

\\6143-01\struct\6143s10.dwg, 10/17/2001 02:08:18 PM

ORIGINAL PLAN	DRAWN BY	DATE
		DESIGNED BY
		QUANTITIES BY
		CHECKED BY
NO.		

6143S10.DWG 08-21 04/03/00 m\dwg\6143-01\struct

### GENERAL

- MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS AND BUILDING CODE.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION AND MEANS/METHODS, TECHNIQUES, SEQUENCES, PROCEDURE, WORKMANSHIP AND JOB SAFETY INCLUDING FALSEWORK, BRACING, MUDSILLS AND OTHER TEMPORARY ITEMS USED FOR CONSTRUCTION OF PROJECT.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES. CONTRACTOR IS RESPONSIBLE FOR VERIFYING DIMENSIONS AND CONDITIONS AND REPORTING ANY DISCREPANCIES IN WRITING TO THE ARCHITECT BEFORE COMMENCING WORK OR ORDERING MATERIALS.
- SPECIAL NOTE: STRUCTURAL DESIGN DRAWINGS INCLUDES ARCHITECTURAL DRAWINGS WHICH ARE NECESSARY TO DEFINE DETAIL CONFIGURATION SUCH AS BUT NOT LIMITED TO, LOCATION OF MEMBERS, LOCATION OF OPENINGS, DIMENSIONS, ELEVATIONS, SLOPES, DEPRESSIONS, ETC.
- DESIGN CRITERIA
  - CODE: UBC 1994
  - DESIGN LIVE LOAD
    - ROOFS = 20 PSF
    - OFFICE = 50 PSF+20 PSF PARTITIONS
    - CORRIDORS = 100 PSF
    - STORAGE/MECH. = 250 PSF
    - MAINTENANCE SHOP
      - TRUCK: DUALWHEELS ON SINGLE AXLE PER AASHTO. = 32K
      - VEHICLE LIFT: POST = 10K
  - WIND = 80 MPH; EXPOSURE B, IMPORTANCE FACTOR=1.0
  - SEISMIC = ZONE 2B IMPORTANCE FACTOR=1.0
- SPECIAL INSPECTION

SPECIAL INSPECTION PER UBC 1701 IS REQUIRED FOR THE FOLLOWING TYPES OF CONSTRUCTION:

  - SPECIAL GRADING, EXCAVATIONS AND FILLING.
  - CONCRETE (OTHER THAN SLAB ON GRADE)
  - REINFORCEMENT STEEL PLACEMENT.
  - ANCHOR BOLT INSTALLATION.
  - HIGH STRENGTH BOLTING.

### FOUNDATION

- FOUNDATION DESIGN IS ENTIRELY BASED ON GEOTECHNICAL INVESTIGATION BY GEO-LABS HAWAII, DATED JANUARY 20, 1999 (W.O. 4100-00). THE CONTRACTOR SHALL REVIEW THE ABOVE SOILS REPORT AND COMPLY WITH ALL OF ITS REQUIREMENTS UNLESS NOTED OTHERWISE ON THE DRAWING.
- SOIL DESIGN VALUES:
  - SOIL BEARING 3000 PSF (X1.33 FOR WIND/SEISMIC)
  - ACTIVE PRESSURES 40 PCF
  - AT REST PRESSURES 55 PCF
  - PASSIVE PRESSURES 300 PCF
  - COEFFICIENT OF FRICTION 0.4
- CONTRACTOR SHALL PROVIDE FOR DEWATERING OF EXCAVATIONS FROM EITHER SURFACE WATER, GROUND WATER, OR SEEPAGE.
- FOUNDATION EXCAVATIONS SHALL BE APPROVED BY THE SOILS ENGINEER PRIOR TO PLACING THE CONCRETE AND REINFORCING. CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN EXCAVATION IS READY FOR INSPECTION.

### CAST-IN-PLACE CONCRETE

- MATERIALS AND WORKMANSHIP TO CONFORM TO THE LATEST EDITION OF THE BUILDING CODE. REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318) WITH MODIFICATIONS AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
- 28-DAYS MINIMUM STRENGTH OF ALL STRUCTURAL CONCRETE SHALL BE 3000 PSI.
- CONCRETE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
  - CONCRETE CAST AGAINST EARTH . . . . . 3"
  - FORMED SURFACES EXPOSED TO EARTH/WEATHER
    - #5 BAR & SMALLER. . . . . 1-1/2"
    - #6 BAR & LARGER. . . . . 2"
  - NOT EXPOSED TO EARTH/WEATHER. . . . . 3/4"
  - SLAB ON GRADE. . . . . 1"
- CONCRETE ADMIXTURES CONTAINING CHLORIDE OR CHLORIDE SALTS SHALL NOT BE USED.

### REINFORCING STEEL

- REINFORCING STEEL BARS SHALL CONFORM TO ASTM A-615 GRADE 60 REQUIREMENTS.
- BAR BENDS, HOOKS AND OFFSETS TO BE IN ACCORDANCE WITH ACI RECOMMENDATIONS.
- REINFORCING BAR BENDS SHALL BE MADE COLD.
- REINFORCING BARS MARKED CONTINUOUS (CONT) SHALL BE AS LONG AS PRACTICABLE AND SHALL BE LAPPED AT SPLICES AND CORNERS NOT LESS THAN 48 BAR DIAMETERS (24" MIN) UNLESS OTHERWISE NOTED. STAGGER HORIZONTAL BAR SPLICES.
- DOWELS BETWEEN FOOTING AND WALL OR COLUMN SHALL BE THE SAME SIZE AND SPACING OR NUMBER AS THE VERTICAL REINFORCING RESPECTIVELY, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL SUBMIT REINFORCING BAR LAYOUTS AND DETAILS FOR ARCHITECTS REVIEW PRIOR TO FABRICATION. FABRICATE FROM REVIEWED DRAWINGS ONLY.

### CONCRETE MASONRY (CMU)

- CONCRETE BLOCK SHALL BE HOLLOW LOAD-BEARING CONCRETE MASONRY UNITS CONFORMING TO A.S.T.M. C-90 GRADE N-II UNITS, NORMAL WEIGHT.
- MORTAR SHALL BE TYPE M OR S WITH A MINIMUM COMPRESSIVE STRENGTH OF 1800 PSI AT 28 DAYS.
- GROUT SHALL CONFORM TO REQUIREMENTS OF SECTION 2103 OF UBC FOR COARSE GROUT. USE SUFFICIENT WATER FOR GROUT TO FLOW INTO ALL JOINTS OF THE MASONRY WITHOUT SEGREGATION. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS = 2000 PSI.
- USE LOW LIFT CONSTRUCTION WITH A MAXIMUM GROUT POUR HEIGHT OF 5 FEET.
- GROUT SOLID ALL CELLS.
- UNLESS OTHERWISE NOTED, WALLS SHALL BE CONSTRUCTED IN CONVENTIONAL RUNNING BOND.
- PROVIDE A MINIMUM OF 1/2" GROUT BETWEEN REINFORCING STEEL AND MASONRY UNITS.
- CMU WALL REINFORCING SHALL BE #4 @ 24" E.W., SINGLE MAT AT CENTER OF WALL UNLESS NOTED OTHERWISE. PROVIDE HORIZONTAL JOINT REINFORCING AT 16" O.C.

### STRUCTURAL STEEL

- THE FOLLOWING NOTES SHALL APPLY TO ALL STRUCTURAL STEEL EXCEPT AS MODIFIED BY "PRE-ENGINEERED BUILDING" NOTES.
- STRUCTURAL STEEL SHALL BE ASTM A36.
- PIPE COLUMNS SHALL CONFORM TO ASTM A53, GRADE B. STEEL TUBES SHALL COMFORM TO ASTM A 500, GRADE B.
- MACHINE BOLTS (M.B.) AND ANCHOR BOLTS (AB) SHALL BE ASTM A307 GRADE A.
- WORKMANSHIP (DETAILING, FABRICATION, AND ERECTION) TO BE IN ACCORDANCE WITH THE LATEST AISC AND AWS CODES.
- WELDING TO BE DONE BY CERTIFIED WELDERS ONLY.
- STRUCTURAL STEEL AND MISCELLANEOUS METAL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
- STRUCTURAL STEEL SURFACES THAT ARE ENCASED IN CONCRETE OR MASONRY SHALL BE LEFT UNPAINTED.
- GROUT (OR DRY PACK) BELOW BASE PLATES, BEAMS BEARING ON MASONRY WALLS, ETC., SHALL BE NON-SHRINK WITH F'c = 4000 PSI. MINIMUM.
- STRUCTURAL STEEL FABRICATOR SHALL FURNISH SHOP DRAWINGS OF STEEL FOR ENGINEERS REVIEW BEFORE FABRICATION.

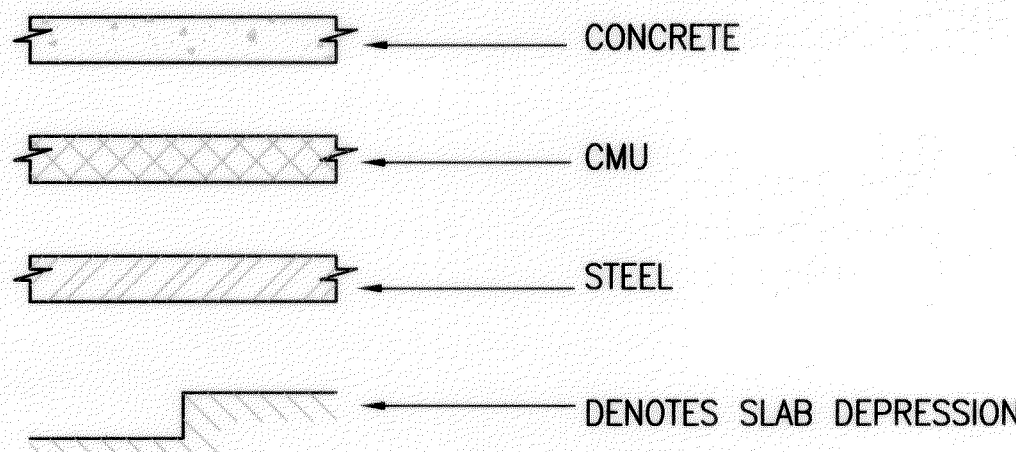
### PRE-ENGINEERED BUILDING

- BUILDING MANUFACTURER SHALL BE CERTIFIED BY AISC, MB CATEGORY AND SHALL BEAR FULL AND UNDIVIDED RESPONSIBILITY FOR PRE-ENGINEERED BUILDING AND ITS COMPONENT PARTS.
- STRUCTURAL APPLICABLE CODE: DESIGN METAL SYSTEM FOR WIND AND SEISMIC LOADS AS PRE-SCRIBED IN NOTE 5. DESIGN CRITERIA, GENERAL. STEEL CONSTRUCTION SHALL CONFORM TO SPECIFICATIONS AND STANDARDS PRESENTED IN THE 9TH EDITION OF AISC STEEL CONSTRUCTION MANUAL. UNLESS OTHERWISE NOTED, STEEL SHALL CONFORM TO ASTM A50.
- WELDING: WELDING SHALL CONFORM TO AWS CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. WELDERS SHALL BE CERTIFIED. UNLESS OTHERWISE NOTED, ELECTRODES SHALL CONFORM TO E 70XX.
- BOLTS: ANCHOR BOLTS (A.B.) SHALL BE ASTM A307, GRADE A, OTHER BOLTS UNLESS OTHERWISE NOTED SHALL CONFORM TO ASTM A325.

## STRUCTURAL NOTES

- CONTRACTOR TO SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS FOR RIGID AND PORTAL FRAMES TO ENGINEER FOR APPROVAL.
- DESIGN OF RIGID AND PORTAL FRAMES SHALL BE BASED ON CRITERIA TO LIMIT DEFLECTION TO H/120 FOR WIND LOADINGS AND H/240 FOR SEISMIC LOADINGS, WHERE H = HEIGHT AT EAVE. DESIGN SHALL ALSO INCLUDE CRANE LOADS SEE S8.1.
- RIGID AND PORTAL FRAME DRAWINGS AND CALCULATIONS SHALL BEAR STAMP OF A STRUCTURAL ENGINEER LICENSED IN THE STATE OF HAWAII.
- CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE LOADS ACTING ON RIGID AND PORTAL FRAME. DESIGN SHALL CONFORM TO APPLICABLE REQUIREMENTS OF LOCAL BUILDING CODE, AND SHALL ALLOW A MINIMUM OF 5 PSF ROOF SUPERIMPOSED DEAD LOAD. ADDITIONAL ROOF COLLATERAL LOADS TO BE SHOWN ON PLANS.
- CONTRACTOR TO PROVIDE FOR LATERAL STABILITY OF RIGID FRAME STRUCTURE UNDER ALL CONDITIONS, INCLUDING ERECTION.
- ARCHITECTURAL DRAWINGS SHALL BE REFERRED TO FOR FURTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.
- DESIGN SHALL INCLUDE FOLLOWING:
  - RIGID FRAME WITH PURLINS AND CROSS BRACINGS.
  - ROOF ROD BRACING, WIND POST, PORTAL FRAMES.
  - BASE PLATE AND ANCHOR BOLTS.
  - OVERHANGS AT SIDES OF BUILDING.
  - ANALYSIS AND DESIGN FOR LOADS IMPOSED BY MOVABLE CRANE AND ASSOCIATED DEFLECTION CRITERIA.
  - CONNECTIONS.
- FOUNDATION AND ANCHOR BOLTS FOR PRE-ENGINEERED ELEMENTS SHALL NOT BE PLACED UNTIL SHOP DRAWINGS HAVE BEEN SUBMITTED, REVIEWED, AND APPROVED.
- SEE SPECIFICATIONS AND DRAWINGS FOR REQUIREMENTS TO OPERATIONS OF CRANE.
- COLUMNS IN RIGID AND PORTAL FRAME SHALL BE DESIGNED AS PINNED AT BASE.
- SCOPE OF WORK:
  - OFFICE BUILDING: ENTIRE BUILDING
  - MAINTENANCE BUILDING: ENTIRE BUILDING
  - STORAGE/STORAGE SHED: PARTIAL-ROOF AND WALLS ONLY.
  - EQUIPMENT SHED: PARTIAL-ROOF ONLY.

### LEGEND



### STRUCTURAL DRAWING ORGANIZATION

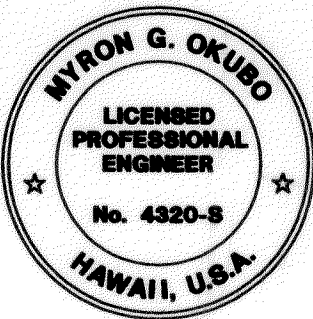
CATEGORY DESCRIPTION: GENERAL NOTES AND TYPICAL DETAILS  
OFFICE BUILDING  
MAINTENANCE BUILDING  
STORAGE/STORAGE SHED  
EQUIPMENT SHED  
FOUNDATION DETAILS  
ROOF DETAILS  
CRANE RAIL DETAILS

SECTION:  
1 SERIES SHEET(S)  
2 SERIES SHEET  
3 SERIES SHEET  
4 SERIES SHEET  
5 SERIES SHEET  
6 SERIES SHEET(S)  
7 SERIES SHEET  
8 SERIES SHEET

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-M-05-98	2002	62	99

### STRUCTURAL ABBREVIATIONS

AB	ANCHOR BOLT	LLH	LONG LEG HORIZONTAL
ALT	ALTERNATE	LLV	LONG LEG VERTICAL
APPROX	APPROXIMATE	LONGIT	LONGITUDINAL
ARCH	ARCHITECTURAL	MAX	MAXIMUM
(B)	BOTTOM (REINFORCEMENT)	MB	MACHINE BOLT
BLDG	BUILDING	MECH	MECHANICAL
BM	BEAM	MFR	MANUFACTURER
BOT	BOTTOM	MIN	MINIMUM
BTWN	BETWEEN	MISC	MISCELLANEOUS
CIP	CAST-IN-PLACE	NIC	NOT IN CONTRACT
CCJ	CRACK CONTROL JOINT	NTS	NOT TO SCALE
CJ	CONSTRUCTION JOINT	Ø	DIAMETER
CL	CENTERLINE	OC	ON CENTER
CLR	CLEAR(ANCE)	OD	OUTSIDE DIAMETER
CMU	CONCRETE MASONRY UNIT	OH	OPPOSITE HAND
COL	COLUMN	OPNG	OPENING
CONC	CONCRETE	OPP	OPPOSITE
CONN	CONNECTION	PART	PARTIAL
CP	COMPLETE PENETRATION	PL	PLATE
CONSTR	CONSTRUCTION	PP	PARTIAL PENETRATION
CONT	CONTINUOUS	PT	POINT
DBL	DOUBLE	RO	ROUGH OPENING
DET	DETAIL	RAD	RADIUS
DIA	DIAMETER	REINF	REINFORCED, REINFORCEMENT
DIM	DIMENSION	REQ'D	REQUIRED
DWG	DRAWING	SCHED	SCHEDULE
EA	EACH	SECT	SECTION
EF	EACH FACE	SHT	SHEET
EJ	EXPANSION JOINT	SIM	SIMILAR
ELEV	ELEVATOR	SL	SLOPE
EQ	EQUAL	SOG	SLAB - ON - GRADE
ES	EACH SIDE	SPECS	SPECIFICATIONS
EW	EACH WAY	SQ	SQUARE
EXT	EXTERIOR	STD	STANDARD
EXIST	EXISTING	STIFF	STIFFENER
FDN	FOUNDATION	STRUCT	STRUCTURAL
FL	FLOOR	SYMM	SYMMETRICAL
FOC	FACE OF CONCRETE	(T)	TOP (REINFORCEMENT)
FIN	FINISH	T&B	TOP AND BOTTOM
FTG	FOOTING	THK	THICK
GA	GAUGE	THRU	THROUGH
GALV	GALVANIZED	TRANSV	TRANSVERSE
(H)	HORIZONTAL (REINFORCEMENT)	TYP	TYPICAL
HORIZ	HORIZONTAL	UNO	UNLESS NOTED OTHERWISE
HP	HIGH POINT	(V)	VERTICAL REINFORCEMENT
INFO	INFORMATION	VERT	VERTICAL
INT	INTERIOR	W/	WITH
JT	JOINT		



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

*Myron Okubo*

### TYPICAL INFORMATION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### STRUCTURAL NOTES AND ABBREVIATIONS

MOLOKAI BASEYARD  
MOLOKAI INDUSTRIAL PARK  
Project No. HWY-M-05-98

Scale: As Noted Date: SEPT. 13, 2001

SHEET No. S1.1 OF S1.2 SHEETS