

WATER SYSTEM STANDARDS



**DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII**



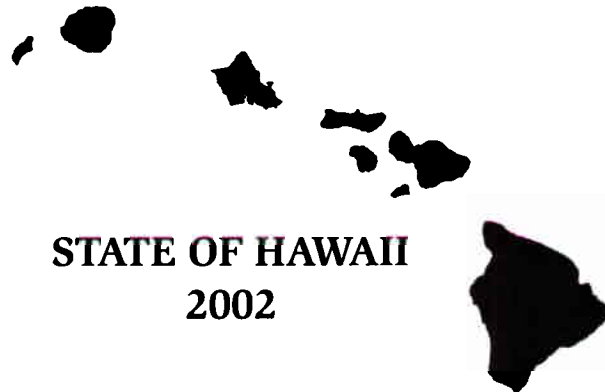
**BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU**



**DEPARTMENT OF WATER
COUNTY OF KAUAI**



**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**



**STATE OF HAWAII
2002**

WATER SYSTEM STANDARDS

PLANNING

MATERIALS

CONSTRUCTION

APPROVED MATERIAL LIST AND STANDARD DETAILS



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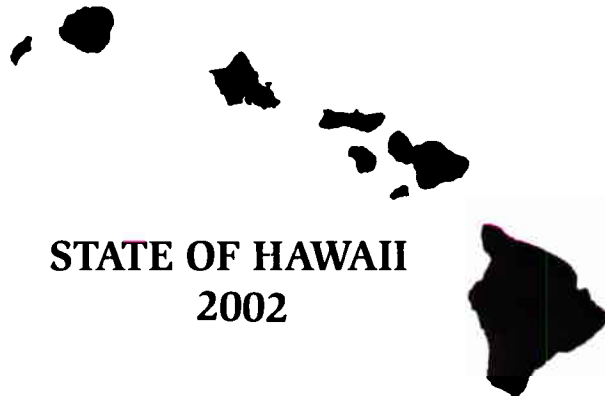
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STATE OF HAWAII
2002

FOREWORD

DEFINITIONS

When used in these standards or elsewhere in the contract, the following terms, or pronouns used in place of them, shall have the meaning ascribed to them in this section, unless it is apparent from the context that a different meaning is intended:

The term Board or Commission shall mean the members of the Board or Commission of Water Supply of the various island water jurisdictions in the State of Hawaii.

The term Contract shall mean the written agreement covering the construction of the project by the Contractor, including the furnishing of labor, materials and equipment in connection therewith. It shall include the notice to contractors, the bid, wage schedule, list of subcontractors, the award, the special provisions, the plans, the specifications, the bond, any addendum and any written order. It shall also include all amendments to the contract by supplemental agreement thereto in writing.

The term Contractor shall mean the party (individual, corporation, joint venture, or partnership) who has entered into the contract with the Department of Water Supply.

The term County shall mean the City and County of Honolulu, County of Hawaii, County of Kauai, or the County of Maui.

The term Engineer shall mean the person or firm who is responsible for the design of the project and who prepared the plans.

The term "Kauai", "Oahu", "Maui", or "Hawaii" shall mean the Department of Water Supply of the respective island water jurisdictions in the State of Hawaii.

The term Mains shall mean water pipelines within the City/County water system, to include Transmission Mains (from its source or storage to the distribution system) and Distribution Mains.

The term Manager shall mean the Manager, Director, or Manager and Chief Engineer of the Department of Water Supply or his authorized representative.

The term Owner or Department shall mean the Department of Water Supply of the various island water jurisdictions in the State of Hawaii.

The term Project shall mean the structure or improvements to be constructed in whole or in part through the performance of this contract.

The term State shall mean the State of Hawaii.

The term Work shall mean all equipment, materials, operations and incidental activities necessary for the completion of any part or all of the project.

SCOPE

This publication shall govern the design and construction of water system facilities under the jurisdiction of the Water Departments of the various counties in the State of Hawaii.

Requirements peculiar to each Department are reflected in these standards by tables and special notes. Also certain features of water system installations which do not readily lend themselves to standardization but are designed and installed according to the special requirements applying to each case shall be subject to special review and approval of the Manager.

Any feature of design, materials to be installed, or construction methods to be used for any installation within the scope of the Water System Standards, but not specifically described herein, shall be of good quality, according to accepted practice, and shall meet with the approval of the Manager.

The Water System Standards are subdivided as follows:

Foreword	
Division 100	Planning
Division 200	Materials
Division 300	Construction
Division 400	Approved Material List and Standard Details
Division 500	Volume 3 External Corrosion Control Standards (Not applicable for Hawaii and Kauai). Refer to the "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991 and all subsequent amendments and additions (under separate cover and not included in these standards)

The "HAWAII ADMINISTRATIVE RULES, TITLE 3", Department of Accounting and General Services, is by reference incorporated herein and made part of these "Water System Standards". The term "HAR" used in these "Water System Standards" refers to the "HAWAII ADMINISTRATIVE RULES, TITLE 3".

For the **Department of Water Supply, County of Hawaii**, the "GENERAL REQUIREMENTS AND COVENANTS FOR THE DEPARTMENT OF WATER SUPPLY, COUNTY OF HAWAII" is by reference incorporated herein and made a part of these "WATER SYSTEM STANDARDS."

For the **Department of Water, County of Kauai**, the "GENERAL PROVISIONS FOR CONSTRUCTION CONTRACTS OF THE DEPARTMENT OF WATER, COUNTY OF KAUAI" is by reference incorporated herein and made a part of these "WATER SYSTEM STANDARDS."

For the **Department of Water Supply, County of Maui**, the "GENERAL CONDITIONS FOR FORMAL CONSTRUCTION BIDS FOR THE COUNTY OF MAUI" is by reference incorporated herein and made a part of these "WATER SYSTEM STANDARDS."

For the **Board of Water Supply, City and County of Honolulu**, the "GENERAL INSTRUCTIONS TO BIDDERS" of the City and County of Honolulu, Department of Budget and Fiscal Services, City and County of Honolulu, revised July 1999, and the "GENERAL CONDITIONS OF CONSTRUCTION CONTRACTS OF THE CITY AND COUNTY OF HONOLULU," Department of Budget and Fiscal Services, revised July 1999, are by reference incorporated herein and made a part of these "WATER SYSTEM STANDARDS".

CONFORMITY AND USE

All design and construction within the scope of the Water System Standards shall be in accordance with the requirements herein, unless specifically modified or required otherwise by the Manager.

Any statement on the plans and specifications requiring materials and construction to be in accordance with the Water System Standards shall have the effect of incorporating all the provisions of the Standards.

AMENDMENTS

The Manager has the authority to make changes to the Water System Standards based on the latest engineering, technology, practices and requirements.

Where official changes, additions, or amendments to the Water System Standards are made, printed copies thereof will be made available to interested parties at the offices of the Water Departments.

Official changes, additions or amendments to the Water System Standards in effect on the date of invitation for bids form a part of the Water System Standards.

REFERENCE SPECIFICATIONS

When reference is made to known standard specifications, the most recently adopted and published edition of such specifications on the date of the notice to bidders is contemplated, unless otherwise specified.

ABBREVIATIONS

The following abbreviations shall refer to the technical society, organization, body, code, rules or standards, listed opposite each abbreviation:

<u>ABBREV.</u>	<u>DESCRIPTION</u>	<u>ABBREV.</u>	<u>DESCRIPTION</u>
AASHTO	American Association of State Highway & Transportation Officials	CIH	Certified Industrial Hygienist
AC	Asphaltic Concrete	CIP	Cast Iron Pipe, Cast-In-Place
ACI	American Concrete Institute	CC	Compression Coupling
Ag	Gross Area	CCP	Concrete Cylinder Pipe
AG	Air Gap	CIRC	Circular
AISC	American Institute of Steel Construction	CL	Class
ANSI	American National Standards Institute	CLR	Clearance, Clear
ARV	Air Relief Valve	CMU	Concrete Masonry Unit
As	Area of Steel	COMP FLG	Companion Flange
ASTM	American Society for Testing & Materials	COMP METER	Compound Meter
AWWA	American Water Works Association	CONC	Concrete
AWS	American Welding Society	CONC BLK.	Concrete Block
B	Bell End	CONT	Continuous
B&S	Bell & Spigot	DI	Ductile Iron
BWG	Birmingham Wire	DC BFP	Double Check Backflow Preventer
BFP	Backflow Preventer	DC	Detector Check Meter
BFV	Butterfly Valve	METER	
BGGV	Bevel Geared Gate Valve	DCV	Double Check Valve
BOT	Bottom	DFT	Dry Film Thickness
BV	Butterfly Valve	DIA	Diameter
BW	Both Ways	DIAG	Diagonal
BWS	Board of Water Supply	DLNR	Department of Land and Natural Resources
C X C	Copper to Copper	DOT	Department of Transportation
CI	Cast Iron	DPP	Department of Planning and Permitting

<u>ABBREV.</u>	<u>DESCRIPTION</u>	<u>ABBREV.</u>	<u>DESCRIPTION</u>
DPW	Standard Details and Standard Specification for Public Works Construction, Department of Public Works, Kauai, Hawaii, Maui, Oahu	GA	Gauge, Gage
		GALS	Gallons
		GALV	Galvanized
		GPM	Gallons Per Minute
DR	Diameter to Thickness Ratio, Wall Thickness Dimension Ratio	GV	Gate Valve
		HAR	Hawaii Administrative Rules, Title 3
DWS	Department of Water Supply	HCB	Hollow Core Block
EA	Each	HORIZ	Horizontal
EF	Each Face	HR	Hour
EPA	Environmental Protection Agency	HRS	Hawaii Revised Statutes
EQ	Equal	HS	Highway Standard
ES	Each Side	HT	Height
EW	Each Way	ID	Inside Diameter
F	Flanged	ID	Identification
FB	Flat Bar	IN	Inch
FCCCHR/ USC	Foundation for Cross-Connection Control and Hydraulic Research/University of Southern California	LF	Linear Feet
FE	Flanged End	LBS	Pounds
FDA	Food and Drug Administration	LG	Long
FE X MJ	Flanged End by Mechanical Joint	LRFD	Load and Resistance Factor Design
FH	Fire Hydrant	MJ	Mechanical Joint
FIN GR	Finished Grade	MAX	Maximum
FIPT	Female Iron Pipe Thread	MGD	Million Gallons Per Day
FL	Flanged	MH	Manhole
FE x B	Flanged by Bell End Pipe	MIL	Millimeter
FPT	Female Pipe Thread	MIN	Minimum
FS	Federal Specifications	MIPT	Male Iron Pipe Thread
FT	Foot	MPT	Male Pipe Thread
FTG	Footing	MTD	Mounted
GI	Galvanized Iron	NPTE	National Pipe Thread, External
		NPTI	National Pipe Thread, Internal
		N/A	Not Applicable

<u>ABBREV.</u>	<u>DESCRIPTION</u>	<u>ABBREV.</u>	<u>DESCRIPTION</u>
NA	Not Allowed	REQ'D	Required
NEC	National Electric Code	RO	Revised Ordinances, City and County of Honolulu
NEMA	National Electrical Manufacturer's Association	RP	Reduced Pressure Backflow Preventer
NO	Number	SE	Screwed End
NPDES	National Pollutant Discharge Elimination System	SJ	Slip Joint
NRS	Non Rising Stem	SP	Special Provision
NSF	National Sanitation Foundation	SQ	Square
NTS	Not To Scale	SS	Stainless Steel
OC	On Center	STD	Standard
OCEW	On Center Each Way	STL	Steel
OD	Outside Diameter	T & B	Top & Bottom
OS & Y	Operating Stem & Yoke	THK	Thick
OSHA	Occupational Safety and Health Act	TV	Top Vertical
OZ	Ounce, Ounces	TYP	Typical
PC	Point of Curvature	UBC	Uniform Building Code
PJ	Pack Joint	UL	Underwriters' Laboratories, Inc.
PL	Property Line	USG	U. S. Standard Gage
PT	Point of Tangency	USGS	U. S. Geological Survey
PCF	Pounds Per Cubic Foot	VB	Vacuum Breaker (atmospheric or pressure type)
PE	Plain End	VERT	Vertical
PE	Polyethylene	VOL	Volume
PE X FE	Plain End by Flanged End	W/	With
PLT	Plate	W/O	Without
PSF	Pounds Per Square Foot	WF	Wide Flange
PSI	Pounds Per Square Inch	WT	Watertable
PVC	Polyvinyl Chloride	WWF	Welded Wire Fabric
R/W	Right-of-Way		
RAD	Radius		
RED	Reducer		
REINF	Reinforce, Reinforcing, Reinforcement		

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Not applicable for Hawaii and Kauai: Refer to the “WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS”, VOLUME 3, DATED 1991 and all subsequent amendments and additions (under separate cover and not included in these Standards).

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