



**Hawaiian
Electric**

The information found in this document are general guidelines that may be used to aid in the preparation of your service request proposal. Please be advised that depending on the specific needs and actual conditions of your project, Hawaiian Electric may require your design to comply with different specifications including specifications that include more stringent requirements than those included in these design specification guidelines. For further guidance and clarification on the actual specifications that will apply to your particular project, please refer to instructions issued by Hawaiian Electric's Planner or Engineer who is assigned to your particular (Project/Review Request/...). Additionally, please be advised that Hawaiian Electric reserves the right to require additional modifications to any approved design if it is determined during actual construction that additional modifications must be made to address certain field conditions that were not detected or Hawaiian Electric was unaware of during the design review process.



HAWAIIAN ELECTRIC CO., INC.

SPECIFICATION NO. CS7003-36

FOR


CONSTRUCTION OF ELECTRICAL FACILITIES

Prepared by Engineering Department

Rev. 36: 04/01/02
Rev. 35: 08/01/94
Rev. 34: 05/10/93
Rev. 33: 03/31/93
Rev. 32: 10/20/92
Rev. 31: 01/03/92
Rev. 30: 12/03/90
Rev. 29: 11/15/90
Rev. 28: 05/09/90
Rev. 27: 04/16/90
Rev. 26: 02/12/90
Rev. 25: 01/15/90
Rev. 24: 08/14/79
Rev. 23: 09/22/89
Rev. 22: 01/09/89
Rev. 21: 06/14/88
Rev. 20: 03/18/88
Rev. 19: 02/16/88
Rev. 18: 03/31/87
Rev. 17: 05/30/86
Rev. 16: 03/06/86
Rev. 15: 02/24/86
Rev. 14: 02/15/85
Rev. 13: 10/31/84
Rev. 12: 03/27/84
Rev. 11: 11/03/81
Rev. 10: 05/26/80
Rev. 9: 07/10/79
Rev. 8: 03/14/78
Rev. 7: 03/10/77
Rev. 6: 03/08/76
Rev. 5: 01/14/76
Rev. 4: 04/17/74
Rev. 3: 07/25/73
Rev. 2: 01/18/73
Rev. 1: 06/02/72



~~OK~~
F. Karimoto, P.E.
Principal Standards Engineer
Engineering Department



P. Calizar, P.E.
Principal Engineer
Engineering Department

TABLE OF CONTENTS

<u>PART</u>		<u>PAGE</u>
1	GENERAL SPECIFICATIONS.....	1
2	SCOPE OF WORK.....	1
3	LAWS TO BE OBSERVED.....	1
4	EXISTING UTILITIES	1
5	COMPANY FACILITIES	2
6	MATERIALS TO BE FURNISHED BY THE COMPANY AND INSTALLED BY THE CONTRACTOR	4
7	BOARD OF WATER SUPPLY FACILITIES.....	4
8	SEWER AND STORM DRAIN FACILITIES.....	5
9	PROTECTION OF PROPERTY	6
10	PROTECTION OF PEDESTRIANS AND VEHICULAR TRAFFIC.....	6
11	RESTRICTIONS	7
12	RESTORING OF EXISTING FACILITIES AND IMPROVEMENTS.....	8
13	CLEANING AND REMOVAL OF ALL SLIT AND DEBRIS	9
14	NOISE AND DUST CONTROL.....	9
15	PERSONAL SUPERVISION.....	9
16	CHARACTER OF WORKMEN, METHODS AND EQUIPMENT	10
17	PAYMENT	10
18	QUANTITIES AND MEASUREMENTS	11
19	CHANGES IN THE WORK.....	12
20	PAYMENTS DURING PERFORMANCE OF WORK.....	14
21	FINAL INSPECTION - FINAL PAYMENT	14
	APPENDIX A - GAS LINE FACILITIES	15
	APPENDIX B - TELEPHONE FACILITIES	16
	APPENDIX C - AT&T FACILITIES	17
	APPENDIX D - WATER NOTES	18
	APPENDIX E - ELECTRICAL & MAINTENANCE SERVICES DIVISION NOTES.....	20
	APPENDIX F - TRAFFIC NOTES FOR WORK ON CITY & COUNTY STREETS.....	21

PART 1 GENERAL SPECIFICATIONS

The Standard Specifications of General Conditions for Construction of Projects numbered CS7202 shall govern throughout the entire work, except for modifications described herein.

PART 2 SCOPE OF WORK

The Contractor shall furnish all labor, materials, equipment and services necessary and reasonably incidental to complete construction of all electrical facilities in accordance with the drawings and as specified herein.

PART 3 LAWS TO BE OBSERVED

The Contractor is presumed to be familiar with all laws, ordinances and regulations which may in any way affect the equipment or materials used in the proposed construction, those engaged on the work, or the conduct of the work, and shall save the Company harmless against any and all claims arising from violation thereof.

PART 4 EXISTING UTILITIES

- 4.1 Existing utilities are shown on the drawings in approximate locations for the convenience of the Contractor. The fact that any utility is not shown on the drawings shall not relieve the Contractor of his responsibility under this section. It shall be the Contractor's responsibility to ascertain the location of all existing utilities which may be subject to damage by reason of his operations.
- 4.2 The Contractor shall (1) support and protect all utilities during construction, (2) notify immediately any utility of any damage to its system caused by construction under this Contract, and (3) reconstruct, at his expense, damaged portions of the utility system in accordance with the requirements and specifications of the utility concerned.
- 4.3 The drawings will indicate certain utility items to be relocated permanently by the utility owner because of interference with permanent Company facilities to be constructed. The Company shall provide direct payment to the utility owner for this relocation. All other work required for the relocation shall be performed by the Contractor at his expense.

PART 5 COMPANY FACILITIES

- 5.1 The Contractor shall provide the Company with 24 hour access to all existing Company facilities that are to remain, or, for facilities that are to be removed, until they are removed and to all new Company facilities after they are installed. The Contractor shall be held responsible for any delays in Company work due to his failure to provide access to Company facilities.
- 5.2 Electrical equipment or conductors whether electrically energized or not shall remain in place at all times during construction. Handling and moving of electrical equipment or conductors, when required by the Engineer, shall be done by the Company. Work by the Contractor in areas with energized electrical equipment or conductors shall be performed with extreme caution to prevent accidents and to avoid disturbing or damaging this equipment or conductors or any temporary supports or protective guards that are constructed. Unless otherwise permitted by the Company, all work by the Contractor in areas with energized equipment or conductors shall be performed in the presence of a Company inspector and/or standby man. The Contractor shall have the sole responsibility for maintaining safe and efficient working conditions and procedures in these areas.
- 5.3 Any existing or new Company facilities including equipment or conductors damaged by the Contractor during construction shall be replaced by the Company at the Contractor's expense.
- 5.4 Work by the Company
- A. The Contractor shall give the Company two weeks advance notice for any work to be done by the Company on its facilities.
 - B. All temporary relocations of Company facilities at the Contractor's request shall be done at his expense.
 - C. All overtime work done by the Company at the Contractor's request shall be done at his expense.
 - D. Unless otherwise indicated on the drawings or otherwise directed by the Engineer, the Company shall:
 - (1) Remove the concrete envelope from existing underground ducts containing electrical cables.
 - (2) Construct temporary supports and protective barriers for bare ducts and electrical cables immediately after

removal of the concrete envelope is completed. Material for such supports and barriers shall be furnished by the Contractor at no expense to the Company.

- (3) Remove temporary supports and protective barriers constructed under (2) above.
- (4) Remove existing overhead facilities after construction of new underground facilities are completed, new equipment and conductors are installed and energized, and all overhead individual customer services are converted to underground.

5.5 Work by the Contractor

- A. In addition to work indicated on the drawings, or unless otherwise indicated on the drawings or otherwise directed by the Engineer, the Contractor shall:
 - (1) Cut holes in or demolish and remove sections of entire existing structures other than ducts.
 - (2) Perform all work required to enable the Company to safely remove the concrete envelope from existing ducts containing electrical cables. Such work shall include excavation, backfilling, adequate dewatering, sheeting and bracing, demolition, and removal of debris resulting from work by the Company.
 - (3) Remove duct concrete envelope in cases where all cables have been removed by the Company.
 - (4) Provide adequate support and bracing for all existing poles and guys when such facilities are adjacent to areas being excavated.
 - (5) Provide safety precautions for the existing overhead facilities when they become a hazard to pedestrian and vehicular traffic, prior to their removal.

PART 6 MATERIALS TO BE FURNISHED BY THE COMPANY AND INSTALLED BY THE CONTRACTOR

6.1 The Company shall furnish to the Contractor at its Ward Avenue Warehouse the following material if required by the project plans:

- A. All 5/8 ϕ x 8' - 0" copper-clad ground rods.
- B. All Company standard 31-inch manhole frames and covers.

Requisitions for this material shall be furnished to the Contractor by the Engineer.

6.2 Arrangements shall be made in advance with the Stores Division, Ward Avenue Warehouse. The warehouse is open for business from 7:00 a.m. to 3:30 p.m., Monday through Friday, except on Company holidays. The Contractor shall furnish all labor, materials and equipment required to deliver the materials to the job site and to install the materials where required. Company materials lost or damaged by the Contractor shall be replaced in kind by him at his own expense.

PART 7 BOARD OF WATER SUPPLY FACILITIES

7.1 Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the City and County of Honolulu Board of Water Supply's "Water System Standards," Volume 1, dated 1985, and the "Approved Material List and Standard Details for Water System Construction," Volume 2, dated 1985, and all subsequent amendments and additions.

7.2 Deleted.

7.3 Deleted.

7.4 The Contractor shall notify BWS Planning and Engineering Division, Construction Section, one week prior to commencing on the water system.

7.5 Deleted.

- 7.6 The existence and locations of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of work. The Contractor shall be responsible and shall pay for all damages to existing utilities.
- 7.7 All plans by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system, such as lines, grades, fittings, etc., and drainage and other features of improvements shall not be the responsibility of the Board of Water Supply.
- 7.8 The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water line tees and bends wherever there is a possibility of water line movement due to removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measure necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction methods.
- 7.9 Polygon shape for mechanical joint glands as described in AWWA Standard C111 shall be "straight-sided" or an approved equal on a job-to-job basis.
- 7.10 Prior to installation, the Contractor shall submit for approval by the Board of Water Supply, the manufacturer's certification that all cast iron (gray or ductile) fittings for the project conform in all respects to the Water System Standards, dated 1985.

PART 8 SEWER AND STORM DRAIN FACILITIES

- 8.1 All materials and work pertaining to sewer and storm drain system facilities and appurtenances shall be performed in accordance with City Standard Specifications, September 1986, and the Department of Public Works Standard Details, September 1984, current City practices, and the Revised Ordinances of Honolulu, 1978, or the latest revisions of each.
- 8.2 The Contractor shall notify the Division of Wastewater Management and/or Division of Engineering, City and County of Honolulu, seven days prior to commencement of work.

- 8.3 Minimum clearance required between ductlines and storm drains shall be 1 foot when parallel and 6 inches when crossing. For sewers this clearance shall be 2 feet when parallel or when crossing. When sewer clearance is less than 2 feet in crossing ductlines, a concrete jacket shall be poured around the sewer in accordance with City Standards. City Standards shall govern details on Company Drawing No. 30-1030, Specification CS7001, page 21. The Contractor shall notify the Division of Waste Water Management prior to performing this work and submit four (4) sets of approved construction plans.

PART 9 PROTECTION OF PROPERTY

- 9.1 During the construction, the Contractor shall use extreme care to protect all adjacent buildings, driveways, trees, shrubbery, walls, utility lines, etc., and any damage caused by the Contractor shall be immediately remedied and paid for by him.
- 9.2 After the construction, the Contractor shall restore the premises used for his operations to their original condition.
- 9.3 The cost of the work under this section shall not be paid for directly but shall be considered incidental and included in the prices bid for the various items of work.

PART 10 PROTECTION OF PEDESTRIANS AND VEHICULAR TRAFFIC

- 10.1 The Contractor shall, during the progress of work, use proper precautions and methods of procedure and construction for the prevention of accidents and for the protection of persons and property by means of good and sufficient barriers, guards, temporary bridges, detours, notices, lights, warnings, and safeguards; and from sunset until sunrise he shall keep suitable lights burning wherever the public has access near or at any work in progress to define the line of safe passage. He shall indemnify and save harmless the Company against and from all suits, actions, and claims for cost, compensation, damages, or otherwise to which the said Company may be put, on account of the injury or alleged injury to the person or persons or property of another, resulting in any manner whatsoever from the negligence of the Contractor in the performance of the work or in guarding of the same.
- A. Access. During the progress of the work, the Contractor shall provide free access to water meters, water valves, and abutting private property. No material or obstruction of any

sort shall be placed within 25 feet of any fire hydrant. Fire hydrants must be readily accessible to the Fire Department at all times.

- B. Attention is called to private rights-of-way. Driveways shall be kept open and free from obstruction until temporary access driveways satisfactory to the owners are provided for and maintained during construction.
- C. Material excavated during construction shall be placed in such a manner as to economize space and minimum interference with traffic.
- D. The Contractor shall provide, install, and maintain all necessary signs and other protective facilities, which shall conform with the "Hawaii Administration Rules Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" adopted by the Director of Transportation, and the Current U. S. Federal Highway Administration's "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations."
- E. Where pedestrian walkways exist, they shall be maintained in passable condition or other facilities for pedestrian shall be provided. Passage between walkways at intersections shall likewise be provided.

PART 11 RESTRICTIONS

- 11.1 During non-working hours, **the contractor shall install sufficient and safe non-skid steel plates over open trenches and excavations that are subjected to vehicular traffic. The steel plates shall be capable of supporting all types of vehicular traffic and shall be securely anchored with all edges ramped. The contractor shall also install adequate shoring and supports. Open trenches and excavations through pedestrian walkways and sidewalks shall be adequately and securely covered with all weather surfaced plywood and support installed by the contractor. Proper signs, cones, barricades and other devices shall be used to warn traffic and pedestrians of the temporary trench covering.**

- 11.2 No roadway may be closed except with the expressed permission of the Department of Transportation Service. The Contractor shall notify the Honolulu Police Department and the Honolulu Fire Department of the construction work in progress and the blocking or closing of any street or portion thereof.
- 11.3 Work on any City street area may be performed only between the hours of 8:30 a.m. to 3:30 p.m., Monday through Friday, unless otherwise permitted by the Department of Transportation Services.

PART 12 RESTORING OF EXISTING FACILITIES AND IMPROVEMENTS

- 12.1 The Contractor shall restore to a condition as good as it was when he entered upon the work all existing government and private facilities and improvements including pavement, embankment, drainage facilities, sidewalks, curbs, gutters, guard rails, signs, landscaping, grass, etc., disturbed, damaged or removed by him or as a result of his operations.
- 12.2 For work within City right-of-way, the Contractor shall reference, to the approval of the Department of Transportation Services, all existing traffic signs, posts and pavement markings prior to the commencement of construction. The Contractor shall replace or repair all traffic signs, posts, and pavement markings disturbed by his activities. The Contractor shall notify the Department of Transportation Services at 523-4029 one (1) week prior to any work to be done on signs, posts and pavement markings.
- 12.3 All materials and workmanship shall:
 - A. Conform to all applicable laws, ordinances, codes and specifications of any Federal, State and City and County agencies having authority over the work. Contractor shall furnish one-year bond in favor of City and County of Honolulu for restoration work done in City and County streets and highways.
 - B. Conform to the requirements and standards of any private individual, company and corporation having ownership of the work.
 - C. Be subject to inspection and approval by the government agency and private individual, company and corporation concerned.

PART 13 CLEANING AND REMOVAL OF ALL SLIT AND DEBRIS

- 13.1 The Contractor shall be responsible for the cleaning and removal of all slit and debris generated, deposited and accumulated within down stream waterways, ditches, drain pipes and on public roadways.
- 13.2 The Contractor agrees to reimburse the City and County of Honolulu for all costs expended in the performance of the above work if required for public health and safety or made necessary by non-performance by the Contractor.

PART 14 NOISE AND DUST CONTROL

- 14.1 The Contractor shall abate the noise nuisance by special scheduling of noise-producing operations, the use of noiseless equipment, or other means as necessary.
- 14.2 The Contractor shall keep dust in the immediate vicinity of the work to a minimum by sprinkling the area with water as required or by other dust control methods approved by the Engineer. The City shall require supplementary measures as necessary.

PART 15 PERSONAL SUPERVISION

- 15.1 The Contractor shall be present in person, or by a foreman capable of reading and understanding the drawings and specifications. Such person shall have the authority to act for the Contractor in connection with the contract and shall properly supervise and coordinate all work during the performance of the contract.
- 15.2 The Contractor shall file with the Engineer a written statement signed by the Contractor giving the name or names of any and all foremen and employees who are authorized to act in place of the Contractor, and any communication signed in behalf of the Contractor by such agents shall bind the Contractor. The Contractor shall be responsible for notifying the Engineer immediately and in writing of any change in the name or names so submitted.

PART 16 CHARACTER OF WORKMEN, METHODS AND EQUIPMENT

- 16.1 The Contractor shall employ persons who possess the skill required to perform the work under the contract.
- 16.2 When required by the Engineer, the Contractor shall replace any employee who lacks the skill to perform the work assigned to him or is discourteous or disorderly while performing such work. A person who has been replaced may be assigned other work with the approval of the Engineer.
- 16.3 The Contractor shall use proper and efficient methods and equipment for the performance of the contract.

PART 17 PAYMENT

- 17.1 The Contractor shall be paid the contract price as full compensation for the performance of the contract.
- 17.2 For lump sum contracts, the contract price shall be the result obtained by first reducing the amount designated as the total sum bid in the award by the amount included therein for allowances and contingencies, and adding thereto or deducting therefrom any extra cost or any reduction in cost, respectively, to the Company as a result of supplemental agreements in writing and written orders of the Engineer.
- 17.3 For unit price contracts, the contract price shall be the sum of results obtained by multiplying the number of the units of such items incorporated in the work under the contract by the unit price bid therefor. The unit price of an item shall be the amount therefor specified in the Contractor's Bid and shall include its pro rata share of overhead so that the sum of the products obtained by multiplying the quantity shown for each item by the unit price Bid represents the total Bid. Special attention of all Bidders is called to this provision, for should conditions make it necessary to revise the quantities, no limit will be fixed for such increased or decreased quantities nor extra compensation allowed, provided the net monetary value of all such additive and subtractive changes in quantities of such items of work (i.e., difference in cost) shall not increase or decrease the original contract price by more than twenty-five percent (25%).

- 17.4 The contract lump sum price or prices bid for the electrical facilities or the contract unit prices bid per unit for the various electrical facility items shall include full compensation for furnishing all labor, materials, tools and equipment and performing all the work involved in furnishing, installing and constructing all electrical facilities complete in place as shown on drawings and as herein specified.
- 17.5 Full compensation for all additional materials and labor not specifically shown or called for which are necessary to complete all required electrical facilities shall be considered as included in the lump sum or unit prices bid for the various items and no additional allowance will be made therefor.

PART 18 QUANTITIES AND MEASUREMENTS

- 18.1 All quantities of work actually completed in place under the contract shall be measured by the Engineer. These measurements shall be considered correct and final unless the Contractor files a written protest demonstrating the existence of an error within ten (10) calendar days after receipt of such measurement data.
- 18.2 Quantities or measurements indicated in the bid, if any, are given for the convenience of the Contractor. It will be assumed that the lump sum bid and unit prices made by the Contractor and the price agreed upon by him are based on a thorough knowledge of the existing conditions and the amount and kind of work to be performed. It is expressly understood and agreed by the Contractor that quantities and measurements of the work to be done and the materials to be furnished under this contract which have been estimated, as given, are approximate. The Contractor further agrees and hereby understands that neither the Engineer nor the Company is to be held responsible if such estimated quantities and measurements shall not be found to be the same or even close to the actual quantities and measurements required for the work under the contract. The Contractor will make no claim for anticipated profits, or for loss of profits because of a difference between the quantities or measurements stated in the bid. If an error, omission or misstatement shall be discovered in the quantities or measurements stated in the bid, the same shall not vitiate the contract, or release the Contractor or his surety or sureties from performing the contract, or affect the price agreed to under the contract, or excuse the Contractor from any of the obligations or liabilities under the contract, or entitle him to damages or compensation, except as provided herein.

PART 19 CHANGES IN THE WORK

- 19.1 The Company may make changes in the scope of the work required to be performed by the Contractor under the contract or make additions thereto or omit work therefrom, without invalidating the contract, and without relieving or releasing the Contractor from any of his obligations under the contract or any guarantee given by him pursuant to the contract provisions, and without affecting the validity of the guaranty bonds, and without relieving or releasing the surety or sureties of said bonds. All such work shall be executed under the terms of the original contract unless it is expressly provided otherwise.
- 19.2 If applicable unit prices are contained in the Bid, the Company may order the Contractor to proceed with desired changes in the work, the value of such changes to be determined by the measured quantities involved and the applicable unit prices specified in the contract; provided that the net value of all changes does not increase or decrease the original Bid total by more than twenty-five percent (25%).
- 19.3 If applicable unit prices are not contained in the Agreement or if the total net change increases or decreases the total contract price more than twenty-five percent (25%), the Company shall, before ordering the Contractor to proceed with the desired changes, request an itemized proposal from him covering the work involved in the change after which the procedure shall be as follows:
- A. If the proposal is acceptable the Company will prepare the change order in accordance therewith for acceptance by the Contractor, and
 - B. If the proposal is not acceptable and prompt agreement between the two parties cannot be reached, the Company may order the Contractor to proceed with the work on a cost-plus basis as outlined below.
 - (1) Direct labor and supervision per approved time cards based on wage rates previously approved by the Company. Exclude salaries of engineers, project managers, or general supervisory personnel.
 - (2) Direct material and supplies, including freight and handling costs, per approved invoices.
 - (3) Rental costs of equipment, other than small tools, owned by others, per approved invoices based on rental rates previously approved by the Company.

Equipment fully operated and maintained without operator.

- (4) Total of Items (1) through (3).
- (5) Item (4) plus 10% for overhead.
- (6) Payroll insurance, taxes, and fringe benefits for Item (1).
- (7) Premiums on bonds and pro-rata costs of premiums on public liability, property damaged, or other insurance required by the Company.
- (8) Subcontracts approved by the Company.
- (9) Total of Items (5) through (8).
- (10) Item (9) plus 10% for profit.
- (11) Rental costs of equipment, other than small tools, owned by the Contractor, based on rental rates previously approved by the Company. Equipment fully operated and maintained without operator.
- (12) Total of Items (10) and (11).
- (13) State gross income tax on Item (12) less Item (8).
- (14) Total of Items (12) and (13) = Total Cost-Plus Price.

- C. For all cost-plus work, the Contractor shall support invoices for payment with itemized receipted bills for material and subcontract work. The Contractor shall submit a certified copy of payroll covering all labor employed by Contractor and by Subcontractors performing work on a cost-plus basis. Satisfactory evidence shall also be submitted to verify materials drawn from the Contractor's stock, the rental of Contractor's equipment, and other miscellaneous items of cost not otherwise verified.

PART 20 PAYMENTS DURING PERFORMANCE OF WORK

- 20.1 The Engineer shall, not later than the fifteenth (15th) day of each month during the performance of the contract, make an estimate of the amount of work done in accordance with the contract during the immediately preceding month, deducting sufficient allowance for incomplete or unprotected work or to provide for any contingency for defects or damage to said work or for the necessity of performing any part of the work over again to cure defects or damage.

- 20.2 Progress payments to the Contractor shall be for a sum equal to ninety (90) percent of the above estimate, less previous payments and sums withheld by the Company pursuant to the contract.

PART 21 FINAL INSPECTION - FINAL PAYMENT

- 21.1 After completion of the work required under the contract and final acceptance thereof by the Company, the Contractor will be paid the balance due in accordance with the Engineer's final estimate of the construction actually performed, provided that final payment will be made subject to Articles 14 and 16 of the General Conditions.

APPENDIX A

GAS LINE FACILITIES

1. The GASCO, Inc. gas pipe lines in the project area are coated and cathodically protected. The Contractor shall be extremely careful when working near these gas pipe lines.
2. The Contractor shall obtain from GASCO prior written clearance, at least five (5) working days prior to any excavation, and call GASCO, Inc. a minimum of 72 hours before starting excavation to arrange for field location of all existing gas lines.

The Contractor shall excavate and backfill around gas pipe lines in the presence of a GASCO, Inc. representative. All backfill within six inches of gas pipe line shall be of Type B material per HECO, Inc. Specification CS7001, Page 24, D.B. Excavation and Backfill Details.

All excavation within two feet of gas pipe lines shall be done by hand.

3. For relocation of any gas pipe line, the Contractor shall notify GASCO, Inc. five working days before starting work. The Contractor shall provide the necessary excavation and backfill, arrange for traffic permits and restore sidewalk, pavement or other facilities. Any relocation of gas facilities shall be done by GASCO. Hawaiian Electric Company, Inc. shall provide payments to GASCO for relocating the lines which interferes with the Company's permanent facilities.
4. The Contractor shall notify GASCO, Inc. immediately after any damage has been caused to existing gas pipe lines, their coatings or their cathodic protection devices. Repair work on this damage shall be done by GASCO, Inc. with payment for this work to be borne by the Contractor.
5. Minimum clearance required between duct lines and gas pipe lines shall be 12 inches when parallel and/or crossing. Provide adequate support and protection for gas pipe lines exposed in the trench. Such support and protection shall be approved by GASCO, Inc.
6. The Contractor shall work in an expeditious manner in order to keep uncovered gas pipe lines exposed for as short a period of time as possible.

APPENDIX B

TELEPHONE FACILITIES

1. The Contractor shall call Hawaiian Telephone Company 72 hours before starting excavation to arrange for field location of all existing telephone cables and/or duct lines.

The Contractor shall excavate and backfill around telephone cables in the presence of Hawaiian Telephone Company Engineer or his representative. All backfill materials shall be the same as HECO, Inc. Specification CS7001, page 24, D.B. Excavation and Backfill Details.

All excavation within two feet of telephone cables shall be done by hand.

2. For relocation of any telephone cables and/or duct lines, the Contractor shall notify Hawaiian Telephone Company five working days before starting work. The Contractor shall provide the necessary excavation and backfill, arrange for traffic permits and restore sidewalk, pavement or other facilities. The Contractor shall also provide all ducts, pullboxes, handholes, etc., as indicated by Hawaiian Telephone Company. Telephone cables will be relocated by Hawaiian Telephone Company and paid for by the Contractor.
3. The Contractor shall notify Hawaiian Telephone Company immediately after any damage has been caused to existing cables, duct lines, pull boxes, manholes, handholes, poles and guys. Repair work on damaged cables shall be done by Hawaiian Telephone Company and paid for by the Contractor and any other work involving existing underground facilities shall be done by the Contractor in the presence of Hawaiian Telephone Company Engineer or his representative with payment for this work to be borne by the Contractor.
4. Provide adequate support and protection for telephone cables and/or duct lines exposed in the trench. Such support and protection shall be approved by Hawaiian Telephone Company.

APPENDIX C

AT&T FACILITIES

1. The location of AT&T's underground facilities as shown on the plans are from records of varying degrees of accuracy and are not guaranteed as shown. The Contractor shall exercise extreme caution when the excavation and construction crosses or is in close proximity of underground fiber optic cable facilities. Any damage to the existing underground facilities shall be repaired and paid for by the Contractor.
2. When trench excavation is adjacent to or under existing structures or facilities, the Contractor is responsible for properly sheeting and bracing the excavation and stabilizing the existing ground to render it safe and secure from possible slides, cave-ins and settlement, and for properly supporting existing structures and facilities with beams, struts or underpinnings to fully protect it from damage.
3. Any work required to relocate underground facilities shall be done by AT&T Co. and paid for by the Contractor. The Contractor shall be responsible for all coordination.
4. For verifying the location of AT&T's underground facilities call 455-1010.

APPENDIX D

WATER NOTES

1. Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the City and County of Honolulu Board of Water Supply's "Water System Standards," Volume 1, dated 1985, and the "Approved Material List and Standard Details for Water System Construction," Volume 2, dated 1985, the "Water System External Corrosion Control Standards," Volume 3, dated 1991, and all subsequent amendments and additions.
2. The Contractor shall notify BWS Planning and Engineering Division, Construction Section, one week prior to commencing work on the water system.
3. All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system, such as lines, grades, fittings, drainage, etc., and other features of improvements shall not be the responsibility of the Board of Water Supply.
4. The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines tees and bends wherever there is a possibility of water line movement due to removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measure necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction methods.
5. The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy of the encountering of other obstacles during the course of the work. The Contractor shall be responsible and shall pay for all damages to existing utilities. The Contractor shall not assume that where no utilities are shown, that none exist.
6. At the electrical/signal ductline water crossings, adjust all electrical/signal ductline elevation to maintain 6" vertical clear separation from all water lines (12" clear for all electrical/signal ductline structures larger than 16") at no cost to the BWS.
7. Maintain 3'-0" min. horizontal clear separation between all water line systems and nearest electrical/signal ductlines paralleling the water system at no cost to the BWS.

8. Reapproval shall be required if this project is not under construction within a period of two years.
9. The Contractor shall verify all existing service lateral locations whether shown or not shown on plans prior to commencing with any of the work and shall not assume that where no services are shown none exist.

APPENDIX E

ELECTRICAL & MAINTENANCE SERVICES DIVISION NOTES:

1. The Contractor shall notify the Joint Pole Committee two (2) weeks in advance of any relocation of utility pole that may be necessary.
2. The Contractor shall notify the Electrical & Maintenance Services Division, Department of Transportation Services, three (3) working days prior to commencing work on the street lighting system (Telephone: 527-5002).
3. The Contractor shall notify the Electrical & Maintenance Services Division, Department of Transportation Services, three (3) working days prior to commencing work on the traffic signal system (Telephone: 527-5007).
4. The Contractor shall notify the Electrical & Maintenance Services Division, Department of Transportation Services, three (3) working days prior to commencing work on the fiber optic system (Telephone: 527-5007).
5. Street lighting, traffic signal, and fiber optic systems shall be kept operational during construction. Any relocation or changeover required shall be approved by the Electrical & Maintenance Services Division, Department of Transportation Services, and performed and paid for by the Contractor.
6. The Contractor shall be responsible for any damages to existing street lighting, traffic signal, and fiber optic facilities, including the traffic signal interconnect system, and any and all damages to these facilities shall be repaired by the Contractor at his cost in accordance with the requirements of the City and County of Honolulu.

APPENDIX F

TRAFFIC NOTES FOR WORK ON CITY & COUNTY STREETS

1. A permit shall be obtained from the Department of Transportation Services before work on any portion of a public street or highway may begin. Submit a set of approved construction plans when applying for the permit.
2. The Contractor shall provide, install and maintain all necessary signs and other protective facilities, which shall conform with the "Hawaii Administration Rules Governing the Use of Traffic Control Devices at Work Sites on or Adjacent to Public Streets and Highways" adopted by the Director of Transportation, and the current U.S. Federal Highway Administration's "Manual on Uniform Traffic Control Devices for Streets and Highways, Part VI - Traffic Controls for Street and Highway Construction and Maintenance Operations."
3. Work on any city street area may be performed only between the hours of 8:30 a.m. to 3:30 p.m., unless otherwise permitted by the Department of Transportation Services.
4. During non-working hours, all trenches shall be covered with a safe non-skid bridging material, and all lanes shall be opened to traffic.
5. The Contractor shall contact the Department of Transportation Services parking section at 523-4314 at least two (2) working days prior to any parking meter work.
6. As required by the Department of Transportation Services, the Contractor shall provide off-duty police officers to control the flow of traffic.
7. Where pedestrian walkway exist, they shall be maintained in passable condition or other facilities for pedestrians shall be provided. Passage between walkways at intersections shall likewise be provided.
8. Driveways shall be kept open unless the owners of the property using these rights-of-way are otherwise provided for satisfactorily.
9. The Contractor shall reference, to the approval of the Department of Transportation Services, all existing traffic signs, posts and pavement markings prior to the commencement of construction. The Contractor shall replace or repair all traffic signs, posts, and pavement markings disturbed by his activities. The Contractor shall notify the Department of Transportation Services at 523-4029 one (1) week prior to any work to be done on signs, posts and pavement markings.

10. The Contractor shall notify Oahu Transit Services, Lowell Tom (848-4578) or Ed Sniffen (848-4571), two weeks prior to construction, informing them of the location, scope of work, proposed closure of any street or traffic lanes, and the need to relocate any bus stop(s).
11. No material and/or equipment shall be stockpiled or otherwise stored within street rights-of-ways except at locations designated in writing and approved by the Department of Transportation Services.