

GENERAL

- MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS, SPECIFICATIONS, AND THE 2003 INTERNATIONAL BUILDING CODE AS AMENDED BY THE CITY AND COUNTY OF HONOLULU.
- DURING THE CONSTRUCTION PERIOD BE RESPONSIBLE FOR THE SAFETY OF THE STRUCTURES. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES. DEVIATIONS MUST BE APPROVED BY GOVERNING AGENCY PRIOR TO ERECTION.
- ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. DEVIATION MUST BE APPROVED BY OSHA PRIOR TO ERECTION.
- BE SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING, AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS, AND UTILITIES IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL SAFETY ORDINANCES.
- BE RESPONSIBLE FOR COORDINATING WORK OF TRADES AND SHALL CHECK DIMENSIONS. DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE CONTRACTING OFFICER AND BE RESOLVED BEFORE PROCEEDING WITH THE WORK.
- SHOP DRAWINGS REQUIRED BY SPECIFICATIONS SHALL BE SUBMITTED TO THE CONTRACTING OFFICER FOR REVIEW PRIOR TO FABRICATION.
- DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED SUBJECT TO REVIEW BY THE CONTRACTING OFFICER.
- DETAILS DESIGNATED AS STANDARD OR TYPICAL SHALL OCCUR IN ADDITION TO OTHER SPECIFIC DETAIL CALLED OUT.
- CONNECTIONS AND CONSTRUCTION CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE DETAILED BY THE CONTRACTOR AND SHALL BE SUBMITTED TO THE CONTRACTING OFFICER FOR REVIEW. DETAILS SHALL COMPLY WITH DRAWINGS AND SPECIFICATIONS, CONFORM TO CURRENT CONSTRUCTION PRACTICES, AND MEET REQUIREMENTS OF THE LATEST APPLICABLE BUILDING CODES.
- SEE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR SIZE AND LOCATION OF OPENINGS REQUIRED FOR DUCTS, PIPES AND PIPE SLEEVES, ELECTRICAL CONDUITS, AND OTHER ITEMS TO BE EMBEDDED IN CONCRETE OR OTHERWISE INCORPORATED IN STRUCTURAL WORK.
- PROVIDE OPENINGS AND SUPPORTS AS REQUIRED FOR MECHANICAL EQUIPMENT, EVENTS, DUCTS, PIPING, ETC. SUSPENDED MECHANICAL EQUIPMENT SHALL BE SWAY OR LATERALLY BRACED.
- ARCHITECTURAL AND MECHANICAL PLANS ARE CONSIDERED A PART OF THE STRUCTURAL DESIGN DRAWINGS AND ARE TO BE USED TO DEFINE DETAIL CONFIGURATIONS INCLUDING, BUT NOT LIMITED TO RELATIVE LOCATION OF MEMBERS, ELEVATIONS, LOCATION OF OPENINGS, ETC.
- MECHANICAL EQUIPMENT SHALL BE FIRMLY ATTACHED TO STRUCTURE. ISOLATORS, FASTENERS AND OTHER ELEMENTS PROVIDING STABILITY FOR MECHANICAL EQUIPMENT SHALL BE CAPABLE OF TRANSMITTING REQUIRED CODE LOADS.

FOUNDATIONS

- FOUNDATION DESIGN IS BASED ON THE RECOMMENDATION PROVIDED BY GEOLABS, INC. IN A GEOTECHNICAL REPORT ENTITLED: GEOTECHNICAL ENGINEERING EXPLORATION D.A.G.S. ANUENUE RADIO SITES AND TOWERS - HALAI HILL, HILO, ISLAND OF HAWAII, DATED APRIL 1, 2010. THE REPORT IS PART OF THE PLANS AND SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
- FOUNDATION EXCAVATIONS SHALL BE EXAMINED BY A CURRENTLY U.S. LICENSED PROFESSIONAL GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL OR CONCRETE.
- COMPACTION: MATERIAL FOR FILLING AND BACKFILLING SHALL BE IN CONFORMANCE TO THE ABOVE NOTED SOILS REPORT AND SHALL BE FREE OF ORGANIC MATTER, TRASH, LUMBER OR OTHER DEBRIS.
- ALLOWABLE BEARING PRESSURE: 3000 PSF
COEFFICIENT OF FRICTION: 0.35
PASSIVE EARTH PRESSURE: 350 PSF
- A PROBING AND GROUTING PROGRAM SHOULD BE IMPLEMENTED. SEE GEOTECHNICAL REPORT FOR REQUIREMENTS.

REINFORCING STEEL

- REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60 UNLESS OTHERWISE NOTED.
- REINFORCING STEEL SHALL BE LAPPED 48 DIAMETERS OR TWO FEET MINIMUM UNLESS OTHERWISE NOTED. ALL SPLICES SHALL BE WELL STAGGERED.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- ANCHOR BOLTS, DOWELS AND OTHER EMBEDDED ITEMS SHALL BE SECURELY TIED IN PLACE BEFORE CONCRETE IS POURED.

FIBER REINFORCEMENT

- REINFORCING FIBERS: ASTM C116, TYPE III, HIGH STRENGTH INDUSTRIAL-GRADE FIBERS, FIBRILLATED OR MONOFILAMENT POLYPROPYLENE FIBERS, ENGINEERED AND DESIGNED FOR SECONDARY REINFORCEMENT OF CONCRETE. SHALL OBTAIN MINIMUM AVERAGE RESIDUAL STRENGTH OF 263 PSI IN ACCORDANCE WITH ASTM C1399.
- UNIFORMLY DISPERSE PRODUCT IN CONCRETE MIX PER MANUFACTURER'S RECOMMENDED RATE OF APPROXIMATELY 7.5 LBS REINFORCING FIBERS PER CUBIC YARD OF CONCRETE TO ACHIEVE REDUCTION IN PLASTIC AND HARDENED CONCRETE SHRINKAGE AS WELL AS IMPROVE IMPACT STRENGTH AND CONCRETE TOUGHNESS. PRODUCT MANUFACTURER SHALL WORK WITH READY MIX PRODUCER ON MIX DESIGN TO MEET ENGINEERING REQUIREMENTS.

CONCRETE

- CONCRETE UNLESS NOTED OTHERWISE SHALL BE REGULAR WEIGHT HARD ROCK TYPE (150 PCF). SILICEOUS AGGREGATES (NATURAL SAND AND ROCK) SHALL CONFORM TO CHAPTER 17 OF THE 2003 INTERNATIONAL BUILDING CODE AND ASTM C33 WITH PROVEN SHRINKAGE CHARACTERISTICS OF LESS THAN 0.05%.
- MINIMUM ULTIMATE COMPRESSIVE STRENGTHS (AT 28 DAYS) SHALL BE:
EXTERIOR SLAB ON GRADE: 4000 PSI FOOTINGS: 4000 PSI
INTERIOR SLAB ON GRADE: 4000 PSI OTHER: 4000 PSI
BEAMS, COLUMNS, WALLS: 4000 PSI
SUSPENDED SLABS: 4000 PSI
- CEMENT SHALL CONFORM TO ASTM C150, TYPE I OR II.
- MAXIMUM SLUMP SHALL NOT EXCEED 4 INCHES IN FLATWORK.
- PLACEMENT OF CONCRETE SHALL BE IN CONFORMANCE WITH ACI 301.
- CONCRETE SHALL BE MAINTAINED IN A MOIST CONDITION FOR A MINIMUM OF FIVE(5) DAYS AFTER PLACEMENT. ALTERNATE METHODS WILL BE APPROVED IF SATISFACTORY PERFORMANCE CAN BE ASSURED AND IS APPROVED BY THE CONTRACTING OFFICER.
- KEYED CONSTRUCTION JOINTS SHALL BE USED. CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND LAITANCE SHALL BE REMOVED. VERTICAL JOINTS SHALL BE THOROUGHLY WETTED AND SLUSHED WITH A COAT OF NEAT CEMENT IMMEDIATELY BEFORE PLACING NEW CONCRETE.
- SUBMIT LOCATION OF POUR JOINTS PRIOR TO PLACEMENT. POUR JOINTS SHALL BE LOCATED TO MINIMIZE EFFECTS OF SHRINKAGE AS WELL AS PLACED AT POINTS OF LOW STRESS.
- UNLESS NOTED OTHERWISE, MINIMUM CONCRETE COVERAGE OF REINFORCING STEEL SHALL BE AS FOLLOWS:
CAST AGAINST GROUND 3"
FORMED, IN CONTACT WITH GROUND 2"
INTERIOR WALLS 1"
EXTERIOR WALLS, EXPOSED TO WEATHER 1-1/2"
EXTERIOR WALLS, NOT EXPOSED TO WEATHER 1"
SUSPENDED SLABS 1"
BEAMS, COLUMNS 1-1/2"
- PIPES OTHER THAN ELECTRICAL CONDUIT SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE EXCEPT WHERE SPECIFICALLY APPROVED.

MOISTURE BARRIER

- MOISTURE BARRIER MEMBRANE SHALL HAVE THE FOLLOWING PROPERTIES:
A. MINIMUM 15 MIL THICK POLYOLEFIN GEOMEMBRANE.
B. MANUFACTURED FROM ISO CERTIFIED VIRGIN RESINS.
C. WATER VAPOR BARRIER: ASTM E1745, MEETS OR EXCEEDS CLASS B.
D. WATER VAPOR TRANSMISSION RATE: ASTM E96, 0.0006 GR/SQ FT/HR OR LOWER.
E. PERMEANCE RATING: ASTM E96, 0.01 GR/SQ TF/HR OR LOWER.
F. PUNCTURE RESISTANCE: ASIM E 1745, MINIMUM 1970 GRAMS.
G. TENSILE STRENGTH: AASTM E1745, MINIMUM 45.0 LB/IN.
H. ACCEPTABLE MANUFACTURE INCLUDE: STEGO INDUSTRIES LLC, "STEGO WRAP."
- ACCESSORIES:
A. SEAM TAPE: HIGH DENSITY POLYETHYLEN TAPE WITH PRESSURE SENSITIVE ADHESIVE, MINIMUM 4 INCHES WIDE, AS RECOMMENDED BY MANUFACTURER.
B. PIPE BOOTS: CONSTRUCT PIPE BOOTS FROM VAPOR BARRIER MATERIAL AND PRESSURE SENSITIVE TAPE, IN ACCORDANCE WITH SLIP SHEET MANUFACTURER'S INSTRUCTIONS.

CONCRETE MASONRY (CMU)

- CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, TYPE II.
- MORTAR SHALL CONFORM TO ASTM C270, TYPE M.
- GROUT SHALL CONFORM TO ASTM C476. GROUT ALL CELLS SOLID UNLESS OTHERWISE NOTED.
- THE THICKNESS OF THE GROUT BETWEEN BLOCK UNITS AND REINFORCING STEEL SHALL BE NOT LESS THAN 1/2", BETWEEN PARALLEL REINFORCING BARS, NOT LESS THAN 3/4".
- IF WORK IS STOPPED ONE (1) HOUR OR LONGER, PROVIDE HORIZONTAL CONSTRUCTION JOINTS BY STOPPING THE GROUT 1-1/2" BELOW THE TOP OF THE BLOCK.
- SEE REINFORCING STEEL NOTES AND STANDARD DETAILS FOR REINFORCEMENT REQUIREMENTS. REINFORCING STEEL IN MASONRY SHALL BE LAPPED A MINIMUM OF 48 BAR DIAMETERS.
- SPECIAL INSPECTION BY AN INSPECTOR APPROVED BY THE CONTRACTING OFFICER AND THE BUILDING DEPARTMENT SHALL BE REQUIRED AS NOTED IN THE SPECIAL INSPECTION NOTES.
- GROUT SHALL CONFORM TO ASTM C476 WITH A MINIMUM STRENGTH OF 2500 PSI.

DESIGN LOADS

- WIND LOAD:
BASIC WIND SPEED (HURRICANE 4) 155 MPH
IMPORTANCE FACTOR (iw) 1.15
WIND EXPOSURE FACTOR C
- SEISMIC LOAD:
OCCUPANCY CATEGORY IV
SITE CLASSIFICATION SITE CLASS D
Ss 0.2 SECOND SPECIAL ACCELERATION 1.50g
S1 1.0 SECOND SPECTRAL ACCELERATION 0.60g
IMPORTANCE FACTOR (IE) 1.50
- LIVE LOADS: PER TABLE 1607.1 (IBC)
A. ROOF AS PER SECTION 1607.11 (IBC)
EQUIPMENT 125 PSF

SPECIAL INSPECTION (IBC CHAPTER 17)

- SPECIAL INSPECTION SHALL BE PERFORMED PER REQUIREMENTS OF CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE (2003 EDITION) AS AMENDED BY THE CITY & COUNTY OF HONOLULU.

SPECIAL INSPECTION SCHEDULE ESTABLISHED PER 2003 IBC SECTION 109 & CHAPTER 17			
ITEM	CONTINUOUS INSPECTION	PERIODIC INSPECTION	COMMENTS
CONCRETE			
REINFORCING PLACEMENT		X	
PREPARATION OF TEST SPECIMENTS	X		
CONCRETE PLACEMENT	X		
BOLTS INSTALLED IN CONCRETE	X		
USE OF REQUIRED DESIGN MIX		X	
STEEL CONSTRUCTION			
HIGH-STRENGTH BOLTING		X	
BEARING-TYPE CONNECTIONS		X	
SLIP-CRITICAL CONNECTIONS	X	X	
STRUCTURAL MASONRY			
SITE PREPARED MORTAR		X	
MORTAR JOINTS		X	
REINFORCEMENT PLACEMENT		X	

- THE SPECIAL INSPECTOR SHALL SUBMIT A SIGNED FINAL REPORT TO THE BUILDING DEPARTMENT AND CONTRACTING OFFICER.
- STATE WILL ENGAGE THE SERVICES OF AN INDEPENDENT STRUCTURAL ENGINEER TO PROVIDE INSPECTIONS INCLUDING SPECIAL INSPECTIONS IN ACCORDANCE WITH SECTION 1709 OF THE IBC. OBSERVED DEFICIENCIES SHALL BE REPORTED IN WRITING.
- ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO SAMPLE MATERIALS, PERFORM TESTS, AND SUBMIT TEST REPORTS TO STATE.

ADD 1	NOTE REVISED	2/5	4/30/10
REVISION NO.	SYN.	DESCRIPTION	DATE
		DEPT. OF ACCOUNTING & GENERAL SERVICES DIVISION OF PUBLIC WORKS STATE OF HAWAII INFORMATION AND COMMUNICATION SERVICES DIVISION HILO MAUKA RADIO SITE AND TOWER HILO, HAWAII 96720 T.M.K. 2-3-022:037	
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION 		DATED JOB NO. 11-10-0479	DRAWING NO. S-1
DESIGNED BY: SK	CHECKED BY: SK	DATE APR 5 2010	SHEET 18
DRAWN BY: CM/GH	APPROVED BY: SK	SCALE: AS NOTED	OF 63 SHEETS