in the cold water makeup to the chilled water system.

2.11 WATER TREATMENT EQUIPMENT:

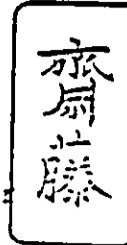
- A. Provide a bypass type chemical feeder of two gallon capacity for the chilled water system as manufactured by National Aluminate Corp., No. 10-200, or type "HV-2" as manufactured by Dearborn Chemical Co.
- B. Provide, in the mechanical equipment room, a water treatment system for the condensing water system as manufactured by Neptune Chemical Pump Co., Milton Roy Co., or National Aluminate Corp.
- C. The condensing water treatment systems shall be fully automatic in operation Dearborn Chemical Co., system SH502 or approved equal including a Flo-Thru Probe with condensing water sensing piping from the condensing water pump discharge and suction lines, control panel to control system automatic solenoid bleed valve, sense and indicate alarm for low solution tank levels, along with control wiring from the control panel in the equipment room with necessary controls to start and stop the treatment agitators and pumps.
- D. Chemical storage tanks: PVC lined, 50-gallons, with supporting legs, sight glass, and motor driven agitator. Provide stainless steel strainer between the tank and pump.



- E. Pump units: Simplex type, capable of adjustment from 0-100% while in operation, with minimum capacity of 1.0 GPH at 150 psi pressure each; double ball check suction and discharge valves, check and gate valves on the discharge. All metal in contact with the solution shall be stainless steel or P.V.C. Mark Saito
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- F. Motors: 120-volt, single phase, 60-Hertz.
- G. Provide a twelve month supply of water treatment chemicals necessary for treatment of the chilled water and condensing water systems, and during this twelve month period, assume responsibility for proper introduction of these treatment materials into the system, and provide inspection, twice monthly of the feed systems and take water samples, test, and provide analysis reports to the Owner prepared by a qualified graduate chemist or chemical engineer

2.12 AIR CONDITIONING UNITS:

- A. Factory built units as manufactured by McQuay Co., Trane Co., York Corp., Carrier Corp., or Westinghouse Corp., complete with insulated casings, fans, motors, drives, belt guards, coils, filters, and face and bypass dampers. Air handling performance certified in accordance with ARI Standard 430-74; cooling coil performance certified in accordance with ARI Standard 410-72. Capacities as indicated.
- B. Casings: Welded structural steel frame with enclosure panels fabricated of not lighter than 16 gauge steel, access panel in fan sections, internally insulated with a minimum of 1" thickness of fiberglass insulation, all joints sealed water tight, and factory applied exterior prime coat finish.
- C. Drain pans: Galvanized steel insulated with either double thickness of fiberglass, or with single thickness of internal foamed plastic with troweled mastic finish.
- D. Fans: Double inlet forward curved blade centrifugal type mounted on a turned, ground, and polished shaft, driven through V-belt drive with adjustable motor sheave. Fan blades which are riveted to fan wheel are not acceptable. Self-aligning sleeve or ball type bearings with extended lube lines to the coil connection side.
- E. Coils: Constructed with aluminum fins bonded to copper tube primary surface with supply and return connections



on the same end. Minimum 0.020" tube wall thickness; minimum 0.0075" fin thickness. Fin spacing not closer than 8 fins per inch. Seamless copper tubing or cast iron headers with 1/8" air vents and with return bends silver soldered into copper headers, or rolled into cast iron headers. Test water coils to 250 psi hydrostatic pressure. Submit all coil calculations or ARI certified computer calculation print outs. Calculate coil row requirements including a 1.05 (5.0%) safety factor.

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- F. Dampers: Oppose acting, fabricated of galvanized steel, with damper rods rotating in nylon bushings; neoprene gaskets sealing entire perimeter of each blade when closed.
- G. Filters: Filter box with 2" thickness filters arranged in "flat" or "angular" placement as indicated, with permanent filter media holding frames with replaceable media pads, Farr Co., type D, C-22 or approved equivalent. Select number of filters to provide air flow rate not exceeding 3 cfm per square inch.
- H. Motors: Open, drip-proof type for all units, 1750 RPM, 60-Hertz positioned on units as shown on the drawings.

2.03 HORIZONTAL, DIRECT DRIVE FAN-COIL UNITS:

- A. Provide ARI certified fan-coil units as manufactured by Trane Co., Carrier Corp., McQuay Inc., or York Corp., complete with insulated cabinets, coils, fans, direct drive motors, insulated condensate pan, and filters. Capacities as indicated.
- B. Horizontal, ceiling suspended type with discharge duct collar, drain pan extension, insulated intake plenum with filters and intake duct collar, and remote, wall mounted thermostat and fan speed control switch mounted on a common sub-base.
- C. Cabinets: 18-gauge furniture steel cabinets internally insulated with 1/2" thickness of fiberglass insulation, finished with factory applied prime coat.
- D. Coils: Plate fin type fabricated with copper tubes and aluminum fins, and provided with key operated air vent.
- E. Motors: Multi-speed, or variable speed, permanent split capacitor type, with built-in overload protection, resiliently mounted, and designed for 120 volt, single phase, 60-Hertz, electrical characteristics.



F. Filters: Fiberglass, 1" thickness, throwaway type.

G. Accessories:

(1) Valve package including motorized, two position three-way valve (selected for 3 to 5 psi pressure drop), balancing valve, and manual shutoff valves.

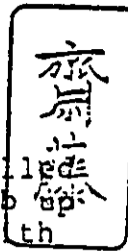
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H. Noise criteria: Units shall be sound tested based on ARI Standard 443-71, and the May 30, 1968 ASHRAE recalibration of the reference sound source. Submit sound power data for all size units required. When operating at high speed, the unit sound power levels, for all sizes required, measured in Db re 10-12 watts shall not exceed the following levels at the center band frequencies indicated:

	<u>Octave Band Center Frequencies</u>							
	<u>63</u>	<u>125</u>	<u>250</u>	<u>500</u>	<u>1000</u>	<u>2000</u>	<u>4000</u>	<u>8000</u>
Max. unit SPL	63	57	54	50	48	46	45	44

2.14 VERTICAL FAN-COIL UNITS (GUEST ROOMS):

- A. Provide ARI certified, vertical fan-coil units as manufactured by Trane Co., Carrier Corp., McQuay, Inc., or York Corp., complete with insulated cabinets, coils, fans, direct drive motors, insulated condensate pan, filters, and factory installed and insulated water and drain riser piping. Capacities as indicated.
- B. Standard cabinet type with supply and return grilles, and unit mounted thermostat and fan speed control switch.
- C. Cabinets: 18-gauge furniture steel cabinets internally insulated with 1/2" thickness of fiberglass insulation, finished with factory applied prime coat.
- D. Coils: Plate fin type fabricated with copper tubes and aluminum fins, and provided with key operated air vent.
- E. Motors: Multi-speed, or variable speed, permanent split capacitor type, with built-in overload protection, resiliently mounted, and designed for 120 volt, single phase, 60-Hertz, electrical characteristics.
- F. Filters: Fiberglass, 1" thickness, throwaway type.



G. Riser piping: Type "L" hard drawn copper tubing chilled water and condensate drain risers, designed to absorb up to 1" vertical expansion or contraction, insulated with factory installed flexible foamed plastic insulation with 3/4" thickness on chilled water risers, and 1/2" thickness on condensate risers. Mark Saito Consulting Engineer

H. Grilles: Same as grille types specified under the "Air outlets and Control Devices" articles in this section. Double deflection type supply grilles, single deflection return air grilles, hinged with lock, to provide easy access for repairs and replacement of all internal components. Where units supply multiple outlets directly from the cabinet provide grilles with registers at each outlet, and provide internal line-of-sight baffles between discharge openings.

I. Accessories:

- (1) Valve package including motorized two-position three-way valve (selected for 3 to 5 psi pressure drop), balancing valve, and manual shutoff valves.
- (2) Provide outside air intakes for units where shown on the drawings with aluminum weatherproof wall intake boxes, bird screen louvers; and provide outside air and return air dampers in unit cabinet.

2.15 HORIZONTAL BELT DRIVEN FAN-COIL UNITS:

- A. Provide McQuay, Inc., type "SCB" or approved equivalent, belt drive fan-coil units complete with insulated cabinets, coils, fans, motors, adjustable V-belt drive, insulated condensate pan, and filters. Capacities as indicated.
- B. Cabinets: 18-gauge furniture steel cabinets arranged for horizontal ceiling suspension mounting, with discharge-duct collar, intake plenum with filters and intake duct collar, 1" thick internal fiberglass insulation, and factory applied exterior prime coat finish.
- C. Coils: Plate fin type fabricated with copper tubes and aluminum fins, and provided with key operated air vent.
- D. Single phase motors: Permanent split capacitor type, with built-in overload protection, resiliently mounted, and designed for 120 volt, single phase, 60-Hertz, electrical characteristics.



- E. Three-phase motors: Resiliently mounted, 1750 RPM, 60-Hertz, squirrel cage motors with voltage characteristics as indicated.

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- F. Noise and capacity criteria: Submit performance data certifying that all units will deliver air and cooling capacities specified, along with noise spectrum of the units. Provide the next size larger unit, if necessary, to conform to capacity requirements.

2.16 IN-LINE CENTRIFUGAL FANS:

- A. Tubular centrifugal, AMCA Certified, belt driven, or direct driven as indicated, class I construction with backward inclined blades, Loren Cook Co., type CV, Penn Ventilator Co., Model REX, or Greenheck Model SQ. Capacities as indicated.
- B. Provide adjustable motor sheaves and belt guard for belt driven fans, and ceiling or wall mounting supports as indicated with vibration isolators.
- C. Motors: 60-Hertz, 40°C, 1750 RPM, constant speed, sleeve bearing or ball bearing, squirrel cage motors. If motors and drives are mounted internally, provide access panel in housing.

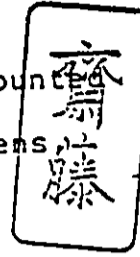
2.17 VENT SETS:

- A. Centrifugal utility vent sets, AMCA Certified, class I construction, belt driven or direct driven, as indicated, with housing, backward inclined curved fan blades, motors, and drives as manufactured by American Blower Corp., Trane Co., McQuay Co., or Chelsea Co. Capacities as indicated.
- B. Provide adjustable motor sheaves and belt guards for belt driven fans, removable weatherproof motor and drive enclosure for fans in exterior locations, and mount all fans on vibration dampening pads.

2.18 CENTRIFUGAL ROOF EXHAUSTERS:

- A. Belt driven units: Carnes Model ERBA, Jenn-Air type BDR, Greenheck type CBE, or Penn Ventilator Co., "Domex".
Direct drive units: Carnes Model ERDA, Jenn-Air type CR, Greenheck type CE, or Penn Ventilator Co., "Domex".
Capacities as indicated. All units to be AMCA certified.

- B. Provide all units complete with fans, resiliently mounted motors, disconnect switches, heavy gauge corrosion resistant aluminum housing, aluminum mesh bird screens, and adjustable motor sheaves for belt driven units.



2.19 AXIAL ROOF EXHAUST FANS:

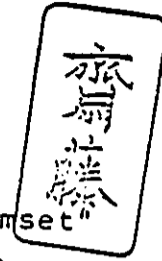
- A. Belt driven axial supply fans, Carnes type AXB5 or equivalent, AMCA Certified, units as manufactured by Trane Co., Ilg Ventilator Co., or Greenheck Co., complete with fans, resiliently mounted motors, disconnect switches, heavy gauge corrosion resistant aluminum housing, aluminum mesh bird screen, and adjustable motor sheave. Capacities shall be as indicated.

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2.20 DUCTWORK AND ACCESSORIES:

- A. Provide all supply air, return air, exhaust air and outside air ducts with necessary elbows, dampers, etc.
- B. Fabricate ductwork as recommended in the SMACNA "Low Velocity Duct Construction Standards", latest edition.
- C. Ductwork material:
1. Air conditioning and ventilating system supply, return air, outside air, and exhaust ductwork: - Lock forming quality galvanized steel with galvanized coating of at least 1-1/4 ounces per sq. ft., both sides.
 2. Dishwasher exhaust ductwork: - 20 gauge stainless steel.
 3. Kitchen range hood exhaust ductwork: - 16-gauge black steel, all welded joints, constructed in accordance with requirements of NFPA pamphlet No. 96, with access panels for cleaning, and 1" mineral wool batt exterior insulation reinforced with wire and covered with 22 gauge galvanized sheet metal.
- D. Duct hanger supports:
1. For ductwork supported from new poured concrete slab construction: - Grinnell Co. Inc., Fig. No. 282 inserts or equivalent.
 2. For ductwork supported from precast concrete or existing concrete construction: - For ducts over 84"

in perimeter provide Phillips "Red Head" or equivalent cinch anchors; for smaller ducts "Ramset" studs may be used.



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3. For ductwork supported from structural steel construction, use approved beam clamps. Provide additional structural shapes to span between beams or joists where necessary.

E. Volume damper operators:

1. Young Regulator Co., No. 1, or Ventfabrics Inc., No. 688.
2. Where damper operators must be placed in remote or concealed locations provide Young Regulator Co., No. 325 or Ventfabrics Inc., No. 677 concealed operators with flush plate.

F. Flexible connections at equipment:

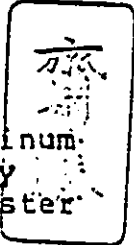
1. At locations protected from weather: - Ventfabrics Inc., "Ventglas" neoprene coated glass fabric prefabricated connections.
2. At exterior locations: - Ventfabrics Inc., "Ventlon" hypalon coated glass fabric prefabricated connections.

2.21 FIRE DAMPERS:

- A. Fire dampers in ducts passing through fire rated partitions or floors: Air Balance, Inc. "Fireseal" Model No. 118B for rectangular low velocity ductwork; Model No. 118C-RC for rectangular high velocity ductwork; and Model No. 118C-RD for round ductwork. Provide access panels in adjacent ductwork for resetting purposes.
- B. Fire dampers required at all supply air, return air, and exhaust air registers through fire rated walls and ceilings: Carnes Model L-70H or L-70V, or approved equal with steel channel frame, 16-gauge blade, 160°F. U.L. approved fusible link and phosphor bronze locking spring.

2.22 AIR OUTLETS AND CONTROL DEVICES:

- A. Square and rectangular ceiling diffusers: Carnes type 47, Barber-Colman type SFS, Tuttle & Bailey type AM, or Titus Mfg. Co., type TDC, extruded aluminum diffusers with removable core sections, approved opposed blade volume controls, and throw pattern as indicated.

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- B. Supply registers: Barber-Colman type GMA, with aluminum frame; Titus Mfg. Co., Model 1707-35; Tuttle & Bailey series VF; Carnes Co., Model 6702A; or Waterloo Register Co., type 2250 "Rotocore" grilles with opposed blade dampers. Provide adjustable "deflectrols" in supply takeoff branch ducts to all supply registers.
- C. Return air, outside air, and exhaust air grilles and registers: Barber-Colman Co., Model GMS with S core and aluminum frame; Carnes Co., Model 6704A; Tuttle & Bailey series VF; Titus Mfg. Co., Model 1700; or Waterloo Register Co., type 325 with 5° fins, key operated. Volume dampers if furnished shall be factory finished in baked black enamel or other equally suitable finish.
- D. All units: Provide with a sponge rubber gasket to prevent smearing. All ferrous metal parts and accessories prime coat finished. Provide necessary angle frames for all air outlets.
- E. Air outlets shown on the plans are for estimating purposes only. Size and guarantee all outlets for the amount of air shown and for the condition prevailing at each outlet.
- F. Submit a schedule for all devices indicating location (room name and/or number), manufacturer's model number, size, air quantity, neck or face velocity, pressure drop, sound power level values, and finish.

2.23 THERMOMETERS:

- A. Provide dial type mercury actuated thermometers as manufactured by Trerice Co., or Palmer, with stems set at the required angles, 3-1/2" stems with thermometer wells for liquid thermometers, and remote bulbs for duct thermometers.
- B. Thermometer location and dial size schedule:
1. Condensing water flow and return at condensers 0° to 160°, 6" dial.
 2. Chilled water flow and return at chillers and at air conditioning units, 0° to 100°, 6" dial.
 3. Supply ducts from all air conditioning units. 4-1/2" dial, 0° to 100°.
- C. All dial thermometers exposed to the weather shall have stainless steel casing and be weatherproof.



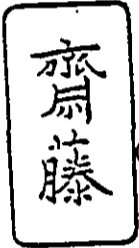
2.24 GAUGES:

- A. Piping system pressure gauges: Ashcroft Fig. No. 1010, Trerice No. 600, or Marsh No. 100. MORIKI Saito
Consulting Engineer
- B. Piping system compound vacuum-pressure gauges: Ashcroft Fig. No. 1014, Trerice No. 600, or Marsh No. 100.
- C. All piping system gauges: White dial face and black needle, installed with gauge cocks and "snubbers".
- D. All pressure gauges and compound vacuum-pressure gauges exposed to the weather shall have stainless steel casing and be weatherproof.

2.25 INSULATION:

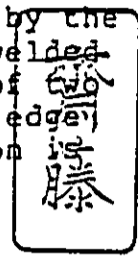
- A. All insulation installed for the project mechanical systems shall provide a UL flame spread rating not to exceed 25, and a smoke developed and fuel contributed rating not to exceed 50.
- B. Insulation for all above ground insulated pipe: Owens Corning Fiberglass heavy density sectional with All Service Jacket, vinyl-scrim-reinforced, with Self-Sealing Lap, and with factory-applied adhesive butt-joint strips, for all hot, cold, concealed and exposed pipes; insulation to be of the thickness indicated below, applied in accordance with manufacturer's recommendations, with all self-sealing adhesive firmly pressed into place with a nylon tool provided for that purpose. Provide mitered sections at all elbows and fittings, finished with a skim coating of insulating cement, OCF Fitting Mastic, and reinforcing fabric. On all pipe sizes over three inch, provide solid foam insulation blocks of length equal to at least one and one-half the pipe diameter under all pipe carriers, with metal saddles. After testing and making tight, insulate the above ground piping with insulation thickness indicated:
1. All chilled water flow and return piping (1-1/2")
 2. All air conditioning drain piping (1")
 3. All gauge cocks, hose cocks, thermometer wells, pressure taps, and other similar appurtenances on insulated pipe systems (1")

- C. Provide galvanized sheet metal protective saddles at each hanger or support on insulated piping, 6" longer than 1/2 the insulation outside diameter and curved to conform to the insulation. Metal saddles on pipe up to and including 2-1/2", No. 16-gauge; 3" to 10" inclusive, No. 14-gauge.
- D. Insulate chilled water pumps with 1-1/2" thickness of 3 lb., density fiberglass sections cut to conform to the pump surface and finished with vapor barrier mastic. Top section shall be removable at the pump casing flange.
- E. Insulation on the pump strainers shall be removable at the head so that the top of the strainer can be removed.
- F. All insulated piping, valves, and fittings exposed to weather: Cover with weatherproofed aluminum jacketing, as manufactured by Childers Products Co., P.O. Box 7065, Los Angeles, California, or approved equivalent fabricated from T/3003(3S) .016 gauge aluminum with factory attached moisture barrier (30-90-30 duplex waterproof asphalt laminated paper).
- G. Insulate all above ground supply and return ductwork and outside air-return air plenums with 1" thick 1-1/2 lb. density coated duct liner attached to the surfaces with 100% coverage of adhesive. Provide metal fasteners with large washers at least 16" center to center and a maximum of 8" from any edge or side of duct. Apply a thick coating of approved sealing compound on the exposed end and a maximum of 2" back from the edge of liner and all edges that might be eroded by air stream. At entrance to ducts, after the flexible joint, provide a metal clamp to hold the edge of the insulation in place.
- H. Sizes shown on the drawings of all ducts insulated on the inside are gross and include insulation.
- I. Insulation on coolers, suction to compressor, etc., on water chilling machines: Factory or field installed in accordance with manufacturer's recommendations and finished with metal jacket.
- J. Insulate the exterior of all laundry area exhaust ductwork with 1" thickness of six pound density Owens Corning type 705 fiberglass insulation with type FRK-25 facing or equivalent attached to the surfaces with 4" wide strips of Benjamin Foster 85-15 or Minnesota Mining & Manufacturing Co., ED-321 on 12" centers. Allow



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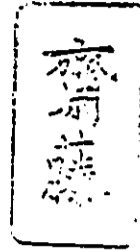
adhesive to dry for the period of time recommended by the manufacturer before installation. Provide Graham welded pins with 1-1/2" caps spaced to provide a minimum of square feet per fastener and as close to the sheet edges as possible on sides and tops. After the insulation is applied, seal all holes in the vapor barrier with pressure sensitive 4" FRK tape.



2.26 TEMPERATURE CONTROLS:

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- A. Provide a complete system of pneumatic, pneumatic electric or electric temperature control complete with all necessary thermostats, relays, valves, dampers, etc., as manufactured and installed by Johnson Service Co., Honeywell Co., Robertshaw Controls Co., or Barber-Colman Co. The temperature control system to be provided is generally described in this article of the specifications, however other information affecting this work is specified in other paragraphs of this section and familiarity with the entire section is required so that a completely integrated system is provided. The entire system shall be installed by the temperature control manufacturer.
- B. General Requirements:
1. Clearly identify, by tag or other markings, all control instruments, switches, relays, etc., as to their service. Provide a temperature control diagram and instructions for operation, framed under glass, and mounted where directed by the Engineer.
 2. Submit complete system and component data for review, including color coded wiring and/or piping diagrams; valve schedules indicating valve sizes, C.V., GPM, and pressure drop for specified flow rates; damper motor schedule indicating damper area and motor load ratings; control settings; set points; and operational description. Include air compressor size data and control device air usage information for pneumatic systems.
 3. Dampers: Oppose acting type for all modulating dampers; parallel acting type for all two position dampers. All dampers fabricated of galvanized steel, with damper rods rotating in nylon bushings, and neoprene gaskets sealing entire perimeter of each blade when closed.



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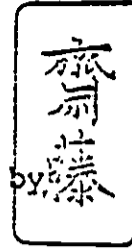
4. Damper motors: Sized for not more than 80% of catalogue ratings.
 5. Valves: Size two-position, 3-way and 2-way valves for a maximum 2.0 psi pressure drop at specified flow rates. Modulating valves shall have modulating plugs or V-ports.
 6. Thermostats: Adjustable sensitivity type, mounted on suitable bases as directed. Room thermostats to have metal fronts, concealed adjustment, unless otherwise indicated. Provide insertion type thermostats, for duct or casing installation, with extra long stems, element located in air stream, and mechanism in accessible location. Room thermostats shall be mounted 60 inches above the floor unless otherwise indicated.
 7. See fan-coil unit specifications for items provided. Connect automatic valves for units to close when unit fan is off.
 8. All control system components, wiring, tubing, etc., shall be concealed in finished spaces.
- C. Pneumatic system criteria:
1. Air compressors: Provide two compressors with 480 volt, three-phase 60-Hertz, 1750 RPM motors where shown, each selected for 1/3 operation, at 80 psi pressure; 80-gallon tank with automatic drain trap and relief valve, pressure switches, motor starters, conduit, and wiring. Provide an alternator to alternate compressor operation, and two filters and refrigerated air cooler on the high pressure line from the tank.
 2. Piping system: System to be two pipe relay system. Use metallic tubing in all inaccessible concealed locations and in mechanical equipment rooms. Nonmetallic tubing may be provided in all other accessible areas. Test piping system to 30 psi for not less than 1-hour with not more than a one-pound pressure drop. Provide a 2" air gauge (0-30 psi range) to indicated controlled line pressure between each controller and operator.
 3. Damper motors: Metal diaphragm or rubber bellows type. Provide positive positioning motors at all modulating dampers.



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- D. Electric-Electronic system criteria:
 - 1. Wiring and conduit: Entire installation by temperature control manufacturer.
 - 2. Control device motors: Gear-train, spring return type or electric, hydraulic spring return type.
- E. Provide control components located and installed to operate systems and equipment as follows:
 - 1. Typical Single Zone A.C. Unit:
 - a. Provide a room thermostat to control the unit face and bypass dampers to maintain room condition. Provide modulating damper motor for dampers.
 - b. Provide two position 3-way diverting valve in chilled water piping to coil. Valve shall be N.C. to coil and interlocked with face and bypass damper operation to close to the coil when the face dampers are fully closed, or when the unit fan motor is off.
 - c. Outside air and return air dampers shall be fixed position set for cfm indicated on plans.
 - 2. Typical Multi-Zone A.C. Unit:
 - a. Provide room zone thermostats to control the zone face and bypass dampers to maintain room condition. Provide modulating damper motors for zone dampers.
 - b. Provide two position 3-way diverting valve in chilled water piping to coil. Valve shall be N.C. to coil and interlocked with face and bypass damper operation to close to the coil when the face dampers are fully closed, or when the unit fan motor is off.
 - c. Outside air and return air dampers shall be fixed position set for cfm indicated on plans.
 - 3. Water Chilling System:
 - a. If the compressors selected use pneumatic motors for the vane controls, the thermostats will be furnished by the compressor manufacturer.

Connect the thermostats and relays furnished by the compressor manufacturer.



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4. Cooling Tower:

- a. Provide an electric two position thermostat in cooling tower sump to sense leaving condensing water temperature to energize second stage (low speed) cooling tower motor.

5. High Limit Thermostats:

- a. Provide high limit thermostats set at 125° or 135° at the return plenum of all air conditioning units and at the suction of all exhaust fans to stop the fans on high temperature.

F. Testing, Calibration and Acceptance:

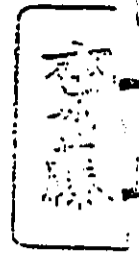
1. After completion of control and instrument wiring, connect, test, adjust, and readjust as necessary, all control equipment in terms of design, function, system balance performance, and otherwise make ready for air conditioning and ventilation systems acceptance tests.
2. Check the calibration of instruments. Any instrument not in calibration, shall be recalibrated to function as required, or shall be replaced.
3. Provide all special tools required for the operation and adjustment of controllers, instruments, or other control system devices.

2.27 MOTOR CONTROL CENTER AND MOTOR STARTERS:

A. Motor Control Center:

1. Provide motor control center as manufactured by Westinghouse, General Electric, Cutler-Hammer, Allen-Bradley, or Square D, complete with cabinet, starters, interlocks, pushbutton stations, relays, pilot lights, and accessories.
2. Construction standards: Each component, as well as the complete control center, designed, manufactured and tested in accordance with NEMA Standards For Industrial Control, NEMA Class II, type C. Bus bracing designed for a 90,000 ampere symmetrical fault. Cabinet to be completely front accessible,

90" high, 20" deep, and length as required, with exterior baked enamel finish. Provide additional compartment at the end of the unit of sufficient capacity for relaying.



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3. Wiring and connections: Factory installed power wiring from the bus bars to the line terminals of the individual units, and load and control wiring to terminal blocks for size 3 or smaller starters and control wiring for size 4 and 5 starters, with terminal blocks located at top or bottom of section. Interwiring provided between starter and control assemblies in a single section or between sections. Provide ground bus. Arrange motor control center for bus duct entrance from the top. Provide connection diagram and main assembly drawings.
4. Starters: All three phase motor starters to be NEMA rated full voltage, non-reversing, magnetic combination starters with 3-coil manual resetting type thermal overload protection, and breakers sized for motor characteristics with interrupting capacity of 75,000 amperes. Provide magnetic operating coils for 120 volt control circuit, using a control transformer for each starter; each control transformer to have secondary fuse protection. For single phase motor control, provide single pole, magnetic contactors, NEMA size as required with pushbutton control as indicated. See "Separately Mounted Starter" article in this section for motor starter to be provided.
5. Special starter requirements: - Provide starters for cooling towers compatible with two speed, single winding, cooling tower motors with adjustable 0 to 60 second time delay relay wired to delay motor speed change.
6. Starter mounting: All units to be line plug-in "Tiltout", "Lock-out" type, built-in inter-changeable modular height combinations, with guide rails provided in the

structure for supporting and aligning the unit starter during it's removal and replacement, silver plated, pressure type line disconnecting stabs of high strength copper alloy, lock-out latch to enable padlocking the unit in the "Tilt-out" position with the stabs and the entire unit isolated from the bus, and quick captive fasteners holding the unit in place

which do not require access to the rear of the structure. Each unit shall be totally enclosed and effectively baffled to isolate any ionized gases which may occur within the unit and starter.

7. Doors: Full length hinged type, held closed by quick captive screw fasteners, designed as part of the structure, to allow closing and locking to cover open buses after starter is removed.
8. Provide transformer with primary and secondary circuit breakers and panel board for 120 volts, single phase motors and control.
9. Provide additional compartment of sufficient capacity at the end of the motor control center for relaying.
10. Two press-to-test pilot lights shall be provided for each item of equipment--green color for "on" and red for "off".
11. Provide a reverse phase and phase failure relay. This unit shall be wired into the primary circuit serving the control center through properly selected fuses. Upon a detection of a 10% phase unbalance or a reverse phase condition, all motors shall be stopped. Provide a green pilot light located on the starter section labeled "Power Normal". When a power failure occurs on any phase, light shall be de-energized and ring an alarm, located in the motor control center.
12. Provide engraved plastic nameplate under each unit and switch on the motor control center designating function and system served. Provide master nameplate 4" high X 8" wide on the control panel. Nameplate lettering will be indicated at time of shop drawing submittal for units.

B. Separately Mounted Starters:

1. Three phase starters: Same type as specified in motor control center, above.
2. Single phase starters: Full voltage, non-reversing manual type, Cutler-Hammer series 9101, NEMA 1, or approved equivalent.

PART 3 EXECUTION



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3.1 ACCESS TO EQUIPMENT:

- A. Install all control devices, specialties, etc., to provide for easy access for operation, repair and maintenance; if concealed, access doors and panels shall be provided under other sections of the specification. Coordinate installation of items where access doors and panels are required for proper access. Access is required where valves or controls are installed behind walls or above non-removable ceilings.

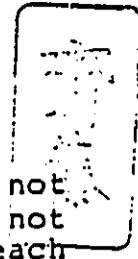
3.2 JOINTS:

- A. Threads on screwed pipe: Standard, clean cut and tapered. Pipe reamed of burrs and kept clean of scale, dirt and shavings. Threads made up with flaked graphite and lubricating oil or approved pipe compound on the male thread only.
- B. Cut copper pipe square, remove burrs and dirt, filings, etc., from the inside of the pipe. Braze all joints except runouts 3/4" and under which may be made up with 95-5 solder.
- C. Welded pipe: Weld all black steel piping 4" and over using butt welded single "V" type joints for which pipe has been beveled to 45° with welds one-fourth greater thickness than the pipe. Make connections to equipment, accessories, etc., by means of flanges or adapters.
 1. Provide a fire extinguisher, wet burlap and shield where joints are being welded.

3.3 HANGERS:

- A. Install hangers and supports for all pipe work to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment.
- B. Refer to the structural drawings for types of construction from which piping and/or equipment is to be suspended.
- C. Supporting rod diameters for pipe: 3/8" for pipe 2" and under; 1/2" for 2-1/2" and 3" pipe; 5/8" for 4" and 5" pipe; 3/4" for 6" pipe, and 7/8" for pipe 8" and over.
- D. Spacing of hangers: On 1/2" copper lines not greater than 6'-0"; spacing of hangers on all other pipe up to 1-1/2",

not greater than eight feet; on 2" and 3" pipe, not greater than ten feet; and on 4" pipe and over, not greater than twelve feet. Provide a hanger at each change of direction of the main.



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- E. Support vertical lines by a hanger in the horizontal line near the riser and riser clamps at each floor.
- F. Where lines are supported from poured in place concrete slabs, joists or beams, provide concrete inserts. Where inserts support lines 8" and over or the equivalent weight, install a 3/8" deformed bar on each side of the insert, with twenty diameters imbedded in the concrete above the slab, joist or beam reinforcing steel.
- G. Where lines are supported below precast or existing concrete construction provide cinch anchors similar and equal to Phillips "Red Head".
- H. Where pipe or equipment is supported below structural steel and joist construction provide approved beam clamps, and additional structural shapes to span between beams or joists where necessary.

3.4 PIPE SLEEVES AND COLLARS:

- A. Install sleeves of sufficient size to accommodate the pipe or pipe and insulation, where lines pass through floors or walls. Extend sleeves through mechanical equipment room floors above grade 6" above the floor; through walls, flush with the walls. Caulk space between sleeves and pipes through floors and outside walls above grade with caulking compound; below grade with lead.
- B. When pipes pass through ceilings or walls in finished portions of the building, provide approved pipe collars of sufficient size to completely cover the pipe sleeves or ceiling opening. Fasten collars on pipe that will expand or contract to the building structure.
- C. Caulk space between pipe and sleeves through the slabs and walls of all shafts that are used as air plenums.
- D. Seal all holes in walls around piping through mechanical equipment rooms with suitable resilient material to isolate pipe and to prevent sound transmission paths.

3.5 FLASHINGS:

- A. Flash and counterflash all pipe passing through the roof in an approved manner.



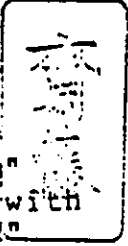
3.6 CHILLED WATER PIPING:

- A. Install all chilled water flow and return piping as Mark Saito Consulting Engine specified.
- B. Install all piping straight and true with due allowance for expansion and contraction, anchors, braces, etc. Install vertical risers, drops, stubs, etc., plumb and close to columns, partitions, or walls and supported by hanger close to riser or drop.
- C. Provide a shutoff gate valve and a 1/4" gate valve on chilled water flow to each air conditioning unit coil and a plug cock and 1/4" gate valve on each return. Connect 1/4" valves by nipple extending through insulation as near coils as possible. Provide a thermometer with well in the flow and return at each unit.
- D. Install 1/2" manual air vents at high points of chilled water flow and return mains, risers, etc., and run line to nearest floor drain.
- E. Provide a gate valve ahead of all vents. If coil headers do not vent through piping, provide a 1/8" gate valve as required.
- F. Install hose end drain valves at water chilling units, strainers, low points in mains, and at air conditioning unit coil headers.

3.7 DUCTWORK AND ACCESSORIES:

- A. Low pressure ductwork:
 - 1. Erect all supply air, return air, exhaust air and outside air ducts with necessary elbows, dampers, etc. Erect all fans, air outlets, filters, dampers, etc., furnished under other articles this section.
 - 2. Cross break uninsulated ducts 18" and larger or fabricate ducts of material two gauges heavier. Bracing on ducts 23" to 60" may be omitted if sections are 3'-0" instead of 7'-0".
 - 3. Support all vertical ducts from the floor with 1/8" X 2" bars. Support all horizontal ducts up to a perimeter of 84" from the building with double strap hangers, fabricated of 20-gauge galvanized steel straps bent to double thickness on four foot maximum centers. Ducts with a perimeter of over 84" shall be

supported on 1/4" rods and 1-1/4" X 1-1/4" X 1/4" angle, four foot maximum. Fasten angle to duct with sheet metal screws evenly spaced but not over 12" centers.


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4. Where ducts are supported below precast concrete construction, provide cinch anchors similar and equal to Phillips "Red Head" units for support of ducts over 84" in perimeter. Smaller ducts may be supported with "Ramset" studs.
5. Vane all mitered elbows and changes in direction in accordance with SMACNA recommendations.
6. Volume dampers: Up to 10" one blade; over 10" multiple blade, with dampers of at least two gauges heavier material than the duct, and blades not over 48" in length. Install volume dampers in all main ducts, branches, zones, etc., whether or not shown.
7. Punch all holes in ducts for hangers, conduit and pipe. After erection of ducts, seal openings air tight.
8. Provide flexible connections at the inlet and discharge duct connections of all fans and units.
9. Tape all joints in toilet exhaust ductwork with adhesive polyethylene cloth tape.
10. Caulk all joints, flexible connections and fittings exposed to weather, watertight.
11. Provide belt guards for V-belt drives. Submit detail for review.
12. Install exhaust "Sub-ducts" in shafts as detailed.
13. Paint bare sheet metal interior surfaces of ducts that are visible through air outlets with one coat of flat black enamel.

3.8 GAUGES AND COCKS:

A. Install gauges and cocks as follows:

1. 6" compound vacuum pressure gauge at the suction side and pressure gauge at the discharge side of the chilled water and condensing water pumps. Suction side gauges shall be 60 psi and 30 inches. Discharge



side shall be 0 - 100 psi. Mount gauges on wall behind pumps.

2. 6" pressure gauges at inlet and outlet of chillers and condensers - 0 to 100 psi (8 required).

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Chillers Engineer

B. Provide a 1/4" gate valve to be used as a gauge cock at the inlet and outlet to all cooling coils in air conditioning units.

3.9 WATER AND DRAIN PIPING:

A. From the plugged tees in the domestic water lines install the following valved connections:

1. 1-1/2" chilled water system fast fill to the chilled water return main.
2. 3/4" makeup line to chilled water return main.
3. 2" line to cooling tower.
4. 1/2" line to the seals for the condensing water pumps through gate valve, strainer, solenoid valve, and gate valve with valved bypass.

B. Provide drains from the following equipment:

1. 1" valved drains at the base of the chilled water and condensing water risers at the water chilling machines.
2. 3/4" valved drains at bottom of all basket strainers.
3. Provide drain line from drip canals on the pumps.
4. Provide drains from air conditioning unit pans terminating at the floor drains. Install drain traps with seals at least 2 inches greater than the maximum pressure in casing.
5. 1-1/2" drain and 4" overflow from cooling tower.
6. Install all air conditioning drain lines from guest room vertical fan coil units terminating in dry well pits.
7. Install 1/2" valved drains at the base of all chilled water flow risers with connections to the air conditioning drain risers.



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3.10 EQUIPMENT NOISE AND VIBRATION ISOLATION:

A. General requirements:

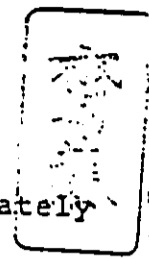
1. All mechanical equipment, piping, etc.: Mounted on or suspended from approved and specified foundations or supports.
2. All floor mounted equipment: Erected on a 4" high reinforced concrete housekeeping pad. Where vibration isolation equipment is used, extend pads beyond equipment dimensions to support the isolation system.
3. Guarantee all vibration isolation systems to have the static deflections as specified and indicated on the drawings. Install vibration isolation systems in accordance with the manufacturer's instructions.
4. Weatherproof all vibration isolation systems exposed to the weather in the following manner: All steel parts to be hot dipped galvanized, all bolts to be cadmium plated and all springs to be cadmium plated and neoprene coated.
5. All vibration isolation equipment including mountings, hangers, structural steel bases, welded concrete pouring forms and flexible pipe connectors shall be furnished by a single manufacturer of vibration isolation equipment.

3.11 ROOF MOUNTED PIPING SUPPORTS:

- A. Install structural supports for the roof mounted piping. Provide all structural steel elements, pitch pockets, etc. Weld all joints and paint with bitumastic paint after fabrication.

3.12 ELECTRICAL WORK:

- A. Furnish starters and motor control center as specified under Part 2, to the Electrical Contractor for installation. Receive, unload, handle and set all separately mounted motors and starters specified under this section of the specification. Refer to the electrical drawings for the extent of electrical work provided by the Electrical Contractor.
- B. Install motor control wiring as specified under this section of the specifications.



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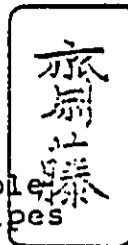
- C. Properly lubricate all motors whether they be separately mounted or attached to other equipment.
- D. Motor Control Wiring:
 - 1. Any control wiring or relays not furnished by the various equipment manufacturers is included in this portion of the specification.
 - 2. Provide motor control wiring for the water chilling units, condensing water pumps, chilled water pumps, cooling tower fans, purge compressors, etc., as required by the water chilling unit manufacturer. Interconnect the holding coil circuits as required by the compressor manufacturer for the chilled water pump, condensing water pump, standby pump, and cooling tower fans. Only one power connection will be required for each compressor.
 - 3. Install interlock wiring from the holding coil circuit of the condensing water treatment units through starter auxiliary contacts of condensing water pump.
 - 4. Connect high limit thermostats located at the inlets of all exhaust fans into their respective fan motor holding coil circuits.
 - 5. Connect high limit thermostats located at the return side of all air conditioning units into their respective fan motor holding coil circuits.
 - 6. Connect control wiring from the starter holding coil circuits of the condensing water and standby pumps to the seal lubrication line solenoid valves.

3.13 VALVE INDEX:

- A. Install 2" diameter brass or plastic tags, with designations as determined by the Owner, on all new valves with numbers and letters stamped or engraved thereon designating service of each valve.
- B. Furnish and mount where directed a chart with metal frame and cover, indicating location, index number and purpose of all air conditioning valves.

3.14 IDENTIFICATION, AND STENCILING:

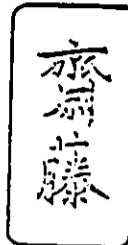
- A. Piping system identification: In mechanical equipment



rooms, crawl spaces, on roof, and all other accessible locations, provide labels identifying contents of pipes as follows:

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1. Place identifying band of color listed in the following schedule, near each valve and fitting, on both sides of pipes passing through wall, and on long pipe runs approximately every 15 feet or closer when directed.
2. Provide label on pipes near each valve, with name of pipe contents in abbreviated form as listed in Schedule under heading, "legend", size of pipe adjacent to each legend, and provide arrow next to legend indicating direction of flow in pipe. Place label legend in location so that it can easily be read from floor. Size of label letters shall vary with size of pipe, as per ANSI A 13 Standard.
3. For general purpose pipe content, valve identification, or direction of flow marking, use Brady B-500 Vinyl Cloth General Purpose Pipe Markers, Westline's WBC Vari-Temperature quality grade waterproof type markers, or approved equal. For identification of rough surface pipes or pipes wrapped with insulation, or where tamperproof identification is required, use Brady B350 Perma-Code Thin Film Pipe Markers.
4. Provide pipe markers and directional arrows on the pipe on each side where pipes pass through walls, every 15 feet along continuous pipe lines, and at every bay or aisle, and at each riser, elbow and "T" joint.
5. When using directional arrows, point arrowhead away from pipe markers and in direction of flow. If flow can be in both directions, use a double-headed directional arrow instead of a single-headed directional arrow.
6. When Brady B-350 Perma-Code thin film pipe markers are used on chalky, loose or soft insulations, a spiral wrap or Pipe Banding Tape shall be made around the pipe.
7. For 360 deg. color coding of bare pipes, painted pipes, or pipes insulated with a firm covering, use Pipe Banding Tape around each end of the pipe marker.



8. Schedule of Piping System Identification:

Service	Identifying Band	Legend
Chilled Water Flow	Blue	CH.W.F. Mark Saito Consulting Engineer
Chilled Water Return	Blue	CH.W.R.
Condenser Water Flow	White	C.W.F.
Condenser Water Return	White	C.W.R.

B. Equipment Identification:

1. Stencil equipment items with identifying numbers, nomenclature, and/or system number. Submit list of proposed equipment identification language for review. Equipment to be identified includes: Water chilling machines, pumps, cooling towers, fans, air conditioning units, reheat coils, and boilers.

3.15 CLEANING:

- A. Clean all equipment, piping, ducts and lines before leaving the work.
- B. Flush the chilled water and condensing water piping systems after it has pressure testing, and before the systems have been put into operation, as follows:
- C. Fill the condensing water systems and operate for 8 hours; clean the strainers and refill the system and operate for 8 hours. If at this time the system is not clean, repeat the procedure. Clean the cooling tower spray nozzles after one week of operation, and again 3 weeks after start of operation.
- D. Flush the chilled water system with a detergent solution as recommended by the National Aluminate Corp., or Dearborn Chemical Co.
- E. After flushing with detergent, drain, fill with clean water, and operate the chilled water system for 8 hours with the water bypassing the chillers; clean the strainers and refill the system and operate for 8 hours. If at this time the system is not clean, repeat the procedure.



3.16 TESTING AND ADJUSTING:

- A. Test all piping to 200-lbs pressure and make tight. Mark Saito Consulting Engineer
Caulking will not be permitted. Hold pressure for 2 hours with not more than a 2-pound loss.
- B. Test the air distribution systems and adjust the dampers to provide the amount of air specified and shown. Take velocity readings before each outlet, at unit dampers, coils and filters. Take static pressure readings at suction and discharge of fans.
- C. Set the automatic controls and dampers to produce the required or directed results. Check air quantities at all air outlets. Adjust air quantities at air outlets to agree with plans and specifications.
- D. Take ampere, power factor and voltage readings on the water chillers, pumps, and cooling towers under full load conditions. Take ampere, power factor, and voltage readings on all exhaust and supply fans, and air conditioning units.
- E. Adjust the water to each air conditioning unit coil and to the chillers and condensers with mercury manometer, or with venturi flow measuring equipment.
- F. Provide all instruments for measuring temperature, water flow and electrical energy. Instruments specified and installed under this contract, may be used for testing.
- G. All instruments used in testing shall be calibrated not more than thirty days previous to the test.
- H. Submit duplicate charts of all the above test results to the _____ for review.



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PRELIMINARY MECHANICAL EQUIPMENT SCHEDULE

A. WATER CHILLING UNITS (2 REQUIRED)

<u>Total</u>	<u>Chilled Water</u>			<u>Condensing Water</u>		
	<u>GPM</u>	<u>Ent.</u>	<u>Lvg.</u>	<u>GPM</u>	<u>Ent.</u>	<u>Lvg.</u>
580 Tons	1392	52°	42°	1740	85°	95°

B. COOLING TOWER

<u>GPM</u>	<u>Ent. Water</u>	<u>Lvg. Water</u>	<u>Amb. W.B.</u>	<u>Motors</u>
1740	95°	85°	78°	Two-30 H.P. (2-speed)

C. PUMPS

<u>Pump</u>	<u>No. Req'd.</u>	<u>GPM ea.</u>	<u>Head</u>	<u>RPM</u>	<u>Eff.</u>	<u>Motors</u>
Ch. Water	2	696	130 ft.	1750	75%	40 H.P.
Cond. Water	2	870	75 ft.	1750	75%	25 H.P.

D. ELEVATOR PIT SUMP PUMPS

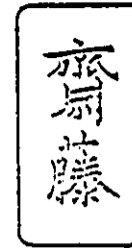
<u>No. Req'd.</u>	<u>GPM ea.</u>	<u>Head</u>	<u>RPM</u>	<u>Motor</u>
3	25	15 ft.	1750	1/3 H.P.

E. 180° H. W. HEATERS (#2 Oil Fired)

<u>No. Req'd.</u>	<u>Recovery Capacity, ea.</u>	<u>Burner Characteristics</u>
2	1200 GPH	4.0 G.P.H., 1/4 H. P.

F. 180° H. W. CIRCULATOR

<u>No. Req'd.</u>	<u>GPM</u>	<u>Head</u>	<u>RPM</u>	<u>Motor</u>
1	8	25	1750	1/6 H.P.



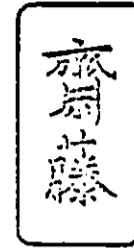
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H. HORIZONTAL FAN COIL UNITS

<u>Unit</u>	<u>Area Served</u>	<u>Unit cfm</u>	<u>Drive</u>
A	Laundry Office	200	Direct
B	Housekeeper	300	Direct
C	Time Keeper	200	Direct
D	Rec.-Purch.-Pers. Mgr.	600	Direct
E	Employee Dining	1600	Belt
F	Rm. Serv. & Office	600	Direct
G	Kitchen Control	200	Direct
H	Chef's Office	200	Direct
I	Kitchen Steward	200	Direct
J	Telephone Equip.	800	Direct
K	Chief Engineer	400	Direct
L	Health Club	3-600	Direct
M	Beauty Shop	800	Direct
N	Barber Shop	300	Direct
O	Game Room	800	Direct
P	Meeting Room	1600	Belt
Q	Meeting Room	2-1500	Belt
R	Retail Shops	4-1000	Belt
S	Gen. Store	3-600	Direct
T	Drug Store	800	Direct
U	News Shop	600	Direct
V	Sporting Goods	800	Direct
W	Hotel Offices	8-400	Direct

I. AIR CONDITIONING UNITS

<u>Unit</u>	<u>Type</u>	<u>Area Served</u>	<u>Unit cfm</u>
A	Single Zone	Coffee Shop	3000
B	Single Zone	Coffee Shop	3000
C	Single Zone	Specialty Restr.	4000
D	Single Zone	Night Club	3500
E	Multi-Zone	Main Dining	7000
F	Multi-Zone	Main Dining	7000
G	Single Zone	Ball Room	7000
H	Single Zone	Ball Room	3500
I	Single Zone	Ball Room	3500
J	Single Zone	Jr. Dept. Store	4600
K	Single Zone	Front Desk-Office	2200



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G. VERTICAL FAN-COIL UNITS (GUEST ROOMS)

<u>F.C.U.</u> <u>Unit</u> <u>Type</u>	<u>No.</u> <u>Typical</u>	<u>Unit cfm</u> <u>@ Hi</u> <u>Speed</u>	<u>S.H.</u> <u>Btu</u> <u>Ea.</u>	<u>T.H.</u> <u>Btu</u> <u>Ea.</u>	<u>GPM</u> <u>Fa.</u>
A	16	800	15,800	19300	3.9
B	109	600	10600	14100	2.8
C	18	600	13100	16500	3.3
D	4	800	18100	21500	4.3
E	27	600	12900	16300	3.3
F	4	800	15400	18800	3.8
G	120	300	7400	10900	2.2
H	2	600	10200	13600	2.7
I	31	400	9700	13100	2.6
J	1	600	11300	14700	3.0
K	10	600	10200	13600	2.7
L	2	600	11300	14700	3.0
M	1	600	10600	14100	2.8
N	13	600	13100	16500	3.3
O	3	800	15400	18800	3.8
P	108	300	6600	10100	2.0
Q	6	400	8200	11600	2.3
R	29	400	8900	12300	2.4
S	2	600	10500	13900	2.8
T	7	300	6600	10100	2.0
U	2	400	8200	11600	2.3
V	1	400	8200	11600	2.3
W	14	300	7400	10900	2.2
X	2	600	10200	13600	2.7
Y	7	400	9700	13100	2.6
Z	1	600	11300	14700	3.0
AA	3	300	6600	10100	2.0
BB	1	300	6600	10100	2.0
CC	3	400	8900	12300	2.4
DD	1	600	10500	13900	2.8

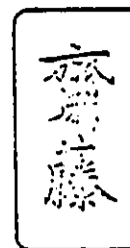


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J. EXHAUST AND SUPPLY AIR FANS

<u>Item</u>	<u>No.</u>	<u>Serves</u>	<u>Location</u>	<u>Cfm</u> <u>ea.</u>	<u>S.P.</u>	<u>Motor</u> <u>H.P.</u>	<u>Fan Type</u>
<u>EXHAUST FANS</u>							
A	3	G.R. Baths	Roof	200	1/4	1/4	Centrif. Roof Exhau
B	7	G.R. Baths	Roof	400	1/4	1/4	" " "
C	2	G.R. Baths	Roof	700	1/4	1/4	" " "
D	1	G.R. Baths	Roof	500	1/4	1/4	" " "
E	11	G.R. Baths	Roof	300	1/4	1/4	" " "
F	1	G.R. Baths	Roof	100	1/4	1/4	" " "
G	4	G.R. Kit.	Roof	200	1/4	1/4	" " "
H	1	G.R. Baths	Roof	350	1/4	1/4	" " "
I	1	Maid-Ice-Jan	Roof	2400	3/8	1/3	" " "
J	3	Maid-Ice-Jan	Roof	3600	3/8	1/2	" " "
K	9	G.R. Baths	Roof	600	1/4	1/4	" " "
L	6	G.R. Baths	Roof	1200	1/4	1/4	" " "
M	4	G.R. Baths	Roof	900	1/4	1/4	" " "
N	1	G.R. Baths	Roof	150	1/4	1/4	" " "
O	3	G.R. Baths	Roof	550	1/4	1/4	" " "
P	1	G.R. Baths	Roof	450	1/4	1/4	" " "
Q	1	Laundry	1st. Floor-Laundry	15000	1-1/4	7-1/2	In-Line Centrif.
R	1	Toilets	1st. Fl.-Near Stair #10	1400	1/4	1/3	" " "
S	1	Main Kit. Hood	-	20,000	1-1/2	15	Vent Set
T	1	Main Kit. Gen	-	10,000	1"	3	Vent Set
U	1	Emp. & Pub. Toil.	-	6000	1/2"	1-1/2	In-Line Centrif.
V	1	Health Toil.	-	800	3/8"	1/4	In-Line Centrif.
<u>A. FANS</u>							
W	1	Back of House	Bsmt. Equip Room	20,000	1"	15	In-Line Centrif.
X	1	Corridors	Roof-Stair #8	3600	3/8"	1	Axial Roof Type
Y	1	Corridors	Roof-Stair #5	5400	3/8"	1-1/2	Axial Roof Type
Z	1	Corridors	Roof-Stair #4	3000	3/8"	1	Axial Roof Type
AA	1	Corridors	Roof-Stair #1	4200	3/8"	1	Axial Roof Type

16.000 ELECTRICAL: GENERAL REQUIREMENTS

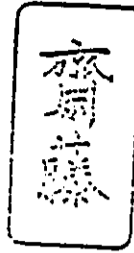


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1. GENERAL: This section applies to all other Electrical Sections.

- A. The basic electrical installation shall, in general, include all electrical work necessary for all lighting, power and electrical control systems required for building operation and will be in accordance with Design Standards. The complete electrical installation will be in accordance with the requirements of the local electrical code, the applicable building code, rules and regulations of the utility and telephone companies, and all agencies having jurisdiction. In the absence of a local electrical code, the design will in general be in accordance with the latest National Electrical Code.
- B. All required indemnification, insurance, permits and inspection certificates shall be obtained and paid for as a part of this work and made available when called for by the ..
- C. All work shall be guaranteed for one year from the date of acceptance by the Owner.
- D. Shop drawings of all equipment and systems shall be submitted for approval prior to fabrication and installation. (Six copies).
- E. Record drawings of reproducible type showing an accurate and complete record of the work as installed shall be provided.
- F. All systems shall be tested in the presence of Owner's Representatives and/or Engineers.
- G. All equipment shall be cleaned and primed where required for finish painting.
- H. Operating and maintenance instructions for all equipment and systems shall be provided.
- I. Identification for all systems and components of same shall be provided in accordance with accepted standards.
- J. All equipment to be UL tested, labeled or approved.

16.100 ELECTRICAL: ELECTRICAL SYSTEM



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Consulting Engineer

1. SCOPE OF WORK: Furnish and install all materials and equipment and furnish labor necessary for the complete operation of the electrical systems in strict accordance with the intent of the plans and specifications and subject to the terms and conditions of the Contract Documents. The work under this contract shall include, but not be limited to, the following paragraphs:
 - A. Distribution equipment including secondary switchboard, normal and emergency distribution panels, power panels, and lighting panels.

Motor control center shall be furnished under Mechanical Section, but installed under the Electrical Section.
 - B. A system of exterior and interior lighting and power wiring, including all feeders, branch circuits and connections to all lighting and power outlets, motors and appliances.
 - C. Connections to all power equipment provided under Other Sections, including motor starters, necessary remote controls, motor interlocks, float, aquastat, and pressure switch controls, and connection to electric-pneumatic switches and relays.
 - D. Ice-machine outlets.
 - E. Exhibition power.
 - F. Health club and sauna.
 - G. Exterior sign outlets.
 - H. Telex outlets
 - I. Metering in kitchen, laundry and retail spaces.
 - J. Guest room air conditioning shut off.
 - K. Dimming systems.
 - L. All general lighting fixtures and lamps.
 - M. Wiring and installation for decorative lighting fixtures, special exit and directional signs.
 - N. Complete grounding system of equipment
 - O. Complete testing of all electrical systems.



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- P. Removal of all rubbish.
 - Q. All special tools.
 - R. All rigging and hoisting including all additional shoring and bracing as required for the installation of electrical work.
 - S. All fastenings and supports.
 - T. Sleeves and inserts.
 - U. Plaster rings or frames.
 - V. Panelboards and metering for retail spaces.
 - W. Low voltage pool lighting.
 - X. Spare parts.
2. ELECTRIC SERVICE:
- A. The electric service consists of a 277/480 volt, 3 phase, 4 wire secondary service derived from Hawaii Electric and Light Company transformer and generators provided by others. The utility company transformer and the Owner's generators shall be paralleled to feed a generator switchboard, also provided by others. All work on the line side of the generator switchboard is by others, except for the primary service ducts which shall be included in the Electrical contract. The anticipated demand load for this project is 1500 KVA.
 - B. The primary electric service consists of:
 - (1) 2 - 12.47 KV underground primary feeders from the property line to the primary switch and transformer. All concrete encased ducts shall be included in the electrical contract. Cables, primary switch and transformer shall be provided by Hawaii Electric and Light Company.
 - C. The secondary electric service consists of:
 - (1) Pad mount transformer by Hawaii Electric and Light Company: 1-1500 KVA, 277/480 volt, 3 phase, 4 wire grounded wye secondary in vault type installation.
 - (2) Generators by Others: 2-850KW, 277/480 volt, 3 phase, 4 wire grounded wye secondary, deisel engine driven generators.



- (3) Generator Switchboard by Others: Switchboard shall consist of drawout type power circuit breakers with ground fault protection. Main bus shall be rated 4000A, 277/480V, 3 phase, 4 wire with a 1000 amp continuous ground bus.
- (4) Secondary Service Bus Ducts under Electrical Work: 1-2500 ampere, 277/480V, 3 phase, 4 wire aluminum bus duct from Hawaii Electric and Light Company transformer to Generator Switchboard. 1-2000 ampere, 480V, 3 phase, 3 wire with 1/4 ground aluminum bus duct from generator switchboard to building motor control center. 1-2000 ampere, 277/480V, 3 phase, 4 wire with 1/4 ground aluminum bus duct from generator switchboard to building main switchboard.
- (5) Building Distribution under Electrical Work: 277/480V feeders to each local distribution panel with individual dry-type step-down transformers, 120/208V secondary as required.

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3. MAIN SWITCHBOARD:

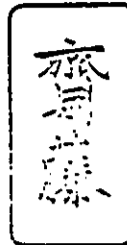
- A. Furnish and install (2500 ampere, 277/480volt, 3phase, 4 wire with 1/4 ground) main switchboard.
- B. Switchboard shall consist of two main circuit breakers with ground fault protection (normal section and emergency section) and feeder circuit breakers with ground fault protection.
- C. All circuit breakers shall be provided with solid state coordinated tripping.

4. LIGHTING AND POWER DISTRIBUTION PANELS:

- A. Furnish and install lighting and power distribution panels.
- B. Distribution panels shall utilize circuit breakers protecting feeders for power and lighting.
- C. Lighting panels shall utilize circuit breakers for all branch circuits.
- D. Panels to be mounted in steel cabinets with hinged doors.
- E. Circuit breaker shall be molded case, size and number of poles as required.
- F. 20% spare capacity shall be provided in all panels and feeders. A typed written directory and equipment ground bus shall be provided in each panel.

5. CONDUIT:

- A. Conduit shall be rigid steel hot dipped galvanized, electrical



metallic tubing (EMT), or Schedule 40 PVC where buried in earth. Concrete encased ducts shall be either PVC or ABS.

- B. EMT shall not be buried in the earth or embedded in concrete slabs on grade.
 - C. EMT may be used in exposed locations (where not subject to mechanical injury), above hung ceilings, and embedded in concrete slabs above the ground floor.
 - D. Flexible metal conduit shall be used for all final connections to vibrating equipment such as transformers and motors. Liquid tight flex shall be used in wet or damp locations.
6. WIRE AND CABLE:
- A. All wire and cable #2 AWG and smaller shall be copper, 600V, insulation type THW.
 - B. All conductors shall be color coded for identification.
 - C. Fixture wire (for connections to lighting fixture) shall be #12 AWG, stranded.
 - D. All conductors #8 AWG and larger shall be stranded.
 - E. All conductors #1/0 AWG and larger shall be aluminum. Compression type lugs or splices shall be used for all aluminum terminations.
7. FASTENINGS AND SUPPORTS: Provide inserts, anchors, supports, hangers, braces, etc., for proper installation of conduit, outlets, lighting fixtures, motor starting and control equipment, etc.
8. LIGHTING:
- A. Furnish and install all general lighting fixtures.
 - B. Wiring and installation of decorative fixtures, special exit and directional signs furnished under FF & E.
 - C. Wiring and installation of exterior lighting within 5'-0" of building.
 - D. Lighting in guest rooms: In general, by means of plug-in table and floor lamps, provided as part of the room furnishings. Entrance foyers in guest rooms shall contain incandescent fixture, switch controlled at the entrance door, bath room and vanity lighting switch controlled.
 - E. Public corridor lighting: Arranged on alternate circuits to permit low level late night lighting and partial emergency power supply.
 - F. Lighting in utility areas with fluorescent strips.
 - G. Fluorescent fixtures shall be used in kitchen, laundry, certain service areas in continuous use, and offices.

- H. Lobby lighting shall be equipped with night set back control.
- I. All site lighting will be covered under site work sections of the specifications. The electrical work will include timer, contractor controlled panels and raceways to 5 feet beyond the building for site lighting.
- J. All exposed fixture trims shall be of non-corroding material.
- K. Decorative lighting: (chandeliers, wall sconces and brackets) in all specialty areas, restaurants, lobbies and ballrooms will be furnished as part of a FF & E.



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9. DIMMING SYSTEMS:

- A. Dimmers shall be provided for lighting control in ballroom, function rooms, dining room, restaurant, cocktail lounge and bars.
- B. Dimmers shall be electronic, solid state, and derated for operation at 60°C. ambient temperature.

10. EXTERIOR SIGN OUTLETS:

- A. Furnish and install outlets to serve exterior signs.

11. EXHIBITION POWER:

- A. Furnish and install heavy duty 50 amp. 3 phase, 4 wire outlets; four in banquet room and two in prefunction room.

12. GROUNDING:

- A. Furnish and install a complete ground system as required.

13. ICE MACHINE OUTLETS:

- A. Furnish and install outlet for ice machine in each guest tower corridor.

14. TELEX:

- A. Furnish and install outlets for 4 telex machines.

15. GUEST ROOM AIR CONDITIONING SHUT-OFF:

- A. Furnish and install all wiring and conduit and install switch on guest room balcony door to shut off A.C. when door is opened. Switch shall be furnished under Mechanical Section.

16. GUEST ROOM ELECTRICAL ARRANGEMENT:

A. Furnish and install the following electrical outlets and lighting fixtures in the guest rooms.

- (1) 120 volt duplex outlets as shown on plans.
- (2) One telephone outlet.
- (3) One television outlet.
- (4) One surface mounted foyer lighting fixture.
- (5) Wall mounted fixture over mirror at lavatory and one over dressing counter controlled from one switch.
- (6) Bathroom lighting fixture controlled from separate switch.
- (7) Shaver outlet in lavatory area.
- (8) Provide low voltage wiring from micro-switch at balcony or terrace doors to control relay in room fan coil unit.

B. Each pair of guest rooms shall be wired on 2, 20 amp circuits to increase reliability of electric services.

C. Guest room foyer fixture shall be on emergency service.

D. Corridors shall be provided with vacuum cleaner twist lock receptacles on 40 foot centers. Circuit vertically with 4 receptacles per 20 amp circuit.

17. POOL LIGHTING:

A. Lighting of swimming pool and fountains shall be low voltage (12V).

18. SPARE PARTS:

A. Provide spare fuses and rack to hold same as follows: 601 amperes and larger three of each type and rating installed. 0-600 amperes, 10% of each type and rating installed (minimum set of three, maximum 2 sets).

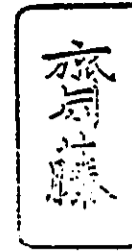
19. RETAIL AREAS:

A. Provide a check meter for the power supply into each retail area. Provide propeller type ventilating fans for each retail space, one fan per 225 square feet.



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16.700 ELECTRICAL: COMMUNICATIONS



1. SCOPE OF WORK: Furnish and install all materials and equipment and furnish labor necessary for the complete operation of the communications systems in strict accordance with the intent of the plans and specifications and subject to the terms and conditions of the Contract Documents. The work under this contract shall include, but not be limited to, the following:

- A. Telephone and television systems shall share same empty conduit, utilizing a split box at outlet locations.
- B. Empty conduit for intercom system.
- C. Empty conduit for sound system.

2. SYSTEM OPERATION:

A. Telephone System:

- (1) Provide empty conduit only for hotel telephone system.
- (2) Equipment and cables provided by others. Telephone system shall also provide wake-up service, message waiting, maid call and telex service.

3. TELEVISION SYSTEM:

- A. Furnish and install all empty conduit where required for television antenna system and in-room service.

4. SOUND SYSTEMS:

- A. Furnish and install empty conduit for the following systems:

(1) A general sound system providing background music to the public areas with paging over-ride. No paging shall be allowed in dining or entertainment areas. Areas covered by the general sound system shall include:

- (a) Main lobby
- (b) Restaurant
- (c) Dining areas
- (d) Elevator foyers



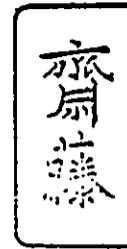
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Consulting Engineer

- (e) Telephone switchboard
 - (f) Locker rooms
 - (g) Function rooms
 - (h) Office areas
 - (i) Employees lounge
 - (j) Cafeteria
 - (k) Employees restrooms
- (2) Local sound systems completely separate and distinct from the general sound system in the following areas:
- (a) Ballroom
 - (b) Cocktail lounge
 - (c) Swimming pool area
 - (d) Function rooms
- (3) Microphone jack outlets in each local sound system area. Local sound systems shall have capabilities of interconnection with general sound system.

5. INTERCOM SYSTEMS:

- A. Furnish and install empty conduit for the following systems:
- (1) Kitchen intercom
 - (2) Receiving dock intercom
 - (3) Office intercom

16.721 ELECTRICAL: FIRE ALARM SYSTEM



1. SCOPE OF WORK: Furnish and install all materials and equipment and furnish labor necessary for the complete operation of the fire alarm system in strict accordance with the intent of the plans and specifications and subject to the terms and conditions of the Contract Documents. The work under this contract shall include, but not be limited to, the following:

- A. Conduit and wiring in accordance with Section 16.100.
- B. Control panel
- C. Manual pull stations
- D. Smoke detectors (Ionization)
- E. Air duct detectors (Ionization)
- F. Alarm bells
- G. Annunciators
- H. Connection to sprinkler system flow switches
- I. Connection to elevator controller

2. SYSTEM OPERATION:

- A. Non-coded manual, pre-signal, zoned annunciated (electrically supervised) fire alarm system. Power to be from emergency light system. Fire alarm and bell stations as required.
- B. Provide smoke detectors in return air plenums of each air handling system for fan shutdown operation. Systems control panels in electric room with remote indicating panel in Tel. oper. room.
- C. Sprinkler alarm panel with local annunciator. It shall be connected to the sprinkler flow valves and/or sprinkler heads and located in the engineer's office.
- D. Duct fire and smoke detectors as required by Mechanical Section.

SPECIAL MANAGEMENT AREA USE PERMIT APPLICATION

COUNTY OF HAWAII

PLANNING DEPARTMENT - PLANNING COMMISSION

APPLICANT: KUUIPO RESORT CONDOMINIUMS, INC.

APPLICANT'S SIGNATURE: *KuuiPO Resort Condominiums, Inc.*

APPLICANT'S INTEREST, IF NOT THE OWNER: PURCHASER

ADDRESS: C/O Sam I. Ishigo
P. O. Box 8, Honouliuli, HI. 96728

TELEPHONE: 963-6128

(business)

963-6128

(home)

OWNER: New World Investment

OWNER'S SIGNATURE: *Sam I. Ishigo*

TAX MAP KEY: 2-6-12-1,2,3

NATURE OF DEVELOPMENT: condominium and restaurant

APPLICANT'S REASON(S) FOR REQUESTING THE USE PERMIT: (Please attach)

Applicant must show that the following conditions exist:

- (1) that the development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is clearly outweighed by public health, safety, and welfare. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect and the elimination of planning options; and
- (2) that the development is consistent with the findings and policies set forth in Rule 9.1.B and 9.3, Rules and Regulations Relating to Environmental Shoreline Protection.

THIS APPLICATION MUST BE ACCOMPANIED BY:

- (1) 15 copies of the completed application form with attachments.
- (2) 15 copies of the location map.
- (3) 15 copies of a plot plan, drawn to scale, with all existing and proposed structures shown thereon.
- (4) \$100.00 filing fee.
- (5) In the case of the applicant whose proposal has been assessed, 15 copies of the Planning Director's assessment and determination, and any additional information regarding the areas of critical concern as delineated by the Director.
- (6) In the case of the applicant whose proposal has not been assessed, 15 copies of an EIS or an equivalent impact document as outlined in Rule 9.7.A(1-7), Rules and Regulations Relating to Environmental Shoreline Protection.
- (7) Any other plans or information required by the Planning Director.

FOR OFFICIAL USE:

Date Received _____

21st day _____

Public Hearing _____

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21st day _____
Public Hearing _____

SPECIAL MANAGEMENT AREA USE PERMIT APPLICATION

COUNTY OF HAWAII

PLANNING DEPARTMENT - PLANNING COMMISSION

APPLICANT: KUUIPO RESORT CONDOMINIUMS, INC.

APPLICANT'S SIGNATURE: *Kuuiipo Resort Condominiums, Inc.*
Sam I. Ishigo

APPLICANT'S INTEREST, IF NOT THE OWNER: PURCHASER

C/O Sam I. Ishigo
ADDRESS: P. O. Box 8, Honomu, HI. 96728

TELEPHONE: 963-6128

(business)

963-6128

(home)

OWNER: New World Investment

OWNER'S SIGNATURE: *Sam I. Ishigo*

TAX MAP KEY: 2-6-12-1,2,3

NATURE OF DEVELOPMENT: condominium and restaurant

APPLICANT'S REASON(S) FOR REQUESTING THE USE PERMIT: (Please attach)

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By Sam I. Ishigo

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PLANNING DEPARTMENT
County of Hawaii

APPLICATION FOR PLANNED DEVELOPMENT PERMIT

Name of Applicant: KUUIPO RESORT CONDOMINIUMS, INC.
(Print or Type)

(I) (We) hereby request approval of a planned development permit to allow the submission of plans for a hotel and/or condominium development for Plan Approval under the provisions of Chapter 8 (Zoning Code), Article 27, Section H of the Hawaii County Code, as amended, for the following described purpose:

Submissions:

1. Sixteen (16) copies of:
 - a. Application form
 - b. Description of the property in sufficient detail
 - c. Plot plan of the property, drawn to scale, with all proposed structures shown thereon
 - d. Any other plans or information
2. Twenty-five (25) copies of the Environmental Impact Statement (EIS)

Petitioner's interest in subject property: (Owner or lessee. If lessee, submit approval of intent by owner)

~~owner~~ Purchaser

Petitioner's reason (s) for requesting a Planned Development Permit:

- NOTE: (1) Explain how the proposed development would be consistent with the goals, policies, and course of action of the General Plan document. (Copies of the General Plan document are available at all public libraries and at the Hawaii County Planning Department).
- (2) State any other reason (s) for your request.
(please use separate sheet, if necessary)

The application shall be accompanied with a \$100.00 filing and processing fee.

NAME KUUIPO RESORT CONDOMINIUMS, INC.
(Print or Type)

TITLE President

SIGNATURE [Signature]
c/o Sam I. Ishizo

ADDRESS F. O. Box 2, Hanalei, HI. 96728

TELEPHONE 963-6128

DATE 18 April 1979

PLANNING DEPARTMENT
County of Hawaii

APPLICATION FOR PLANNED DEVELOPMENT PERMIT

Name of Applicant: KUUIPO RESORT CONDOMINIUMS, INC.
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(Print or Type)

TITLE President

SIGNATURE [Signature]
c/o Sam I. Ishigo

ADDRESS P. O. Box 2, Hanalei, HI. 96728

TELEPHONE 963-6128

DATE 18 April 1979

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