

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY -H-02-88	1987	68	115

ABBREVIATIONS

AC	ASPHALT CONCRETE
ALT	ALTERNATE
BC	BASE COURSE
BVC	BEGIN VERTICAL CURVE
C	CHORD DISTANCE
CMP	CORRUGATED METAL PIPE
CLR	CLEAR
COMM	COMMUNICATION
CONC	CONCRETE
CONT	CONTINUOUS
COORD	COORDINATE
CRM	CEMENT RUBBLE MASONRY
CU YD, CY	CUBIC YARD
DI	DROP INLET
DOT	DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION
E	EAST
EF	EACH FACE
ELEC	ELECTRICAL
ELEV	ELEVATION
EVC	END VERTICAL CURVE
EW	EACH WAY
FTG	FOOTING
GALV	GALVANIZED
GRP	GROUTED RUBBLE PAVING
H, HORIZ	HORIZONTAL
INV	INVERT
LC	LENGTH OF CURVE
LT	LEFT
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH
NARS	MAUNA KEA ICE AGE NATURAL AREA RESERVE
OC	ON CENTER
OD	OUTSIDE DIAMETER
O/S	OFFSET
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
PCC	POINT OF COMPOUND CURVATURE
PIVC	POINT OF INTERSECTION OF VERTICAL CURVE TANGENTS
POC	POINT ON HORIZONTAL CURVE
POVC	POINT ON VERTICAL CURVE
PRVC	POINT OF REVERSE VERTICAL CURVE
PT	POINT OF TANGENCY
PAVT	PAVEMENT
R	RADIUS OF CURVE
RET	RETAINING
RT	RIGHT
R/W	RIGHT-OF-WAY
S	SOUTH
SQ FT, SF	SQUARE FEET
STA	STATION
STD	STANDARD
T	TANGENT DISTANCE
TF	TOP FOOTING ELEVATION
TW	TOP WALL ELEVATION
TYP	TYPICAL
USGS	UNITED STATES GEOLOGICAL SURVEY
V, VERT	VERTICAL
W	WEST
WHT	WHITE

LEGEND

	EDGE EXISTING ROAD
	NEW R/W
	EXISTING CONTOUR
	EXISTING CONTOUR
	FINISH CONTOUR
	FINISH SPOT ELEVATION
	DIRECTION OF FLOW
	EXISTING LIVE UNDERGROUND POWER/ COMMUNICATION LINES TO REMAIN
	EXISTING ABANDONED UNDERGROUND POWER/ COMMUNICATION LINES TO BE REMOVED
	NEW GUARD RAIL
	NEW RETAINING WALL
	SOIL BORING
	SOIL TEST PIT
	TRAVERSE CONTROL POINT AND BENCH MARK (1/2" PIPE IN CONCRETE)
	EXISTING CONC JACKET ON LIVE UNDERGROUND POWER/COMMUNICATION LINES

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1985, (HEREINAFTER REFERRED TO AS THE STANDARD SPECIFICATIONS) AND THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, UNLESS OTHERWISE INDICATED.
- TOPOGRAPHIC CONTOURS, ELEVATIONS, AND FEATURES SHOWN ARE BASED ON TOPOGRAPHIC MAPS AND DATA PREPARED BY RM TOWILL CORPORATION IN 1985.
- ELEVATIONS ARE BASED ON USGS MEAN SEA LEVEL DATUM, REFERENCE ELEVATION MARKERS ESTABLISHED BY THE SURVEYOR ARE IDENTIFIED ON THE PLANS AND SHOWN ON THE SHEET LAYOUT INDEX PLAN.
- AZIMUTHS ARE ORIENTED FROM TRUE SOUTH.
- ACCESS THROUGH OR AROUND WORK AREAS SHALL BE MAINTAINED AT ALL TIMES (24 HOURS/DAY) TO ALLOW OBSERVATORY PERSONNEL AND WORKERS TO PASS SAFELY. CONTRACTOR SHALL SUBMIT CONSTRUCTION PHASING, DETOUR, AND TRAFFIC MAINTENANCE PLANS TO THE ENGINEER AND THE MANAGER OF THE MAUNA KEA OBSERVATORY SUPPORT SERVICES AT LEAST TEN (10) DAYS BEFORE STARTING CONSTRUCTION AND TO OBTAIN WRITTEN APPROVAL PRIOR TO PROCEEDING WITH THE CONSTRUCTION. PLANS SHALL COVER SPECIFIC PROBLEM AREAS OR CONDITIONS ANTICIPATED.
- TRAFFIC MAINTENANCE, DETOURS AND TEMPORARY CONSTRUCTION SIGNS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
- ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE PROTECTED AT ALL TIMES.
- ALL EXISTING PAVEMENTS, UTILITIES, AND OTHER FACILITIES OUTSIDE OF THE ROADWAY RIGHT-OF-WAY WHICH ARE DAMAGED BY THE CONTRACTOR SHALL BE RECONSTRUCTED OR REPLACED TO THE ORIGINAL UNDAMAGED CONDITION, AT THE CONTRACTOR'S EXPENSE, AS DIRECTED BY THE ENGINEER.
- THE CONTRACTOR SHALL MAINTAIN DUST CONTROL PROCEDURES IN CONFORMANCE TO AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
- THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS.
- CONSTRUCTION STAKE OUT SHALL BE DONE BY THE STATE.
- "LEFT" OR "RIGHT" AS SHOWN ON THE PLANS REFER TO THE SIDE OF THE ROAD, LOOKING UPSTATION.
- CONTRACTOR SHALL INSTALL CENTERLINE MONUMENTS AT EACH PC AND PT STATION INDICATED ON THE ALIGNMENT PLANS IN ACCORDANCE WITH STANDARD PLAN NO. D-06 AND SECTION 613 OF THE STANDARD SPECIFICATIONS.
- CONTRACTOR SHALL REMOVE ALL EXISTING IMPROVEMENTS WITHIN THE NEW ROADWAY SECTION INCLUDING REFLECTORS ON POSTS, SIGN POSTS, AC PAVEMENT, ETC., UNLESS OTHERWISE INDICATED.
- CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHILE WORKING ON OR NEAR EXISTING DUCTLINES. CONTRACTOR SHALL CONTACT HAWAII ELECTRIC LIGHT CO., INC. PRIOR TO THE START OF CONSTRUCTION TO COORDINATE PROTECTION OF ELECTRICAL DUCTS. CONTRACTOR SHALL FURNISH WRITTEN EVIDENCE TO THE ENGINEER THAT COORDINATION INFORMATION HAS BEEN PROVIDED. REFER ALSO TO STANDARD SPECIFICATIONS SECTION 107.21.
- RETAINING WALLS SHALL BE REINFORCED CONCRETE. WALL FOOTING ELEVATIONS SHOWN ON WALL PROFILES ARE TO TOP OF FOOTING.
- EXCAVATION AND EMBANKMENT QUANTITIES SHOWN ON THE CROSS SECTION SHEETS DO NOT INCLUDE EXCAVATION FOR PAVEMENT STRUCTURE.

SEE RIGHT FOR CONTINUATION

GRADING NOTES

- GRADING WORK SHALL CONFORM TO CHAPTER 10 OF COUNTY OF HAWAII CODE AND SHALL NOT COMMENCE UNTIL A GRADING PERMIT IS OBTAINED.
- ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, ON WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS, AND TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- PERMANENT FILL SHALL BE COMPACTED TO 95% RELATIVE COMPACTION BASED ON ASTM D1557-78 TEST.
- FILL SLOPES SHALL BE OVERBUILT AND TRIMMED BACK TO DESIGN GRADE TO EXPOSE FIRM COMPACTED MATERIAL.
- ESTIMATED EARTHWORK QUANTITIES FOR ROADWAY:  
  
EXCAVATION = 37,080 CU YD  
  
EMBANKMENT = 37,410 CU YD  
  
QUANTITIES INDICATED ARE FOR DESIGN AND GRADING PERMIT PURPOSES. QUANTITIES ARE "IN PLACE" WITHOUT SHRINKAGE OR SWELLING ALLOWANCE. CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN QUANTITIES USED FOR BIDDING PURPOSES.
- BORROW MATERIAL SHALL BE OBTAINED FROM THE STOCKPILE SITE IN PHASE I.
- A SOILS REPORT FOR THIS PROJECT HAS BEEN PREPARED BY DAMES & MOORE; CONTRACTOR SHOULD OBTAIN AND REVIEW THE SOILS REPORT TO DRAW HIS OWN CONCLUSIONS AND SUPPLEMENT THE GRADING ORDINANCE REQUIREMENTS.
- TEMPORARY SOIL EROSION CONTROL PROCEDURES SPECIFIC TO THE CONTRACTOR'S GRADING OPERATIONS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL TO THE COUNTY OF HAWAII PUBLIC WORKS DEPARTMENT, THE STATE DEPARTMENT OF TRANSPORTATION-HIGHWAYS DIVISION ENGINEER AND THE MAUNA KEA OBSERVATORY SUPPORT SERVICES MANAGER AT LEAST TEN (10) DAYS PRIOR TO A SCHEDULED EROSION CONTROL CONFERENCE. REFER ALSO TO STANDARD SPECIFICATIONS SECTION 639.
- NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE CHIEF ENGINEER, DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII, AND THE STATE DEPARTMENT OF TRANSPORTATION-HIGHWAYS DIVISION ENGINEER.
- 10-FEET FINISH CONTOURS ARE SHOWN CONNECTING TO THE EXISTING CONTOURS ON THE PLAN, PROFILE AND GRADING SHEETS. 2-FEET FINISH CONTOURS ARE SHOWN ON THE NEW ROADWAY BUT ARE SHOWN CONNECTING TO EXISTING CONTOURS ONLY IN SELECTED AREAS. WHERE 2-FEET CONTOURS ARE NOT SHOWN, FINISH SLOPES BETWEEN RESPECTIVE 10-FEET CONTOURS SHALL BE UNIFORM.

GENERAL NOTES (CONT)

- STATIONS USED TO LOCATE VARIOUS ROADWAY IMPROVEMENTS--GUTTERS, DITCHES, CULVERTS, GUARDRAILS, RETAINING WALLS, ETC.--ARE REFERENCED TO ROAD CENTERLINE STATIONING. ACTUAL LENGTHS OF GUTTERS, DITCHES, GUARDRAILS, RETAINING WALLS AND OTHER IMPROVEMENTS OFFSET FROM ROAD CENTERLINE SHALL BE ADJUSTED BY CONTRACTOR IN THE FIELD AS NECESSARY TO ACCOUNT FOR DIFFERENCES BETWEEN ROAD CENTERLINE DISTANCES AND OFFSET DISTANCES MEASURED AROUND CURVES.
- UNLESS OTHERWISE SPECIFIED, SHEET NUMBERS USED IN PLANS FOR CROSS REFERENCING AND DESIGNATING DETAIL DRAWINGS REFER TO THE OVERALL SHEET COUNT NUMBER SHOWN IN THE LOWER RIGHT MARGIN AND IN THE "SHEET NO." BLOCK IN THE UPPER RIGHT CORNER OF THE SHEET.

DRAINAGE NOTES

- CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL CULVERTS IN THE FIELD.
- CULVERTS WITHIN CATCH BASINS, GRATED DROP INLETS, AND STORM DRAIN MANHOLES SHALL BE CUT FLUSH WITH THE INSIDE FACE OF THE WALL. ABOVE WORK SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS.
- CONCRETE FOR CATCH BASINS, GRATED DROP INLETS, AND STORM DRAIN MANHOLES SHALL BE CLASS "A."
- PREMOLDED JOINT FILLER SHALL BE CONSIDERED INCIDENTAL TO CLASS "A" CONCRETE.
- TYPE A AND TYPE B GUTTERS MAY BE OF CLASS B CONCRETE, SHOTCRETE OR ASPHALT CONCRETE.
- CONSTRUCTION OF TRANSVERSE SUBSURFACE DRAINS SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION OF BASE COURSE SHOULDERS.
- INVERTS AT ENDS OF OFF-ROAD DITCHES ARE SHOWN ON PLAN, PROFILE AND GRADING SHEETS. UNLESS OTHERWISE SHOWN, PROFILE OF DITCH INVERTS BETWEEN ENDS SHALL MATCH, AS NEARLY PRACTICABLE, PROFILE OF ROAD CENTERLINE.
- CONTRACTOR SHALL HAVE THE OPTION OF USING ONE OF THE FOLLOWING MATERIALS FOR CULVERTS:  
(1) ALUMINUM/STEEL CORRUGATED METAL PIPE, 14 GAUGE  
(2) ALUMINUM/STEEL SPIRAL RIB METAL PIPE, 14 GAUGE  
(3) REINFORCED CONCRETE PIPE, CLASS III

DATE	_____
SURVEY PLOTTED BY	_____
DESIGNED BY	_____
TRACED BY	_____
NOTE BOOK	_____
QUANTITIES BY	_____
CHECKED BY	_____
NO.	_____

THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
*Royce S. Fukunaga*  
FUKUNAGA & ASSOCIATES

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**NOTES, ABBREVIATIONS  
AND LEGEND**

**MAUNA KEA OBSERVATORY ACCESS ROAD  
PHASE II-A**

PROJECT NO. HWY.-H-02-88