

EXHIBIT B

Act 262 1998
Capital Improvement Projects to be Funded
On Behalf of HECO

(Reprinted from the HECO and HELCO joint application filed on May 17, 1999, in Docket No. 99-0120, for approvals related to bond financing under Act 262 1998. The Commission approved the application by Decision and Order No. 17253, filed on September 27, 1999.)

**FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.**

TITLE OF PROJECT	Estimated Total Project Cost as of 12/31/98 (\$000)
NOTE: The number which appears in the parenthesis in the "Title of Project" is the Company's budget item identification number.	
 <u>LAND</u>	
LEILEHUA SUBSTATION SITE PURCHASE (ST-691-L1-1365) PURCHASE APPROXIMATELY 16,250 SQ. FOOT SITE WITHIN THE MILILANI HIGH TECH PARK FOR THE LEILEHUA SUBSTATION.	428
UPPER WAIAWA SUBSTATION SITE PURCHASE (BT-604-L1-1369) PURCHASE APPROXIMATELY 8 ACRES OF LAND WITHIN GENTRY HAWAII, LTD.'S WAIAWA DEVELOPMENT.	916
KALAHEO SUBSTATION SITE PURCHASE (ST-661-L1-1371) PURCHASE APPROXIMATELY 6,000 SQUARE FEET OF LAND AT THE KAILUA WASTE WATER TREATMENT PLANT.	244
KAKAAKO IMPROVEMENT DISTRICT 4 EASEMENT ACQUISITION (LL-137-L2-1356) PURCHASE EASEMENTS FOR FOUR TRANSFORMER VAULTS TO BE INSTALLED FOR THE KAKAAKO IMPROVEMENT DISTRICT 4 PROJECT.	91
WAIALUA-KUILIMA 46KV R/W (ST-459-L2-1374) PURCHASE RIGHT OF WAY FOR A 46KV LINE FROM THE WAIALUA SUBSTATION TO THE KUILIMA SUBSTATION.	944
TOTAL LAND	2,623
 <u>ADDITIONS TO GENERATION EQUIPMENT</u>	
KAHE 6 BURNER MANAGEMENT SYSTEM (BMS) REPLACEMENT (PP-143-P3-9008) REPLACE THE EXISTING KAHE 6 BMS WITH AN UPGRADED BURNER MANAGEMENT CONTROL SYSTEM.	928
KAHE 6 OPACITY MONITOR UPGRADE (PP-143-P3-9009) REPLACE THE KAHE 6 OPACITY MONITOR WITH A NEW, UPGRADED INSTRUMENT.	74
HONOLULU 9 VISCOSITY CONTROLS (PP-143-P1-9025) INSTALL FUEL OIL VISCOSITY CONTROLS ON HONOLULU UNIT NO. 9, WITH THE CAPABILITY TO CROSS-CONNECT TO HONOLULU UNIT NO. 8 FUEL OIL SYSTEM.	57
HONOULU 9 PRIMARY FUEL OIL PUMP (PP-143-P1-9027) REPLACE THE HONOLULU UNIT NO. 9 PRIMARY FUEL OIL PUMPS WITH ONES CAPABLE OF SUPPLYING SUFFICIENT PRESSURE FOR THE NEW STEAM ATOMIZERS.	68
KAHE 6 CEM DATA LOGGER UPGRADE (PP-143-P3-9029) INSTALL A FUEL OIL METERING SYSTEM WITH HIGH ACCURACY FOR HEAT RATE MONITORING AND UNIT TESTING.	48
KAHE 4 FEEDWATER HEATER #43 REPLACEMENT (PP-143-P3-9047) REPLACE THE EXISTING KAHE 4 FEEDWATER HEATER #43 DUE TO LEAKAGE	222
KAHE 6 BURNER SPIN VANE REGULATOR MODIFICATIONS (PP-143-P3-9050) PERFORM VARIOUS MODIFICATIONS TO THE KAHE 6 BURNERS TO FREE UP THE SPIN VANES AND ENSURE RELIABLE OPERATION OF THESE CRITICAL CONTROL DEVICES.	440
KAHE LUBE WATER MODIFICATION (PP-143-P3-9075) MODIFY THE KAHE LUBE WATER SYSTEMS.	46
HONOLULU 9 CONTROL ROOM RECORDERS UPGRADE (PP-143-P1-9107) REPLACE THE EXISTING HONOLULU UNIT 9 CONTROL ROOM RECORDERS (WHICH ARE AGED AND OBSOLETE) WITH PROGRAMMABLE ELECTRONIC RECORDERS.	423

**FACILITIES OF
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TITLE OF PROJECT	Estimated Total Project Cost as of 12/31/98 (\$000)
HONOLULU 9 OPACITY MONITOR REPLACEMENT (PP-143-P1-9173) REPLACE HONOLULU 9'S AGED BOILER SMOKE ANALYZER/RECORDER WITH AN UPGRADED MODEL.	96
HONOLULU 9 TURBINE SUPERVISORY INSTRUMENTATION (PP-143-P1-9231) INSTALL TURBINE SUPERVISORY INSTRUMENTATION ON THE HONOLULU UNIT 9 TURBINE.	125
KAHE DISCHARGE STRUCTURE CONCRETE TOPPING (PP-143-P3-9375) ADD A NEW CONCRETE DECK TOPPING OVER 2/3 OF THE EXISTING DISCHARGE STRUCTURE DECK.	1,087
KAHE 6 SOOTBLOWER CONTROLS UPGRADE (PP-143-P3-9383) REPLACE THE EXISTING KAHE 6 SOOTBLOWER WITH AN UPGRADED PROGRAMMABLE LOGIC CONTROL (PLC) - BASED CONTROL SYSTEM.	81
WAIUAU 7 FEEDWATER HEATER #72 REPLACEMENT (PP-143-P2-9398) REPLACE THE WAIUAU 7 FEEDWATER HEATER #72 (AND ITS INSTRUMENTATION).	239
WAIUAU 7 FEEDWATER HEATER #82 REPLACEMENT (PP-143-P2-9399) REPLACE THE WAIUAU 7 FEEDWATER HEATER #82 (AND ITS INSTRUMENTATION).	239
KAHE FIRE LINE ADDITION PHASE 2 (PP-143-P3-9400) ADD A BACKFLOW PREVENTER TO THE KAHE 5 AND KAHE 6 DOMESTIC WATER LINE.	20
KAHE FIRELINE BOOSTER PUMP PHASE 4 (PP-143-P3-9401) ADD A 4000 GPM BOOSTER PUMP AND ASSOCIATED EQUIPMENT TO THE FIRE SYSTEM NEAR THE TANK FARM AND DEMINERALIZER.	309
WAIUAU 9 COMPRESSOR BLADE PATH COATING (PP-143-P2-9419) COAT COMPRESSOR BLADES.	261
WAIUAU 10 COMPRESSOR BLADE PATH COATING (PP-143-P2-9420) COAT COMPRESSOR BLADES.	270
CORIOLIS FUEL OIL FLOWMETERS REPLACE THE FUEL OIL AREA METERS OF THE GENERATING UNITS WITH CORIOLIS MASS FLOWMETERS:	
KAHE 1 (PP-143-P3-9445)	62
KAHE 2 (PP-143-P3-9446)	91
KAHE 4 (PP-143-P3-9448)	73
KAHE 5 (PP-143-P3-9449)	74
KAHE 6 (PP-143-P3-9450)	97
WAIUAU 8 (PP-143-P3-9451)	69
HONOLULU 9 (PP-143-P3-9453)	72
KAHE 4 BOILER CONTROL UPGRADE (PP-143-P1-9454) COMPLETE THE UPGRADE OF THE BOILER CONTROL SYSTEM FOR KAHE 4.	2,848
KAHE 1 & 2 INSTRUMENT AIR COMPRESSOR (PP-143-P3-9472) REPLACE THE EXISTING COMPRESSOR WITH A ROTARY DESIGN AIR COMPRESSOR.	94
HONOLULU 9 STEAM ATOMIZER CONVERSION (PP-143-P1-9486) CONVERT THE HONOLULU 9 FIRING SYSTEM TO STEAM ATOMIZATION.	343
KAHE 6 AIRHEATER ACOUSTIC SOOTBLOWER (PP-143-P3-9492) RETROFIT THE KAHE 6 AIR HEATERS WITH SONIC SOOTBLOWERS.	181
KAHE 4 TURBINE CONTROL UPGRADE (PP-143-P3-9537) REPLACE THE MECHANICAL HYDRAULIC GOVERNOR CONTROLS WITH A MICRO-PROCESSOR BASED CONTROL SYSTEM .	732

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TITLE OF PROJECT	Estimated Total Project Cost as of 12/31/98 (\$000)
KAHE 3 TURBINE CONTROL UPGRADE (PP-143-P3-9538) REPLACE THE MECHANICAL HYDRAULIC GOVERNOR CONTROLS WITH A MICRO-PROCESSOR BASED CONTROL SYSTEM.	717
KAHE 3 BOILER CONTROL UPGRADE (PP-143-P3-9539) COMPLETE THE UPGRADE OF THE BOILER CONTROL SYSTEM FOR KAHE 3.	2,363
WAI AU 5 TURBINE CONTROL UPGRADE (PP-143-P2-9540) REPLACE THE MECHANICAL HYDRAULIC GOVERNOR CONTROLS WITH A MICRO-PROCESSOR BASED CONTROL SYSTEM.	812
PERFORMANCE MONITOR (PP-143) INSTALL CUSTOM-DESIGNED MONITORING SYSTEMS.	
KAHE 4 PERFORMANCE MONITOR (PP-143-P3-9541)	923
KAHE 3 PERFORMANCE MONITOR (PP-143-P3-9542)	883
KAHE 1 PERFORMANCE MONITOR (PP-401)	604
KAHE 2 PERFORMANCE MONITOR (PP-898)	667
KAHE CHEMICAL METERING PUMP UPGRADE (PP-441) UPGRADE THE CHEMICAL METERING PUMPS AND PUMP CONTROLS FOR KAHE 1, 2, AND 4.	330
KAHE 1 TURBINE SEAL UPGRADE (PP-442-P3-4420) UPGRADE THE PACKING AND SEALS IN THE KAHE 1 STEAM TURBINE TO IMPROVE THE UNIT'S HEAT RATE.	409
WAI AU 5 WELL WATER PRETREATMENT (PP-645) ADD WELL WATER PRETREATMENT FOR THE WAI AU 5 DEMINERALIZER.	802
WAI AU 3 CONDENSER REFURBISHMENT (PP-647) REFURBISH THE WAI AU 3 CONDENSER.	1,056
WAI AU 3 TURBINE UPGRADE (PP-648) UPGRADE COMPONENTS OF THE WAI AU 3 TURBINE.	59
KAHE 1 MAIN STEAM LINE REPLACEMENT (PP-650) REPLACE THE MAIN STEAM LINE FROM THE BOILER TO THE TURBINE WITH UPGRADED MATERIAL.	613
WAI AU 7 BOILER CONTROLS UPGRADE (PP-759) COMPLETE THE UPGRADE OF THE BOILER CONTROL SYSTEM FOR WAI AU 7.	2,803
WAI AU 7 TURBINE CONTROLS UPGRADE (PP-760) REPLACE THE MECHANICAL HYDRAULIC GOVERNOR CONTROLS WITH A MICRO-PROCESSOR BASED CONTROL SYSTEM.	694
WAI AU 8 BOILER CONTROLS UPGRADE (PP-765) COMPLETE THE UPGRADE OF THE BOILER CONTROL SYSTEM FOR WAI AU 8.	2,995
WAI AU 8 TURBINE CONTROLS UPGRADE (PP-769) REPLACE THE MECHANICAL HYDRAULIC GOVERNOR CONTROLS WITH A MICRO-PROCESSOR BASED CONTROL SYSTEM.	733
KAHE 4 GENERATOR RETAINING RING REPLACEMENT (PP-772) REPLACE THE GENERATOR RETAINING RING WITH A NEW RING.	372
WAI AU 4 EXCITER UPGRADE (PP-882) REPLACE THE EXISTING ROTATING EXCITER THAT IS OBSOLETE WITH A NEW, SOLID STATE EXCITER.	488
KAHE PIPELINE LEAK DETECTION (PS-187-P3-9251) INSTALL A COMPUTERIZED LEAK DETECTION SYSTEM ON THE KAHE PIPELINE.	55

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IWILEI / HONOLULU POWER PLANT PIPELINE RENOVATION PHASE 2 (PS-187-P1-9345) UPGRADE THE REMAINING IWILEI TO HONOLULU FUEL OIL PIPELINE COMPONENTS.	18
WAIU 8 CONTROL CABLE REPLACEMENT (PS-187-P2-9439) REPLACE OLD UNDERGROUND CABLES FROM THE SWITCHYARD CONTROL HOUSE TO THE WAIU 8 RELAY AND CONTROL BOARDS.	258
FUEL OIL TANK LEVEL GAUGE UPGRADE (PS-187-P6-9544) REPLACE EXISTING MANUAL TAPE MEASURING LEVEL SYSTEM ON HECO'S FUEL OIL TANKS AT WAIU, KAHE, AND HONOLULU POWER PLANTS WITH RADAR LEVEL GAUGES.	333
WAIU PRIMARY FUEL OIL MODIFICATIONS (PS-649) INSTALL BACKUP FOR THE WAIU PRIMARY FUEL OIL SYSTEM.	126
TOTAL ADDITIONS TO GENERATION EQUIPMENT	28,882
<u>BULK TRANSMISSION FACILITIES</u>	
KAHE FAULT RECORDER PHASE II (BT-147-S1-9215) ADD THE SECOND PHASE OF THE KAHE FAULT RECORDER SYSTEMS.	287
ARCHER SUBSTATION TO KEWALO SUBSTATION TRANSMISSION LINE (BT-467) INSTALL A 138KV UNDERGROUND TRANSMISSION LINE, TERMINATING EQUIPMENT, REGULATING EQUIPMENT, AND NECESSARY COMMUNICATIONS EQUIPMENT BETWEEN KEWALO SUBSTATION AND KAMOKU SUBSTATION. INSTALL TWO 138KV-25KV TRANSFORMERS AND FEEDERS AT THE KEWALO SUBSTATION.	38,898
KEWALO SUBSTATION TO KAMOKU SUBSTATION TRANSMISSION LINE (BT-476) INSTALL A 138 KV UNDERGROUND TRANSMISSION LINE, TERMINATING EQUIPMENT, REGULATING EQUIPMENT, AND NECESSARY COMMUNICATIONS EQUIPMENT, BETWEEN KEWALO SUBSTATION AND KAMOKU SUBSTATION.	41,795
PUKELE SUBSTATION SOUND LEVEL REDUCTION (BT-644) INSTALL ACTIVE NOISE CANCELLATION EQUIPMENT ON THE PUKELE SUBSTATION TRANSFORMERS.	125
KUNIA INTERCHANGE IMPROVEMENTS (BT-664) INSTALL NEW STEEL POLES, RELOCATE WOOD POLES, AND RELOCATE EXISTING CIRCUITS.	1,995
HALAWA / IWILEI 138KV SHIELD WIRE REPLACEMENT (BT-675) REPLACE DETERIORATING SHIELD WIRE FROM HALAWA SUBSTATION TO IWILEI SUBSTATION.	479
PUKELE LINES STRUCTURE UPGRADE (BT-684) UPGRADE ALUMINUM TOWERS ON TRANSMISSION LINES LEADING INTO THE PUKELE SUBSTATION.	1,209
KAHE BUS B BACKUP PROTECTION (BT-6862) INSTALL A BACKUP DIFFERENTIAL RELAY.	747
HALAWA/SCHOOL 138KV SHIELD WIRE REPLACEMENT (BT-689) REPLACE DETERIORATING SHIELD WIRE FROM HALAWA SUBSTATION TO SCHOOL ST. SUBSTATION.	80
AIRPORT - IWILEI 138KV SHIELD WIRE REPLACEMENT (BT-874) REPLACE DETERIORATING SHIELD WIRE FROM AIRPORT SUBSTATION TO IWILEI SUBSTATION.	629
TOTAL BULK TRANSMISSION FACILITIES	86,244
<u>SUBTRANSMISSION FACILITIES</u>	
AIKAHI LOAD TRANSFER (ST-148-S2-9042) REPLACE SPRING OPERATORS WITH MOTOR OPERATORS AND INSTALL BATTERIES AND BATTERY CABINETS.	133

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KAMOKILA SUBSTATION SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) (ST-148-S2-9384) INSTALL DISTRIBUTION SCADA AND COMMUNICATIONS AT KAMOKILA SUBSTATION.	519
WAIMALU SUBSTATION 46KV SWITCH UPGRADE (ST-148-S2-9391) REPLACE HYDRAULIC OPERATORS ON THE 46KV SWITCH NOS. 4985, 4986, AND 4987 WITH MOTOR OPERATORS AT THE WAIMALU SUBSTATION.	83
WAHIAWA-MIKILUA 46KV CIRCUIT RECONNECTION (ST-148-S2-9404) CHANGE THE #4 COPPER CONDUCTOR ON THE WAHIAWA-MIKILUA 46KV CIRCUIT BETWEEN SCHOFIELD AND KUNIA.	17
ENA SUBSTATION CAPACITOR BANK REPLACEMENT (ST-148-S2-9406) REPLACE THE ENA 1-ALA MOANA 12.47KV CIRCUIT'S FAILED CAPACITOR BANK AT THE ENA SUBSTATION WITH TWO 1800 KVAR CAPACITOR BANKS.	259
* WAIANA E SUBSTATION TRANSFORMERS (ST-456) DEVELOP A SUBSTATION ADEQUATE FOR FOUR 46KV TO 12KV TRANSFORMERS AND INSTALL ONE TRANSFORMER AND ASSOCIATED SWITCHGEAR.	1,424
* WAIALUA-KUILIMA 46 KV LINE (ST-459) INSTALL A NEW 46KV LINE FROM WAIALUA TO KUILIMA AND A CIRCUIT BREAKER IN THE WAIALUA SUBSTATION.	12,891
* KUNIA MAKAI SECOND TRANSFORMER (ST-477) INSTALL A SECOND 10/12.5 MVA TRANSFORMER AND A SECOND 46KV CIRCUIT AT THE KUNIA MAKAI SUBSTATION.	1,793
WAIPIO NO. 2 12KV UNDERGROUND (ST-612) INSTALL A SECOND 10/12.5MVA DISTRIBUTION SUBSTATION TRANSFORMER AND ASSOCIATED EQUIPMENT AT WAIPIO SUBSTATION.	764
ARCHER 44A CIRCUIT UPGRADE (ST-652) UPGRADE THE ARCHER 44A CIRCUIT BY UPGRADING THE 600MCM UNDERGROUND CABLE IN THE PIIKOI SUBSTATION AND REPLACING CERTAIN PORTIONS OF THE 600MCM UNDERGROUND CABLE.	741
KO OLINA SUBSTATION (ST-662) DEVELOP A NEW DISTRIBUTION SUBSTATION SITE IN THE KO OLINA DEVELOPMENT ADEQUATE FOR FOUR TRANSFORMERS. INSTALL ONE OF THE TRANSFORMERS AND ASSOCIATED SWITCHGEAR.	1,429
* WAI AU #42 46KV RE-INSTALLATION (ST-665) RE-INSTALL THE WAI AU #42 46KV CIRCUIT.	721
IWILEI 12 KV PROTECTIVE EQUIPMENT (ST-674) INSTALL PROTECTIVE EQUIPMENT (TRANSFORMERS, RELAYS, ETC.) ON THE IWILEI 12KV NETWORK SYSTEM.	166
KAMOKILA SUBSTATION (ST-770) PREPARE KAMOKILA SUBSTATION SITE FOR A DISTRIBUTION SUBSTATION AND INSTALL THE FIRST TRANSFORMER AND SWITCHGEAR. MAKE ASSOCIATED 12KV AND 46KV REARRANGEMENTS.	2,153
WAIMEA 4 KV CONVERSION (ST-796) PREPARE AND DEVELOP THE WAIMEA DISTRIBUTION SUBSTATION FOR 2 46KV-12KV TRANSFORMERS AND CONVERT THE EXISTING 4 KV FACILITIES TO 12KV.	1,427
PIIKIOI 3 TRANSFORMER 11.5-12.47 KV CONVERSION (ST-890) RECONFIGURING CIRCUITS AND CHANGING TRANSFORMER TAPS ON THE EXISTING TRANSFORMER.	128
TOTAL SUBTRANSMISSION FACILITIES	24,648

**FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.**

TITLE OF PROJECT	Estimated Total Project Cost as of 12/31/98 (\$000)
<u>OVERHEAD DISTRIBUTION PROJECTS</u>	
WAIKELE 46KV POLE RELOCATION (OM-153-O2-9001) RELOCATE APPROXIMATELY 10,000 CIRCUIT FEET OF THE WAIUAU-MILILANI 46KV LINE INCLUDING INSTALLATION OF NEW LINES AND NEW POLES.	213
MAKIKI 4 TO 12KV CONVERSION (OM-157-O3-9433) CONVERT MAKIKI 4KV CIRCUITS TO 12.47KV.	843
KANEOHE REARRANGEMENT (OM-158-O4-9261) REARRANGE KANEOHE SUBSTATION CIRCUITS.	75
MILILANI INTERCHANGE SOUTHBOUND RAMPS (OM-169-O7-9901) CONVERT OVERHEAD LINES TO UNDERGROUND.	224
PALEHUA CIRCUIT UPGRADE (OM-792) UPGRADE THE 12 KV PALEHUA CIRCUIT.	267
TOTAL OVERHEAD DISTRIBUTION PROJECTS	1,622
<u>UNDERGROUND DISTRIBUTION PROJECTS</u>	
KAKAAKO IMPROVEMENT DISTRICT 7 (UM-180-U3-9036) CONVERT OVERHEAD DISTRIBUTION LINES TO UNDERGROUND.	1,534
KAKAAKO IMPROVEMENT DISTRICT 4 (UM-180-U3-9525) CONVERT OVERHEAD DISTRIBUTION LINES TO UNDERGROUND.	2,380
KAKAAKO GATEWAY MAKAI IMPROVEMENT DISTRICT 5 (UM-180-U3-9805) CONVERT OVERHEAD DISTRIBUTION LINES TO UNDERGROUND.	281
CABLE REPLACEMENT ON LAGOON DRIVE (UM-182-U5-9051) INSTALL UNDERGROUND CABLE WITH HIGHER CAPACITY IN THE LAGOON 1-SOUTH RAMP AREA	90
SECTIONALIZING KANAINA CIRCUIT (UM-182-U5-9370) SECTIONALIZE THE KANAINA FUSE FEEDER.	31
KO OLINA CABLE INSTALLATION (UM-182-U5-9428) INSTALL UNDERGROUND CABLE WITH HIGHER CAPACITY IN THE KO OLINA RESORT DEVELOPMENT.	198
LUNA KAI SWITCHING VAULT UPGRADE (UM-182-U5-9491) REPLACE DETERIORATED SWITCHGEAR EQUIPMENT AND EXISTING ROOF AT THE LUNA KAI SWITCHING VAULT.	5
MAKALOA VAULT 2603 UPGRADE (UM-182-U5-9535) REPLACE DETERIORATED ELECTRICAL EQUIPMENT IN THE MAKALOA VAULT.	11
KALAKAUA SPLICE (UM-182-U5-9536) INSTALL DUCTS AND A 3-PHASE UNDERGROUND CABLE AND NEUTRAL NEAR THE ROYAL HAWAIIAN SHOPPING CENTER.	131
DOWNTOWN NETWORK PRIMARY RECONFIGURATION (UM-626) SEPARATE THE THREE DOWNTOWN NETWORKS INTO EITHER SPOT OR GRID NETWORKS.	2,083
IWILEI 25KV NIMITZ (UM-630) INSTALL TWO 25K UNDERGROUND CIRCUITS FROM IWILEI TO NIMITZ HWY AND INSTALL AN OVERHEAD CIRCUIT FROM NIMITZ HWY. TO YOUNG BROS.	2,855
SALT LAKE BOULEVARD ROAD WIDENING (UM-641) RELOCATE 46KV AND 12KV OVERHEAD LINES AND CONVERT THE 12KV OVERHEAD LINES TO UNDERGROUND BY INSTALLING NEW EQUIPMENT.	1,921

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NETWORK CABLE PROTECTION (UM-658) INSTALL IMPROVED ARC PROOFING ON ALL PRIMARY CABLES, INSTALL CORROSION PROTECTION ON ALL PRIMARY SPLICES AND INSTALL DUCT SEALS ON ALL DUCTS IN THE DOWNTOWN NETWORK.	562
KAMEHAMEHA HIGHWAY CONVERSION (UM-840) CONVERT THE OVERHEAD LINES TO UNDERGROUND ON KAMEHAMEHA HWY FROM THE WAIU POWER PLANT TO HONOMANU STREET.	10,662
KAM HIGHWAY SERVICE CONVERSION WEST (UM-844) CONVERT EXISTING OVERHEAD SERVICES TO UNDERGROUND ALONG KAMEHAMEHA HIGHWAY FROM THE WAIAWA INTERCHANGE TO THE WAIU POWER PLANT.	5,007
TOTAL UNDERGROUND DISTRIBUTION PROJECTS	27,751
 <u>COMMUNICATION FACILITIES</u>	
ROCKWELL TO L&G PROTOCOL CONVERSION (CM-150-S4-9000) CONVERT TEN (10) EXISTING SUBSTATION REMOTE TERMINAL UNITS (RTU'S) FROM ROCKWELL TO LANDIS AND GYR PROTOCOL.	102
EMS SIMPACT BOARD REPLACEMENT (CM-150-S5-9026) DEVELOP AN ADDITIONAL FRONT END PROCESSOR THAT UTILIZES NON PROPRIETARY TECHNOLOGY TO COMMUNICATE WITH THE TELEGYR RTU'S.	76
REPLACE OBSOLETE MICROWAVE COMMUNICATION EQUIPMENT FOR THE FOLLOWING MICROWAVE COMMUNICATION LINKS: PUKELE-TO-WARD AVENUE (CM-150-S4-9188) MALAE-TO-KOOLAU (CM-150-S4-9262)	591 523
SCADA COMMUNICATION (CM-150) INSTALL COMMUNICATIONS TO RECLOSERS AT VARIOUS LOCATIONS FOR REMOTE CONTROL / STATUS AND ANALOG READINGS: MAKAHA / MAKAHA (CM-150- S4-9547) KAHE / KAHE (CM-150-S4-9548) MIKILUA 1 - MIKILUA 1 (CM-150-S4-9549) MAKAHA 2- MAUKA (CM-150-S4-9550) MIKILUA 2 - MIKILUA 3 (CM-150-S4-9599)	79 107 97 105 79
WAIU 9 GENERATION CONTROL UNIT (GCU) REPLACEMENT (CM-427-S4-4270) REPLACE THE EXISTING ROCKWELL INT'L GCU AND GENERATION CONTROL PANELS (GCP)	92
WAIU 10 GCU REPLACEMENT (CM-427-S4-4270) REPLACE THE EXISTING ROCKWELL INT'L GCU AND GCP	59
KAHE-TO-HALAWA TONE EQUIPMENT REPLACEMENT (CM-720-S4-7202) REPLACE THE LENKURT PERMISSIVE TRIP TONE CHANNEL EQUIPMENT FOR KAHE-TO-HALAWA COMMUNICATION LINK.	349
NORTH SHORE DISTRIBUTION AUTOMATION COMMUNICATION (CM-727) INITIATE A DISTRIBUTION AUTOMATION COMMUNICATION PROGRAM TO ALLOW THE WARD AVENUE LOAD DISPATCH TO CONTROL THE DISTRIBUTION AUTOMATION SYSTEMS AT HAUULA, KAHUKU, KUILIMA, AND WAIMEA SUBSTATIONS.	300
HONOLULU POWER PLANT GCU REPLACEMENT (CM-781) REPLACE OBSOLETE GENERATION CONTROL UNITS (GCU) AND GENERATION CONTROL PANELS AT THE HONOLULU POWER PLANT WITH NEW PROGRAMMABLE GCUS.	172
TRIPLER-WAIIAWA MICROWAVE REPLACEMENT (CM-829) REPLACE OBSOLETE ANTENNAS, RADIO AND MISCELLANEOUS EQUIPMENT.	504

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ROCKWELL MICROWAVE RADIO REPLACEMENT (CM-830) REPLACE AND UPGRADE OBSOLETE ROCKWELL ANALOG MICROWAVE RADIO EQUIPMENT WITH DIGITAL MICROWAVE EQUIPMENT FOR THE FOLLOWING COMMUNICATION LINKS:	
WARD-TO-TRIPLER MICROWAVE REPLACEMENT (CM-830-S4-8300)	347
TRIPLER-TO-WAIAU MICROWAVE REPLACEMENT (CM-830-S4-8301)	344
WAIAU-TO-PUU MANAWAHUA MICROWAVE REPLACEMENT (CM-830-S4-8302)	357
PUU MANAWAHUA-TO-CAMPBELL INDUS PRK MICROWAVE REPLACEMENT (CM-830-S4-8303)	353
CAMPBELL INDUS PRK-TO-KAHE MICROWAVE REPLACEMENT (CM-830-S4-8304)	355
KAHE-TO-HONOLULU POWER PLANT MICROWAVE REPLACEMENT (CM-830-S4-8305)	361
HONOLULU POWER PLANT-TO-WARD VIDEO EQUIPMENT REPLACEMENT (CM-830-S4-8306)	364
 KOOLAU / TRIPLER MICROWAVE REPLACEMENT (CM-847) REPLACE OBSOLETE ANTENNAS, RADIO AND MISCELLANEOUS EQUIPMENT OF THE COMMUNICATION SYSTEM.	 989
 ANALOG MICROWAVE / FIBER CONVERSION PART 1 (CM-869) INSTALL COMMUNICATION EQUIPMENT NEEDED ON THE FIBER OPTIC SYSTEM FOR THE CONVERSION OF ANALOG MICROWAVE COMMUNICATION EQUIPMENT TO DIGITAL:	
WARD ANALOG MW CONVERSION (S4-8690)	210
HONOLULU POWER PLANT ANALOG MW CONVERSION (S4-8691)	37
TRIPLER ANALOG MW CONVERSION (S4-8692)	145
HALAWA ANALOG MW CONVERSION (S4-8693)	181
MAKALAPA ANALOG MW CONVERSION (S4-8694)	171
WAIAU ANALOG MW CONVERSION (S4-8695)	139
EWA NUI ANALOG MW CONVERSION (S4-8696)	143
PM ANALOG MW CONVERSION (S4-8697)	104
KALAELOA ANALOG MW CONVERSION (S4-8698)	46
CEIP ANALOG MW CONVERSION (S4-8699)	141
KAHE SWYD ANALOG MW CONVERSION (S4-8710)	138
KAHE PT ANALOG MW CONVERSION (S4-8711)	53
SYSTEM CUT OVER (WARD) (S4-8712)	173
 ENERGY MANAGEMENT SYSTEM (EMS) REPLACEMENT (CM-896) REPLACE THE CURRENT OUTDATED AND UNSUPPORTED ROCKWELL EMS SYSTEM.	 2,506
 TOTAL COMMUNICATION FACILITIES	 <hr style="width: 100%; border: 0.5px solid black;"/> 10,892
 <u>MINOR / MISCELLANEOUS PROJECTS</u>	
 ** MISCELLANEOUS POWER PLANT ADDITIONS (PP-143-P4-1429) MISCELLANEOUS ADDITIONS TO POWER PLANT FACILITIES AT THE HONOLULU, WAIAU, AND KAHE GENERATING STATIONS.	 3,283
 ** POWER STATION MISCELLANEOUS (PS-187-P4-1870) MINOR POWER STATION ADDITIONS.	 325
 ** MINOR SUBSTATION ADDITIONS (BT-147-S1-1470) MINOR BULK TRANSMISSION SUBSTATION ADDITIONS, REPLACEMENTS, AND MINOR MODIFICATION OF EXISTING EQUIPMENT.	 1,306
 ** MINOR DISTRIBUTION SUBSTATION ADDITIONS (ST-148-S2-1480) MINOR DISTRIBUTION SUBSTATION AND SUBTRANSMISSION SYSTEM ADDITIONS, REPLACEMENTS, AND MODIFICATION OF EXISTING EQUIPMENT.	 1,982
 ** MINOR OVERHEAD SUBTRANSMISSION ADDITIONS (ST-148-O4-1650) MINOR OVERHEAD LINE ADDITIONS, RECONDUCTORING AND / OR CONSTRUCTING 46KV LINES (INCLUDING 12KV IF ON THE SAME POLE).	 902
 ** POLEMOUNT TRANSFORMER INSTALLATION (OM-158-O4-1789) INSTALL POLEMOUNT-TYPE TRANSFORMERS.	 1,739

**FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.**

TITLE OF PROJECT	Estimated Total Project Cost as of 12/31/98 (\$000)
** MINOR DISTRIBUTION DESIGN OVERHEAD ADDITION (OM-158-O4-1990) RECONDUCTOR AND CONSTRUCT VARIOUS 12KV AND 4KV LINES AND MAKE MINOR DISTRIBUTION SYSTEM VOLTAGE LEVEL ADJUSTMENTS.	929
** RECONDITIONING OF UNDERGROUND DISTRIBUTION CABLES (UM-126- U3-1260) RECONDITION UNDERGROUND DISTRIBUTION CABLES WITH DETERIORATED INSULATION.	6,240
** REPLACE UNDERGROUND DISTRIBUTION CABLES / SWITCHGEAR (UM-126-U3-1265) REPLACE DETERIORATED CABLES.	514
** MISCELLANEOUS CABLE FAILURE REPLACEMENT (UM-181-U4-1810) REPLACE FAULTED CABLES.	11,178
** PADMOUNT TRANSFORMER INSTALLATION (UM-182-U5-1793) REPLACE DETERIORATED DISTRIBUTION EQUIPMENT.	2,912
TOTAL MINOR / MISCELLANEOUS PROJECTS	31,310
GRAND TOTAL	213,972

* Projects which have had or may have to be the subject of a public hearing pursuant to HRS Section 269-27.5.

** Information in column labeled "Estimated Total Project Cost" reflects forecast total cost for the period 1999 - 2003.

EXHIBIT C

Act 262 1998
Capital Improvement Projects to be Funded
On Behalf of HECO

(Reprinted from HECO's "Motion for Approval and Certification of Supplemental Projects" filed on May 17, 2002 in Docket No. 99-0120, the HECO and HELCO joint application for approvals related to bond financing under Act 262 1998. The Commission approved the motion by Decision and Order No. 19525, filed on August 15, 2002.)

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
<u>COMMUNICATION</u>		
Frequency and Voltage for Kalaeloa Add monitoring of Kalaeloa bus voltage and frequency to the data acquisition system in Load Dispatch.	P0000157	73
Power Plant Ultra High Frequency Radios Install a repeater at Puu Manawahua Communications Station and base station and remote control units at Waiiau Power Plant, Honolulu Power Plant, Kahe Power Plant, and Ward Dispatch Center.	P0000448	230
Microwave Replacement Replace the existing Digital Microwave Corporation radio equipment with digital microwave radios:		
Puu Manawahua-Makalapa	P0000508	153
Puu Manawahua-Ewa Nui	P0000509	153
Ewa Nui - Campbell Estate Industrial Park Optical Ground Wire Replace Replace a section of fiber optic medium located in the Ewa Nui-Campbell Estate Industrial Park and Ewa Nui-Kalaeloa 138 kV transmission lines.	P0000595	129
Ward - Puu Manawahua Microwave Installation Install a digital microwave link between Ward and Puu Manawahua communication stations.	P6760000	258
Puu Manawahua - Kahe Point Microwave Installation Install a digital microwave link between Puu Manawahua and Kahe Point communication stations.	P6770000	227
Mobile Radio Replacement Replace the existing base stations, antennas and associated equipment operating on Frequency 1 and Frequency 2 at the following locations: Laie Mobile Radio Station, Malae Communication Station, Tripler Microwave Station, Mokuleia Station, Ward Microwave Station, Kokohead Mobile Radio Station and Kahe Point Microwave Station. Upgrade equipment grounding and lightning protection systems at these sites. Replace existing control consoles in Ward Avenue load dispatch.	P9028000	703
450 MHz Radio Replacement Replace the 450 MHz radio system at Koko Head, Laie, Malae, Mokuleia, Wahiawa, and Ward Avenue.	P9243000	210
Mobile Radio - Frequency 4 Install a mobile base station radio and related equipment at the Puu Manawahua communications site.	P9496000	143
Honolulu Power Plant Spur Transfer all voice and data channels from the existing video cable link between Ward Avenue and the Honolulu Power Plant to fiber optic cable. Install associated equipment to support fiber optic digital communications between Ward Avenue and the Honolulu Power Plant.	P9497000	156

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Kalaheo Repeater Structure Replacement Replace existing Kalaheo repeater monopole structure in Kailua. The Kalaheo Repeater is located on the hillside of Kapaa Quarry.	P9502000	63
Generation Hotline Upgrade Replace the existing Executone generation hotline communication system and speakers in each generator control room at the Waiau, Kahe, and Honolulu power plants as well as the Ward Avenue system dispatch office.	P9511000	51
TOTAL COMMUNICATION FACILITIES		2,549

DISTRIBUTION

Barber's Point Naval Air Station Privatization (Y00004)

Upgrade the Barber's Point Naval Air Station (BPNAS) electrical distribution system.

BPNAS Substation A Upgrade	P0000113	167
BPNAS Substation B Upgrade	P0000114	100
BPNAS Substation C Upgrade	P0000115	100
BPNAS Substation D Upgrade	P0000116	100
Keaahala Road Widening Relocate eight distribution 12kV and 4kV poles along Keaahala Road from Kahekili Highway to Pookela Street in Kaneohe.	P0000135	168
Salt Lake Boulevard Widening Phase 2 Convert existing 46kV, 12kV, and secondary overhead lines on Salt Lake Boulevard, from Bougainville Drive to Reeves Street, to underground. Temporarily relocate overhead lines for construction.	P0000143	6,878
Kakaako Improvement District 9 Convert existing 12kV overhead lines on Ilalo Street, from Ahui Street to Forrest Avenue, to underground.	P0000162	2,735
Kapiolani Substation Switch Installation Install a 46kV switch in the Kapiolani Substation.	P0000177	47
Waikiki Rehabilitation Project 1 Replace cable and outdated transformers from the ewa side of Waikiki (area bounded by Ala Wai Canal and Kalakaua Ave).	P0000190	1,196
Waikiki Rehabilitation Project 2 Replace cable and outdated transformers from the middle area of Waikiki (area bounded by Ala Wai Canal, Kalakaua Ave, and Lewers St.).	P0000191	1,586
Waialae Nui Reliability Improvement Install two automatic transfer switch vaults in the Waialae Nui Ridge area and tie the existing single phase vaults in the area to the fused feeders from the switch vaults.	P0000218	389

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Waihee #1 Circuit Extension Extend two circuits along Hui Alala Street from Hui Lo Street to Hui Iwa Street to provide a backup 12kV feeder to Temple Valley Subdivision.	P0000275	317
New Kuahua Substation (Y00021) Replace the existing Kuahua Substation with a new substation . Initially, two 20/33MVA transformers will be installed, with provisions for a third 20/33MVA transformer. Project also includes revising protection schemes at Makalapa and Puuloa Substations, and installing fiber optic cable between Makalapa and Kuahua and Makalapa and Puuloa Substations as these stations are all tied together.		
New Kuahua Substation	P0000277	4,031
Makalapa Substation Protection	P0000278	256
Puuloa Substation Protection	P0000279	94
Makalapa-Kuahua Fiber Optic Line	P0000280 ***	735
Makalapa-Puuloa Fiber Optic Line	P0000281 ***	525
Kuahua 46kV Line Reconnection	P0000282	426
Kunia Makai 12kV Circuit Extension Extend Kunia Makai #2 12.47kV circuit, install one bank of auto-transformers, and convert a portion of an overhead line from 11.5kV to 12.47kV.	P0000284	112
Emma 4kV Conversion Convert the 4kV loads from the Emma Substation to 12kV.	P0000288	680
Laumaka Street Improvement Install four wood poles along Laumaka Street, Bannister Street and Wilcox Lane.	P0000325	44
International Savings & Loan Vault Construct a submersible vault with network transformers in the sidewalk area across the street from the International Savings & Loan Building on Bethel Street.	P0000335	357
Kam Highway Improvement at Leilehua Relocate one 12kV distribution pole and one anchor, convert one span of 12kV overhead lines to underground, and adjust two handholes.	P0000373	44
Kahala Kua Secondary Replacement Install new secondary cables in ducts to replace the existing direct buried cables in the Upper Waialae Iki-Kahala Kua Subdivision.	P0000390	507
Ka Iwi 12kV Overhead to Underground, Phase 1, Increment 1 Convert existing single-phase 12kV overhead conductors between Poles P11 and P15 Kalaniana'ole Hwy to underground.	P0000402	155
Waimalu Cable Replacement Replace all four Waimalu circuit underground cables from Waimalu Substation to Handhole 4 on Kaahumanu Street.	P0000409	213

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Waimalu #3 Circuit Improvement Install a fault interrupter switch at Waimalu substation and reconfigure the Waimalu 3 and Kaonohi 1 circuits.	P0000410	84
East-West Center #3 Transformer Replacement Replace the East-West Center #3 transformer.	P0000421	358
Museum 4kV Conversion Convert the Museum Park 4kV circuit along King Street from Waiakamilo Road to Kokea Street and reconnect to the existing Hala 1 - Hala 2 11.5kV Circuit.	P0000422	202
Kailua Road Underground Conversion Convert distribution overhead lines to underground along Kailua Road from Kuulei Avenue to Hahani Street.	P0000423	1,080
Wahiawa Height Tree Wire Installation Reconductor overhead primary conductors on California Ave. between P69 and P103 with tree wire.	P0000436	192
Pauoa 4kV Conversion Convert portions of the Pauoa and Booth Rd. 4kV circuits to the Pauoa 1 12kV circuit. Install 12-4kv stepdown transformers on Pauoa Rd., Booth Rd., and Pacific Heights Rd.	P0000444	114
Waialua Sugar Company Privatization Acquire and upgrade portion of Waialua Sugar Company's electrical distribution system. (Note: costs to acquire WSC's system to be excluded from revenue bond financing.)	P0000474	1,471
Mauka Circuit Reliability Improvement Replace riser disconnects with fuses and extend single phase underground cables in Waianae Valley.	P0000496	94
2100 Kalakaua Install new underground service to new customer development at 2100 Kalakaua Ave.	P0000513	310
Ko Olina Cable Installation Install underground cable and neutral in existing ducts on Aliinui Drive in the Ko Olina Resort Development.	P0000515	312
Kaimuki Traffic Calming Relocate 12kV overhead lines to steel poles and convert 4kV and secondary overhead lines on Waialae Ave. between Wilhelmina Rise and 11th Ave to underground.	P0000536	576

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Mokuone 46-12kV Substation (Y00027) Extend Iwilei #1 and #2 46kV circuits from Sand Island Substation to Mokuone Substation along Sand Island Parkway Road. Install one 46-12kV, 10/12.5MVA transformer and associated switchgear.		
Mokuone 46-12kV Line Extension	P0000562	987
Mokuone 46-12kV Substation 1	P0000563	1,109
Kalaheo Transformer Replace Install a 46-12kV distribution transformer.	P0000572	342
Nimitz Hwy Rehabilitation Relocate approximately thirteen wood poles, one handhole, and two segments of ductline, and adjust approximately seven handholes and twenty-seven manholes.	P0000575	257
Camp Smith #2 6.25MVA Transformer (Y00028) Install a second 46-11.5kV, 5/6.25MVA transformer and associated switchgear at the Camp Smith Substation and extend the Halawa #4 46kV line to the substation.		
* Camp Smith #2 Transformer 46KV Line Extension	P0000577 ***	81
Camp Smith #2 6.25MVA Transformer	P0000578	1,159
Hawaii Metal Recycling Substation Transformer Replacement 5MVA Replace existing transformer with a 5 MVA transformer. Reconnector section of the 4kV bus and replace disconnect switch.	P0000581	196
Kakaako Improvement District 7 Kamakee St Conversion Convert existing distribution overhead lines along Kamakee St. from Auahi St. to Queen St., to underground.	P9036000	2,172
Aiea Heights Road Widening Relocate 3 wood poles along Aiea Heights Drive to accommodate a road widening project by the Aiea Industrial Subdivision.	P9084000	92
Puuloa Road Widening Relocate existing 46kV, 12kV, and secondary overhead lines on Puuloa Rd. from Salt Lake Blvd. to Kamehameha Hwy to steel poles.	P9903000	1,213
TOTAL DISTRIBUTION		34,363
<u>LAND</u>		
Conversion Halawa-School 138kV Convert term easements that make up Halawa-School 138kV line.	P0000063	233
TOTAL LAND		233
<u>PRODUCTION</u>		
Kahe Fire Water Storage Tank Install water storage tank and water lines at Kahe Power Plant.	P0000052	397

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Honolulu 9 Boiler Electric Warming System Install heaters, valves, piping and instrumentation on the boiler.	P0000057	145
Waiau Fuel Pipeline Install underground fuel oil pipeline and ancillary facilities from HECO's Barbers Point tank farm to the Waiau power station.	P0000064	26,995
Boiler Drum Safety Valve Replace boiler drum safety valves.		
Waiau 4 Boiler Drum Safety Valve	P0000074	50
Honolulu 9 Boiler Drum Safety Valve	P0000195	73
Waiau 3 Boiler Drum Safety Valve	P9115000	47
Boiler Controls Install a microprocessor based distributed control system with cathode ray tube operator interface stations.		
Kahe 5 Boiler Controls	P0000078	2,348
Kahe 6 Boiler Controls	P0000079	2,375
Cycle Chemistry Instrumentation Install instrumentation to enable the plant operators to continuously monitor the boiler's cycle chemistry parameters.		
Kahe 3 Cycle Chemistry Instrumentation	P0000082	338
Kahe 4 Cycle Chemistry Instrumentation	P0000083	162
Kahe 5 Cycle Chemistry Instrumentation	P0000084	454
Kahe 6 Cycle Chemistry Instrumentation	P0000085	317
Waiau 3 Cycle Chemistry Instrumentation	P0000208	314
Waiau 4 Cycle Chemistry Instrumentation	P0000209	310
Waiau 5 Cycle Chemistry Instrumentation	P0000210	307
Waiau 6 Cycle Chemistry Instrumentation	P0000211	376
Waiau 7 Cycle Chemistry Instrumentation	P0000212	417
Waiau 8 Cycle Chemistry Instrumentation	P0000213	358
Kahe 1 Cycle Chemistry Instrumentation	P0000214	372
Kahe 2 Cycle Chemistry Instrumentation	P0000215	337
Honolulu 8 Cycle Chemistry Instrumentation	P0000216	309
Honolulu 9 Cycle Chemistry Instrumentation	P0000217	307
Waiau Wastewater Oil Detectors Install oil detector instrumentation in the wastewater treatment facility.	P0000086	29
Opacity Monitor Replace opacity monitor.		
Kahe 3 Opacity Monitor	P0000087	50
Kahe 1 Opacity Monitor	P0000584	82
Honolulu 9 Attemperator Block Valve Install a superheater attemperator spray block valve and controls.	P0000091	66

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Waiau 8 Sootblower Controls Replace sootblower controls.	P0000097	302
Waiau 7 Stack Relining Replace the existing stack liner.	P0000155	174
Iwilei Fuel Oil Pump Install a new centrifugal pump at Iwilei Tank Farm.	P0000172	86
Waiau 8 Main Steam Stop Valve Replace the main steam stop valve with a new valve and actuator.	P0000200	74
Feedwater Heater Replace feedwater heater and its associated instrumentation.		
Kahe Feedwater Heater #12	P0000301	211
Waiau Feedwater Heater #72	P0000302	188
Waiau Feedwater Heater #82	P0000303	199
Waiau Feedwater Heater #64	P0000437	275
Waiau Feedwater Heater #74	P0000438	309
Waiau Feedwater Heater #63	P0000439	198
Kahe Feedwater Heater #33	P0000482	279
Waiau Feedwater Heater #75	P0000484	342
Kahe Feedwater Heater #11	P0000494	223
Ignitors Replace existing ignitors.		
Waiau 4 Ignitor	P0000203	136
Waiau 3 Ignitor	P0000330	139
Waiau 9 & Waiau 10 Cardox Fire Protection Replace Cardox fire protection system.	P0000220	313
Kahe 6 Ignitor Fuel Storage Increase the ignitor (diesel oil) storage capacity of Kahe 6.	P0000221	108
Fuel Oil Heaters Install new tube bundles for each of the fuel oil heaters.		
Waiau 3 Fuel Oil Heaters	P0000222	75
Waiau 4 Fuel Oil Heaters	P0000227	49
Air Preheater Rotor Replace air preheater rotor with a new rotor assembly, including elements and accessories.		
Waiau 5 Air Preheater Rotor	P0000224	1,206
Waiau 6 Air Preheater Rotor	P0000225	1,189

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Honolulu 8 & Honolulu 9 Instrument Air Compressor Install rotary screw type air compressors with accessories.	P0000226	137
Superheat & Reheat Attenuation Spray		
Replace the superheat and reheat attenuation block and control valves.		
Kahe 5 Superheat & Reheat Attenuation Spray	P0000228	110
Kahe 6 Superheat & Reheat Attenuation Spray	P0000229	126
Waiau 7 Superheat & Reheat Attenuation Spray	P0000230	108
Waiau 8 Superheat & Reheat Attenuation Spray	P0000232	108
Kahe 1 Superheat & Reheat Attenuation Spray	P0000239	158
Kahe 2 Superheat & Reheat Attenuation Spray	P0000240	93
Kahe 3 Superheat & Reheat Attenuation Spray	P0000241	68
Kahe 4 Superheat & Reheat Attenuation Spray	P0000242	112
Boiler Feed Pump Recirculation Control Valves		
Install metal-seated ball valves in place of existing globe valves.		
Waiau 8 Boiler Feed Pump Recirculation Control Valves	P0000231	56
Kahe 1 Boiler Feed Pump Recirculation Control Valves	P0000234	53
Kahe 2 Boiler Feed Pump Recirculation Control Valves	P0000235	36
Kahe 3 Boiler Feed Pump Recirculation Control Valves	P0000236	57
Kahe 6 Boiler Feed Pump Recirculation Control Valves	P0000238	57
Service Air Compressor		
Install rotary screw type air compressors with accessories.		
Waiau 7 & Waiau 8 Service Air Compressor	P0000233	154
Kahe 3 & Kahe 4 Service Air Compressor	P0000466	95
Waiau Sheetpiling Cathodic Protection	P0000253	179
Install cathodic protection for the sheetpile wall that separates the circulating water intake and discharge for the Waiau 5, 6, 7 and 8 units.		
Stack & Breeching		
Replace the stack and breeching.		
Waiau 3 Stack & Breeching	P0000254	294
Waiau 4 Stack & Breeching	P0000255	214
Data Acquisition & Monitoring		
Install a performance monitoring data acquisition system.		
Waiau 3 Data Acquisition & Monitoring	P0000260	32
Waiau 4 Data Acquisition & Monitoring	P0000261	79
Waiau 5 Data Acquisition & Monitoring	P0000262	120
Honolulu 9 Data Acquisition & Monitoring	P0000264	92
Honolulu 8 Data Acquisition & Monitoring	P0000265	35
Kahe 6 Data Acquisition & Monitoring	P0000266	455
Kahe 5 Data Acquisition & Monitoring	P0000267	488

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Waiau 5 Curtis Row 1 Blades Replace the first row of rotating blades on the high pressure turbine curtis stage with anti-solid particle erosion coated blading.	P0000268	75
Honolulu Power Plant Wastewater Treatment Facility Batch Tank Modifications Modify the existing wastewater treatment facility batch treatment tanks.	P0000298	372
Waiau Emergency Tank Conversion Construct a roof on the Waiau Wastewater Treatment Facility Emergency Tank and line the tank with internal protective coating.	P0000304	287
Traveling Screen Replace traveling screen assembly.		
Honolulu Traveling Screen 91	P0000311	119
Waiau Traveling Screen 42	P0000374	120
Waiau Traveling Screen 31	P0000375	125
Waiau Traveling Screen 41	P0000440	126
Waiau Traveling Screen 32	P0000443	127
Kahe Traveling Screen 61	P0000576	153
Kahe 3 Recorders/Transmitters Replace pneumatic recorders and transmitters in the Kahe 3 control board.	P0000312	88
Air Preheater Sootblower Replace the air preheater sootblowers with retractable multiple nozzle tracking sootblowers.		
Waiau 8 Air Preheater Sootblower	P0000313	287
Waiau 7 Air Preheater Sootblower	P0000314	285
Air Heater Steam Coil Install steam coils in the ductwork upstream of the boiler air preheaters.		
Waiau 7 Air Heater Steam Coil	P0000315	154
Waiau 8 Air Heater Steam Coil	P0000316	155
Flue Gas Oxygen Analyzer Install two in-situ oxygen detectors to monitor flue gas oxygen levels.		
Kahe 3 Flue Gas Oxygen Analyzer	P0000326	38
Kahe 4 Flue Gas Oxygen Analyzer	P0000327	96
Kahe 5 Flue Gas Oxygen Analyzer	P0000328	95
Kahe 6 Flue Gas Oxygen Analyzer	P0000329	94
Honolulu 8 Turbine Steam Gland Conversion Replace high pressure turbine cylinder outer water gland with a new-design steam gland.	P0000331	236
Waiau 5 & Waiau 6 Chemical Room Relocation Relocate the Waiau 5 and 6 boiler chemical feed tanks and pumps from the second floor to the ground floor and install new pressurized mixing and delivery system.	P0000365	337

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
PI Data Loggers Purchase and program approximately twenty-two portable data terminals with integrated scanners and associated hardware/software at the Honolulu, Waiiau and Kahe power plants. (The PI system is a data acquisition and monitoring system.)	P0000379	106
Waiiau 8 Heater Drip Pump Replace Heater Drip Pump.	P0000392	48
Hydrogen Purity Meter Replace hydrogen purity meter.		
Waiiau 6 Hydrogen Purity Meter	P0000412	62
Waiiau 4 Hydrogen Purity Meter	P0000413	42
Waiiau 5 Hydrogen Purity Meter	P0000416	76
Kahe 6 Hydrogen Purity Meter	P0000417	75
Honolulu 9 Hydrogen Purity Meter	P0000488	67
Waiiau Service Water Pump 71 Replace Service Water Pump 71.	P0000414	49
Waiiau 8 Hog Jet Silencing Install muffler to redirect outlet of tail pipe.	P0000446	33
Kahe 6 Fan Enclosure Replace the Kahe 6 Fan Enclosure.	P0000454	537
Honolulu 9 Stack Lining Install an acid resistant liner on the inside of the Honolulu 9 Stack.	P0000457	208
Electromatic Relief Valve Replace the electromatic relief valve.		
Waiiau 3 Electromatic Relief Valve	P0000459	77
Waiiau 4 Electromatic Relief Valve	P0000460	67
Waiiau 5 Electromatic Relief Valve	P0000461	66
Waiiau 7 Electromatic Relief Valve	P0000462	66
Waiiau 8 Electromatic Relief Valve	P0000463	65
Waiiau 5 Wastewater Sump Replace the existing sump pump.	P0000464	134
Control Room AC Replace the air conditioning system equipment.		
Waiiau 7 & Waiiau 8 Control Room Air Conditioner	P0000470	63
Kahe 5 & Kahe 6 Control Room Air Conditioner	P0000475	77
Honolulu Power Plant Chemical Cleaing Ammonia Scrubber Install an ammonia scrubber.	P0000477	84

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Waiau Springs Kamehameha Hwy Fence Install PVC coated chain link fence along Kamehameha Highway and the area near Waiau Springs at Waiau Power Plant.	P0000478	85
Kahe 3 & Kahe 4 Sootblower Platform Install steel framing and grating at the 7th and 8th floors of the Kahe Units 3 and 4.	P0000479	89
Kahe 1 Fan Sound Barrier Install sound absorption panels near the fan.	P0000481	96
Honolulu 8 & Honolulu 9 Emergency Generator Replace the existing 75 KW emergency generator with a new engine-generator.	P0000490	107
Kahe 4 High Pressure Turbine Blades Replace stage blades (approximately 3 rows) of the high pressure turbine.	P0000492	281
Waiau 6 High Pressure Turbine Blades Replace rotating blades (approximately 6 rows) and stationary blades (approximately 22 rows) of the high pressure turbine.	P0000493	2,333
Distributed Control System Processor Replace the existing Westinghouse distributed control system processor.		
Waiau 9 Distributed Control System Processor	P0000564	211
Waiau 10 Distributed Control System Processor	P0000565	211
Waiau 4 Induced Draft High Speed Fan Motor Replace existing motor and feeder cables with a new motor with space heaters and new feeder cables.	P0000583	109
Kahe 3 Turbine Row 9 Rotor Buckets Replace the 9th stage row of rotor buckets of the intermediate pressure turbine.	P0000587	136
Power Plant Security Hardware Install security system hardware at the Honolulu, Waiau and Kahe power plants.	P0000590	263
Kahe 1 Generator Partial Discharge Monitor Install partial discharge monitor complete with portable data logger and software to collect, analyze and store the partial discharge monitor data.	P0000593	131
HECO/Tesoro Oil Pipeline Install approximately 900 feet of pipeline between the Tesoro pipeline and HECO's Barbers Point tank farm.	P0000596	250
Kahe Discharge Structure Reinforce the Kahe Power Plant cooling water discharge structure.	P7060000	4,034

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Main Transformer Fire Sprinkler		
Install fire sprinklers over the main step-up and auxiliary transformers, with detection/alarm system, deluge valve and manual activation.		
Kahe 2 Main Transformer Fire Sprinkler	P9031000	50
Kahe 3 Main Transformer Fire Sprinkler	P9032000	73
Waiau 3 Main Transformer Fire Sprinkler	P9039000	85
Waiau 4 Main Transformer Fire Sprinkler	P9041000	80
Waiau 6 Main Transformer Fire Sprinkler	P9044000	48
Turbine Controls		
Install a microprocessor based turbine control system.		
Kahe 4 Turbine Controls	P9537000	1,018
Kahe 3 Turbine Controls	P9538000	1,015
Waiau 8 Turbine Supervisory Instrument		
Replace the existing turbine vibration system with a new Turbine Supervisory instrument system.		
	P9081000	315
Kahe Caustic Rinse Trailer		
Install system to chemically pre-treat the water used to wash the boiler furnace and air heater elements.		
	P9488000	104
TOTAL PRODUCTION FACILITIES		63,421
<u>TRANSMISSION</u>		
Kahe 1-4 Control House Expansion		
Expand the Kahe 1-4 switching station control house. Upgrade the air conditioning system and lighting system.		
	P7430000	349
Koolau/Wailupe #2 P20 Replacement		
Replace existing wood pole P20 of the Koolau-Wailupe #2 46kV line with a new single steel pole.		
	P0000103	158
Halawa Capacitor Bank Breaker		
Replace the Halawa 46kV capacitor bank breaker with new zero-voltage closing breaker.		
Halawa Capacitor Bank Breaker 4436 Replacement	P0000289	195
Halawa Capacitor Bank Breaker 4492 Replacement	P0000290	195
Pukele Tie Breaker Replacements		
Replace 46kV Breakers 4936 and 4971 at Pukele Substation with new gas circuit breakers.		
	P0000294	139
Pukele Breaker Replacement		
Install new gas circuit breakers at Pukele Substation.		
Pukele Breaker 4814 Replacement	P0000295	161
Pukele Breaker 4815 Replacement	P0000296	171

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
* Ewa Gentry 46kV Relocation Relocate a segment of 46kV overhead subtransmission line in the Ewa Gentry area, east of Fort Weaver Road, between Iroquois Point Road and the Hawaii Prince Golf Course.	P0000435	172
Kahe-Halawa #2 and Waiau-Wahiawa Structure 86/25, 27 Replace the Kahe-Halawa #2/ Waiau-Wahiawa Structure 86/25 and the Waiau-Wahiawa Structure 27 with tubular steel H-frame structures.	P0000491	1,353
Kamehameha Hwy Resurfacing Waiahole-Crouching Lion Relocate approximately 80 poles along Kamehameha Hwy from Waiahole to Crouching Lion.	P0000507	923
Mililani Mauka 46kV Relocation Relocate a portion of HECO's existing Wahiawa-Waimano 46kV overhead line to underground.	P0000588	437
Waialua-Kahuku 46kV Reconductor Reconductor four spans on the existing Waialua-Kahuku 46kV line.	P0000585	203
Waialua-Kahuku 46kV Reconductor 2 Reconductoring of two spans on the existing Waialua-Kahuku 46kV line.	P0000591	81
Archer-Kewalo 138kV Transmission Line (Y46700) Install one 30/50 MVA transformer and 25kV switchgear. Install cable and terminate Archer-Kewalo 138kV line #2 underground circuit. Termination work at Archer Substation and install two 138kV circuit breakers and associated disconnect switches, protective relays, and cable termination for Archer-Kewalo 138kV line #2 underground circuit.		
Archer Substation Termination Line Termination work at Archer Substation including the installation of two 138kV circuit breakers and associated disconnect switches, protective relays, and cable termination for Archer-Kewalo 138 kV Line #2 underground circuit.	P0000151	2,458
Archer-Kewalo 138kV Line #2 Install 138kV cable between Archer and Kewalo Substations.	P0000153	1,342
Kewalo Substation Line #2 Termination work at Kewalo Substation for Archer-Kewalo 138kV Line #2 underground circuit.	P0000154	771
Kewalo-Kamoku 138kV Transmission Line (Y47600) Install cable and terminate Kewalo-Kamoku 138kV line underground circuit. Terminate Archer-Kewalo 138kV line #2 underground circuit at Kewalo Substation.		
Kamoku Substation Transformer Install one 30/50 MVA transformer and 25kV switchgears in Kamoku Substation.	P0000152	2,780
TOTAL TRANSMISSION FACILITIES		11,888

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

**ESTIMATED
TOTAL PROJECT
COST AS OF
10/31/01 (\$000)

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	902
<u>PROGRAMS</u>		
Miscellaneous Communication Facilities-Operational & Control Install minor communication facilities additions.	P1500000	902
Other Miscellaneous Communication Facilities (System Operation Department) Install minor additions to radio and communication facilities, other than those facilities used in direct control of generation, transmission and distribution systems.	P1505000	470
Power Quality Monitor Installation Install power quality monitors in substation transformer switchgears at various distribution substation sites.	P0000089	374
Corrective (Including Emergency) Distribution Overhead Transformer Replacement Replace distribution overhead transformers.	P0000120	547
Corrective (Including Emergency) Distribution Underground Transformer Replacement Replace distribution underground transformers.	P0000121	560
Corrective (Including Emergency) Miscellaneous Distribution & Sub-transmission Cable Failure Replacement Repair distribution primary, secondary, service and sub-transmission underground cables.	P0000122	7,998
Transformer and Equipment Purchases and Service Purchase and service overhead distribution transformers, padmounts including associated switching cabinets, auto-transformers, regulators, small power transformers and padlocks for padmount transformers.	P1680000	20,934
Purchase, Install and Test Meters & Meter Equipment Purchase meters, solid state recorders and associated equipment, instrument transformers, and phase shifting transformers. Test and install this equipment.	P1670000	4,304
Trayer Submersible Switches Replacement Program Replace approximately 30 Trayer submersible switches with an improved corrosion resistant designed switch.	P0000445	436
Minor Distribution Design Underground Additions Install new distribution underground feeder circuits, reconnect existing circuits, and provide for miscellaneous additions.	P1991000	102
Circulating Water Temperature Monitors Install transmitters, cable, and conduit to bring circulating water temperature signals from the existing temperature recorders into the Distributed Control System and Plant Information System of the Kahe, Waiau, and Honolulu steam units.	P0000510	97

FACILITIES OF
HAWAIIAN ELECTRIC COMPANY, INC.

TITLE & DESCRIPTION OF PROJECT	PROJECT NUMBER	**ESTIMATED TOTAL PROJECT COST AS OF 10/31/01 (\$000)
Boiler Feed Pump Automated Test Install thermocouples, pressure transmitters, and voltage transducers on the Kahe, Waiau, and Honolulu steam units.	P0000511	479
TOTAL PROGRAMS		37,203
GRAND TOTAL		149,657

* Projects which have had or may have to be the subject of a public hearing pursuant to HRS Section 269-27.5.

** Information in column labeled "Estimated Total Project Cost" reflects only capital costs. For Programs, the estimate reflects forecast total cost for the period 2001-2005.

*** Functional category for P0000280 & P0000281 is Communication.
Functional category for P0000577 is Transmission.