

ORIGINAL

Decision No. 53204

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Investigation on)
the Commission's own motion to consider)
the adoption of Service Standards and)
Service Rules for water utilities under)
its jurisdiction.)

Case No. 5663

Appearances are listed at end of order.

O P I N I O N

This Commission, by an investigation order issued on its own motion and filed July 18, 1955, initiated this proceeding for the purpose of adopting and prescribing, by general order, uniform service standards and service rules applicable to all privately-owned, public utility water companies in the State of California.

Initial hearings, for the purpose of receiving and considering rules governing water service, including minimum standards for design and construction, proposed by the Commission's staff engineers, were held, after widespread notice, at San Francisco on August 31, 1955, and at Los Angeles on September 7, 1955, before Commissioner Rex Hardy and Examiner John M. Gregory.

Following the initial hearings, a Committee on Service Rules and Standards of the California Section, American Water Works Association, assisted by an advisory committee of the Water and Sewage Works Manufacturers Association, Inc., undertook a study of the staff's proposals and the preparation of a report embracing minimum rules and standards considered practicable by the water works

¹ The staff's proposals were sponsored by John D. Reader, an engineer of the Commission's Hydraulic Section.

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industry.

The Committee, after approximately seven months' effort on the part of its members, which included reconciliation of divergent views held by various segments of the waterworks industry as well as the resolution of problems presented by representatives of certain telephone utilities facilities of which might be in physical contact with water pipe lines, completed its initial report about March 1, 1956. Conferences were then held with the Commission's staff for the purpose of considering and reconciling, where possible, the respective needs and proposals of the waterworks industry and the Commission's staff in order that a workable set of rules might be formulated that would give due recognition both to the operating problems of the utilities and the regulatory problems of the Commission, and which, at the same time, would not result in the imposition of unreasonable financial burdens on the water utilities.

The final proposals of the Committee that emerged from the extended discussions and conferences previously mentioned were incorporated in a report which was forwarded by the Committee to the Commission on April 5, 1956. The report was also mailed to all members of the Executive Committee of the California Section of the

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The Committee on Service Rules and Standards, headed by W. C. Welmon, Secretary and Treasurer of Southern California Water Company, comprised 36 experienced representatives of large and small water companies. It included representatives of municipally-owned systems as well as the privately-owned utilities. The Committee was divided into three general groups: (1) Rules and Regulations, headed by Fred L. Dodge of California Water Service Company; (2) Engineering and Construction, headed by John N. Spaulding of Pacific Gas and Electric Company (with three sub-groups: Sanitation and Public Health, headed by Henry C. Myers of California Water and Telephone Company; Engineering Design and Construction, of which John C. Luthin, of Suburban Water Systems, was chairman; Materials and Specifications, chaired by Everett L. Clark, Consulting Engineer); (3) Meters and Metering, headed by C. L. Stuart of Southern California Water Company

American Water Works Association, to all members of the Committee on Rules and Standards and its advisory committee of the Water and Sewage Works Manufacturers' Association, and to the Secretary of the American Water Works Association. The report, with minor revisions agreed to by the Committee's representatives and the Commission's staff, was received in evidence as Exhibit 7 at the concluding hearings held at San Francisco on April 30, 1956, and at Los Angeles on May 14, 1956.

The rules embodied in this report have been given careful consideration by the Commission. This is the type of regulatory undertaking in which the cooperative efforts of experts working in and fully familiar with the problems of the industry, and staff experts equally familiar with the regulatory problems of the Commission and the interests of the consumers, can be most effectively employed. The proposed rules, emerging from this cooperative process in the present instance have for their purpose the promotion of good water utility practices, the encouragement of efficiency and economy, and the establishment of minimum standards to be hereafter observed in the design, construction and operation of waterworks facilities by water utilities operating under the jurisdiction of this Commission.

Though designed primarily for utility systems supplying potable water under pressure, the rules are also intended, where applicable, for the governance of utilities supplying non-potable water from ditches, canals or other conduits.

It is not the purpose or intent of these rules automatically to supersede the rules, charges or practices contained in the tariff schedules of the various water utilities as filed with this Commission

under the provisions of General Order No. 96.³ Rather, they are intended as basic rules to govern water utilities in their dealings with the Commission and in the operation and replacement of facilities for water service in conformance with good public utility practices, together with minimum standards to be considered in the design and construction of water systems.

Certain provisions of the rules herein adopted, however, may be in conflict with related provisions incorporated in the tariff schedules filed by each of the water utilities; as an example, the provision for increased charges for reconnection of service as set forth in paragraph 6f of the first, or "General," section of the rules herein being adopted. A utility may revise, in a manner satisfactory to the Commission and in conformity with the provisions of General Order No. 96, its rules governing relations with its customers, in effect and on file with this Commission as a part of its tariff schedules, in those instances where said presently effective rules provide for less restrictive conditions or lesser charges than those permitted by the general order hereinafter adopted.

On consideration of the record herein, we find that the public interest will be served by the establishment of reasonable rules governing water service, including minimum standards of design and construction, applicable to all privately-owned water utilities in their dealings with the Commission. We further find that the rules incorporated in Exhibit 7, in evidence in this proceeding, are reasonable. Those rules, accordingly, should and will be adopted

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General Order No. 96 provides rules governing the filing and posting of schedules of rates, rules, regulations, and contracts relating to rates, applicable to water utilities and to other utilities specified in that general order.

and established, as a general order of the Commission, for observance by all water utilities in this state which are, or may become, subject to the jurisdiction of this Commission. Should the prescription of said general order result in any increases in rates or charges, or in more restrictive practices, we hereby find such increases or restrictive practices to be justified.

O R D E R

Public hearings having been held in the above-entitled and numbered proceeding, evidence having been received and considered, the matter having been submitted for decision, the Commission now being fully advised and basing its order upon the findings and conclusions contained in the foregoing opinion,

IT IS ORDERED that:

(1) General Order No. 103 is hereby adopted and established to read as shown in Appendix "A", attached to this order and by reference made a part hereof, to be effective on and after July 1, 1956.

(2) The Commission's investigation herein, Case No. 5663, be and it hereby is discontinued.

The effective date of this decision and order shall be ten days after the date hereof, at which time all other conflicting orders of this Commission shall be thereby revoked and of no further force or effect.

Dated at San Francisco, California, this 12th day of June, 1956.

[Signature]
President
[Signature]
[Signature]
[Signature]
Commissioners

LIST OF APPEARANCES

Mary Moran Pajalich, Senior Counsel, Frank F. Watters, Hydraulic Engineer, and Charles W. Drake, Senior Utilities Engineer, for Public Utilities Commission staff.

Florence Fetherston, for Felton Water Company; Fred L. Dodge, for California Water Service Company; Philip F. Walsh, for Southern California Water Company; F. T. Searls and John C. Morrissey, by John C. Morrissey, for Pacific Gas and Electric Company; W. C. Welmon, William R. Seeger and L. J. Alexander, for California Section of the American Water Works Association; Patrick J. Maloney, for Carpinteria Water Company; John C. Luthin, for Suburban Water Systems; George A. Olson, for American Molding Company; Roy E. Theiss, for American Brass and Iron Foundry, Plastics Division; T. H. Underwood, for Citizens Utilities Company of California; Charles B. Parbury, for San Jose Water Works; Robert C. Raab, for Jordan Rogers Company; Everett L. Clark, for Pacific Water Company, and with E. E. Pedder, for Conservative Water Company; J. E. Skelton, for San Gabriel Valley Water Company and California Water Association; W. E. Rodes and C. David Herlihy, for American Pipe and Construction Company; Carl L. Damsen, for Berrysen Water Company; Mrs. W. H. Dobrenzsky, for Newman Water Works Company; Leo Grant Farr, for California State Department of Public Health, Bureau of Sanitary Engineering, Berkeley; Arthur T. George, Dexter C. Tight, Pillsbury, Madison and Sutro, by Dexter C. Tight, for The Pacific Telephone and Telegraph Company; J. J. Deuel, for California Farm Bureau Federation; George W. Hasek, for Hacienda Water Company; W. J. Hays and Claude N. Rosenberg, for California Water and Telephone Company; Susie Donaghy, for Donaghy Water Company; Weber D. Rothwell, County Engineer's Office, for County of Sacramento; L. T. Hollopeter, for Lakewood Water and Power Company; McCutchen, Thomas, Matthew, Griffiths and Greene, by Robert Edmondson and Burnham Enersen, for Buena Vista Canal, Inc., Eastside Canal Company, the Farmers Canal Company, Kern Island Canal Company, Kern River Canal and Irrigating Company and Stine Canal, Inc.; Scott Elder, for Pinewood Water Company; Robert Pokorny and Victor J. Delabar, Department of Public Works, Bureau of Building Inspection, Electrical Inspection, for City and County of San Francisco; T. E. Finger, for Lake Forest Water Company; Ben M. Boyden, Assistant City Engineer, for City of Stockton; Lloyd O. Leslie, for Federal Housing Administration; Kennan H. Beard, for Del Este Water Company; L. R. Vanoni, for Coast Springs Water Company; Gail Bash, for Ben Ali Water Company; W. L. Arnold, in propria persona; J. P. Bradley, T. V. Tallon, George W. Smith and Alex. Lawrence for Dominguez Water Corporation; C. M. Brewer, for Corona City Water Company; R. A. Campbell, for City of San Diego; William T. Cruse, for Society of the Plastics Industry; John A. Cunningham, for Sunny Slope Heights Water Company and Mission Water

LIST OF APPEARANCES (Cont'd.)

Company; Robert O. Curran, City Attorney, for National City; Ray F. Finlay, for American Plastic Pipe Corporation; V. M. Freeman, for Santa Paula Water Works, Ltd. and Farmers Irrigation Company; John C. Hayes, for City of Arcadia; William A. Howell, Jr. and B. Rintoul, for Western Water Company; Henry E. Jordan, Chief Engineer, Section of Bureau of Franchises and Public Utilities, for City of Long Beach; George A. Kendall, for Palos Verdes Water Company; Anson H. Phillips, for Malibu Water Company; H. Arthur Price, Senior Design Engineer, Department of Water and Power of the City of Los Angeles, for American Water Works Association, California Section, Committee on Standards, and for Committee E7A of A.W.W.A. on Steel Pipe and Protective Coatings; J. A. Olsson, for C. Leland Gunn, City Manager, City of Bakersfield; W. R. Quinney, for Central Gardens Water Company; William D. Seymour, for Amercoat Corporation; M. J. Shelton, General Manager and Chief Engineer, for La Mesa, Lemon Grove and Spring Valley Irrigation District; Hayman W. Stokes, for Inglewood City Water Department and A.W.W.A. Committee on Standards, California Section; F. H. Uehling, for Uehling Water Company; Robert Minge Brown, for Rules and Standards Committee of California Section of American Water Works Association; Arthur W. Nicholls, for Dutch Flat Water Works; Delbert H. Hansen, for Electrical Inspectors, City of Oakland; James F. Wilson, for Ventura Water Company.

APPENDIX "A"

GENERAL ORDER NO. 103

RULES GOVERNING WATER SERVICE

INCLUDING

MINIMUM STANDARDS FOR DESIGN AND CONSTRUCTION

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I. General

1. Intent.

a. Purpose. The purpose of these rules is to promote good public utility practices, to encourage efficiency and economy and to establish minimum standards to be hereafter observed in the design, construction and operation of waterworks facilities by water utilities operating under the jurisdiction of the Commission. The standards herein prescribed are intended as minimum standards applicable after adoption and continued full utilization of existing facilities is contemplated. Nothing contained in any of the rules herein promulgated shall be construed to require the replacement or abandonment prior to the expiration of economic utilization of facilities in use at the time of adoption of these rules unless the Commission, after hearing, shall enter an order directing the abandonment or replacement of particular facilities found to be inadequate for the rendition of proper public utility service.

b. Absence of Civil Liability. These rules are adopted by the Commission to establish minimum standards in relation to the design, construction and operation of waterworks facilities by water utilities operating under the jurisdiction of the Commission. Such establishment shall not impose upon these utilities, and they shall not be subject to, any civil liability for damages, which liability would not exist at law if these rules had not been adopted.

2. Applicability. These rules are designed primarily for utility systems supplying potable water under pressure but shall apply insofar as they may be appropriate to utility systems supplying water not intended or claimed to be potable from ditches, canals or other conduits. The paragraphs of these rules applicable to utility systems supplying such non-potable water are set forth in Appendix A hereto.

3. Definitions.

a. Commission. In the interpretation of these rules the word "Commission" shall be construed to mean the Public Utilities Commission of the State of California.

b. Utility. Any person, firm, or corporation, their lessees, trustees, receivers or trustees appointed by any court whatsoever, owning, controlling, operating, or managing any water system within this State, who sells, leases, rents, or delivers water to any person, firm, corporation, municipality, or any other political subdivision of the State, whether under contract or otherwise, is a public utility, except as provided in Sections 2704, 2705 and 2706 of the Public Utilities Code.

c. Customer. The word "customer" shall be construed to mean any person, firm, association, corporation or governmental agency supplied or entitled to be supplied with water service for compensation by a utility.

d. Meter. The word "meter" shall be construed to mean any device used for the purpose of measuring the quantity of water delivered by a utility to a customer.

e. Service Pipe. The term "service pipe" shall be construed to mean the connection between the utility's mains and the service connection and shall include all of the pipe, fittings and valves necessary to make the connection.

f. Service Connection. The term "service connection" shall be construed to mean the point of connection of the customer's piping or ditch with the meter, service pipe or ditch owned by the utility.

4. Information Available to Public. The utility shall maintain, open for public inspection, at its more important commercial offices pertinent information regarding the service rendered including the following:

a. Characteristics of Water. A description in writing of the kind of water to be furnished, whether filtered or unfiltered and whether treated or untreated and the extent thereof.

b. Rates and Rules. A copy of the tariff schedules consisting of rates, general rules of the utility, service area maps and forms of contracts and applications applicable to the territory served from that office.

c. Reading Meters. Information about method of reading meters.

d. Bill Analysis. A statement of the past readings of the meter or meters serving a customer's own premises for a period of two years.

5. Access to Property. The utility shall at all reasonable hours have access to meters, service connections and other property owned by it which may be located on customer's premises for purposes of installation, maintenance, operation or removal of its property at the time service is to be terminated. The customer's system should be open for inspection at all reasonable times to authorized representatives of the utility. Any employee of the utility whose duties require him to enter the customer's premises shall wear a distinguishing uniform or other insignia, identifying him as an employee of the utility, or carry on his person a badge or other identification which will identify him as an employee of the utility, the same to be shown by him upon request.

6. Discontinuance of Service.

a. For Noncompliance with Rules. No utility shall discontinue service to any customer for violation of its rules without first having diligently tried to induce the customer to comply with its rules on file with the Commission. After such effort on the part of the utility, service may be discontinued after the utility has given the customer at least five days' written notice of such intention either by mail or by leaving such notice in a conspicuous place at the customer's premises. Where safety of water supply is endangered, service may be discontinued immediately without notice.

b. For Nonpayment of Bills. No utility shall discontinue service to any customer for nonpayment of bills (including delayed payment charges) without first having diligently tried to induce the customer to pay same. After such effort on the part of the utility, service may be discontinued after the utility has given the customer at least five days' written notice of such intention in the manner provided in the preceding paragraph.

c. For Unsafe Apparatus or Where Service is Detrimental or Damaging to the Utility or Its Customers. If an unsafe or hazardous condition is found to exist on the customer's premises, or if the use of water thereon by apparatus, appliances, equipment or otherwise is found to be detrimental or damaging to the utility or its customers, the service may be shut off without notice, provided that the utility shall notify the customer immediately of the reasons for the discontinuance and the corrective action to be taken by the customer before service can be restored.

d. For Fraudulent Use of Service. When the utility has discovered that a customer has obtained water service by fraudulent means, or has diverted the water service for unauthorized use, the service to that customer may be discontinued without notice. The utility shall not be required to restore service until the customer has complied with all filed rules and reasonable requirements of the utility and the utility has been reimbursed for the full amount of the service rendered and the actual cost to the utility incurred by reason of the fraudulent use.

e. Reconnection. In all cases of discontinuance of service as herein defined, and after the cause for discontinuance has been corrected, and all rules of the utility on file with the Commission have been complied with, the utility shall, without unreasonable delay, restore service to the customer.

f. Charge for Reconnection. Where service has been discontinued for violation of rules or for nonpayment of bills, the utility may charge \$2.50 for reconnection of service during regular working hours or \$5.00 for reconnection of service at other than regular working hours when the customer has requested that the reconnection be made at other than regular working hours.

7. Refusal to Serve.

a. Conditions for Refusal. The utility may refuse to serve an applicant for service under the following conditions:

(1) If the applicant fails to comply with the rules of the utility as filed with the Commission.

(2) If the intended use of the service is of such a nature that it will be detrimental or injurious to the service furnished to existing customers.

(3) If, in the judgment of the utility, the applicant's installation for utilizing the service is unsafe or hazardous, or of such a nature that satisfactory service cannot be rendered.

(4) Where service has been discontinued for fraudulent use, it shall be the duty of the utility before making service connections to a new customer to ascertain that prior fraudulent use of the facilities will not be attributed to the new customer. Where service has been discontinued for fraudulent use, the utility shall not be required to serve an applicant until the utility has determined that all conditions of fraudulent use or practice have been corrected.

b. Notification to Customers. When an applicant is refused service under the provisions of this rule, the utility shall notify him promptly of the reason for the refusal to serve and of his right to appeal the utility's decision to the Commission.

8. Complaints. Upon complaint to the utility by a customer either at its office, by letter or by telephone, the utility shall promptly make a suitable investigation and advise the complainant of the results thereof. It shall keep a record of all complaints which shall show the name and address of the complainant, the date and nature of the complaint, and the adjustment or disposition thereof for a period of two years subsequent to the final settlement of the complaint. After two years the utility shall keep at its option either the original complaints or a summary of such complaints for an additional three years. Complaints with reference to rates or charges which require no further action by the utility need not be recorded.

9. Accidents. The utility shall cooperate with the Commission to promote a reduction in hazards within the industry and to the public. The utility shall keep a record of any accident endangering the public in general, or its employees, or disrupting the facilities for supplying water to the public which may have caused substantial property damage, serious personal injury or death, which shall be available for inspection by the Commission for the period prescribed by the California Code of Civil Procedure for the commencement of actions thereon but in no instance less than five years. The utility shall assist the Commission in the event of an investigation by the Commission staff.

10. Records and Reports.

a. System Maps. Each utility shall have on file at its principal office located within the state, drawings, maps or other permanent records for the purpose of aiding in the operation of the water system. The scale of such maps or drawings shall be such that all data recorded thereon shall be clear

and legible. These records, unless the Commission otherwise authorizes, shall show the following:

(1) Location of all principal pumping stations, diversion works, water treatment and filter plants, sources of supply, storage facilities, size, character, and location of all mains and ditches, including valves and gates, gauges, interconnections with other systems and fire hydrants.

(2) Location, size and kind of each service pipe.

(3) Layout of all principal pumping stations, water treatment and filter plants to show size, location and character of all major equipment, pipelines, connections, valves and other equipment used in connection therewith.

(4) The date of construction of all principal items of plant and extensions of main.

b. Location of Records. All records required by these rules shall be kept at the principal office of the utility or other suitable storage place located within the state and shall be made available to representatives, agents or employees of the Commission upon reasonable notice and at all reasonable hours.

Reports to the Commission. The utility shall furnish to the Commission, at such times and in such form as the Commission may require, the results or summaries of any tests required by these rules. The utility shall also furnish the Commission with any information concerning the utility's facilities or operations which the Commission may request and need for determining rates or judging the practices of the utility.

11. Deviations from Any of These Rules. In those cases where the application of any of the rules incorporated herein results in undue hardship or expense to the utility, it may request specific relief by filing a formal application in accordance with the Commission's Rules of Procedure, except that where the relief to be requested is of minor importance or temporary in nature, the Commission may accept an application and showing of necessity by letter.

II. Standards of Service

1. Quality of Water.

a. General. Any utility serving water for human consumption or for domestic uses shall provide water that is wholesome, potable, in no way harmful or dangerous to health and, insofar as practicable, free from objectionable odors, taste, color and turbidity. Any utility supplying water for human consumption shall hold or make application for a permit as provided by the Health and Safety Code of the State of California, and shall comply with the laws and regulations of the state or local Department of Public Health. It is not intended that any rule contained in this paragraph II 1 shall supersede or conflict with an applicable regulation of the State Department of Public Health. A compliance by a utility with the regulations of the State Department of Public Health on a particular subject matter shall constitute a compliance with such of these rules as relate to the same subject matter except as otherwise ordered by the Commission.

b. Water Supply. In the absence of comparable requirements of the State Department of Public Health, the following general rules shall apply:

(1) Source. Water supplied by any utility shall be:

(a) Obtained from a source free from pollution; or obtained from a source adequately purified by natural agencies; or adequately protected by artificial treatment.

(b) From a source reasonably adequate to provide a continuous supply of water.

(c) Of such quality as to meet the United States Public Health Service Drinking Water Standards of 1946.

(2) Operation of Supply System.

(a) The water supply system, including wells, reservoirs, pumping equipment, treatment and filtration works, mains, meters and service pipes shall be free from sanitary defects.

(b) No physical connection between the distribution system of a public potable water supply and that of any other water supply shall be permitted except in compliance with the Regulations Relating to Cross-Connections of the State Department of Public Health contained in Title 17 of the California Administrative Code.

(c) The presence of algae, crenothrix and other growths in the water shall be controlled by proper treatment.

c. Testing of Water.

(1) Test. Each utility shall have representative samples of the water supplied by it examined by the state or local Department of Public Health or by an approved water laboratory as defined in Title 17 of the California Administrative Code, at intervals specified by the state or local Department of Public Health, in accordance with the United States Public Health Service Drinking Water Standards of 1946.

(2) Reports of Tests. The Commission shall be promptly notified in writing by the utility and supplied with a preliminary report describing the situation when matters of water quality are under review by the state or local Health Department as a result of not meeting the United States Public Health Service Drinking Water Standards of 1946. A final report shall be submitted to the Commission within a reasonable time after final disposition of the matter.

2. Continuity of Service.

a. Emergency Interruptions. Each utility shall make all reasonable efforts to prevent interruptions to service and when such interruptions occur shall endeavor to reestablish service with the shortest possible delay consistent with the safety to its customers and the general public. Where an emergency interruption of service affects the service to any public fire protection device, the utility shall promptly endeavor to notify the Fire Chief or other public official responsible for fire protection of such interruption and of subsequent restoration of normal service.

b. Scheduled Interruptions. Whenever any utility finds it necessary to schedule an interruption to its service, it shall, where feasible, notify all customers to be affected by the interruption, stating the approximate time and anticipated duration of the interruption. Scheduled interruptions shall be made at such hours as will provide least inconvenience to the customers consistent with reasonable operations. Where public fire protection is provided by the mains affected by the interruptions, the utility shall promptly endeavor to notify the Fire Chief or other officials responsible for fire protection, stating the approximate time and anticipated duration. In addition, the Fire Chief or other official responsible for fire protection shall be notified promptly upon restoration of service.

c. Record of Interruptions. Each utility shall keep a complete record of all major interruptions, both emergency and scheduled. This record shall show the cause for interruption, date, time, duration, location, approximate number of customers affected and, in cases of emergency interruptions, the remedy and steps taken to prevent recurrence.

d. Reports to Commission. All emergency interruptions involving an entire system, an entire separately operated system of a multi-system utility or a major portion of an entire or separately operated system shall be reported to the Commission by the utility as soon as possible after occurrence by telephone or telegraph stating the cause, date, time, estimated duration, location, approximate number of customers affected and remedial steps being taken to restore service. Written reports thereof shall be submitted to the Commission within 48 hours after restoration of service giving the information outlined in subparagraph c above, together with such other data as may be appropriate under the circumstances.

3. Pressures.

a. Variations in Pressure. The utility shall maintain normal operating pressures of not less than 25 p.s.i.g. nor more than 125 p.s.i.g. at the service connection, except that during periods of hourly maximum demand the pressure at the time of peak seasonal loads may be not less than 20 p.s.i.g. and that during periods of hourly minimum demand the pressure may be not more than 150 p.s.i.g. Variations in pressures under normal operation shall not exceed 50% of the average operating pressure. The average operating pressure shall be determined by computing the arithmetical average of at least 24 consecutive hourly pressure readings. In the interpretation of this rule it shall be understood that in systems of widely varying elevations a utility may

undertake to furnish a service which does not comply with the foregoing specifications if the customer is fully advised of the conditions under which average service may be expected, and the customer's agreement secured in writing. It shall be understood that this waiver shall not deny the right of the customer to request a service more nearly comparable to that furnished to the balance of the system, nor the Commission's right to require a better service when, upon investigation, it appears right and proper that such betterments should be made.

b. Pressure Gauges. Each utility shall provide itself with one or more recording pressure gauges for each separately operated system for the purpose of making pressure surveys as required by these rules. These gauges shall be able to record the pressure experienced on such system and shall be able to record a continuous 24-hour test. Each utility serving 1,000 or more customers in a separately operated system or 1,000 or more customers in any separately operated system of a multi-system utility shall maintain one or more of these recording pressure gauges in service at some representative point or points on the utility's system.

c. Pressure Surveys. At regular intervals, but not less than once each year, each utility shall make a survey of pressures in its distribution system of sufficient magnitude to indicate the pressures maintained at representative points on its system. Such surveys should be made at or near the period of maximum usage. The pressure charts for these surveys shall show the date and time of beginning and end of the test and the location at which the test was made. Records of these pressure surveys shall be maintained by the utility for a period of at least three years and shall be made available to representatives, agents or employees of the Commission upon request.

4. Water Supply Measurement.

a. Measuring Devices. Each utility shall install a suitable measuring device, or otherwise determine production, at each source of supply in order that a record may be maintained of the quantity of water produced by each source.

b. Records. At least once each month, the quantity produced from each source of supply shall be determined. Twelve-month totals by sources shall be recorded and transmitted to the Commission in the utility's annual report to the Commission.

III. Standards of Design

1. General. The system shall be adequate to deliver the water requirements of all customers and meet the requirements of paragraph II 3 a.

2. Distribution System.

a. Minimum Pipe Sizes. The distribution system shall be of adequate size and so designed in conjunction with related facilities to maintain the minimum pressures required by paragraph II 3 a. In special cases pipes of small diameter may be installed provided the utility shall meet the requirements of the Pipe Size Determination Chart (Chart 1) appended hereto, which chart is adopted as a part of these rules. In addition, the maximum length of small pipelines shall not exceed the following:

	<u>Circulating</u>	<u>Non-Circulating</u>
1-inch nominal size	150 feet	100 feet
1-1/2-inch nominal size	300 feet	200 feet
2-inch nominal size	500 feet	250 feet

b. Fire Protection. Specifications, location, installation, and the responsibility for the maintenance of fire hydrants, public and private fire protection facilities, connecting mains, and their ownership may be subject to negotiation between the utility and the applicant. Fire hydrants and public and private fire protection facilities shall be installed to the requirements of the utility and when owned by the utility shall be subject to such conditions as the Commission may determine based upon the compensation received for this service.

3. Transmission System. The transmission pipelines from sources of supply shall be designed to deliver in combination with related storage facilities and to the limits of the capacity of those sources of supply the maximum requirements of that portion of the system which is dependent upon such transmission pipelines.

4. Water Supply Requirements. The quantity of water delivered to the distribution system from all source facilities should be sufficient to supply adequately, dependably and safely the total requirements of all customers under maximum consumption, and should be determined so as to maintain the specified pressures as required by paragraph II 3 a. The utility may make use of the Water Supply Requirements Chart (Chart 2) appended hereto and made a part of these Minimum Standards for average requirements of service. For other than such average requirements, the results obtained from Chart 2 shall be supplemented as appropriate.

5. Materials and Specifications.

a. Qualification. Metallic and nonmetallic materials may be used separately and in combination to construct component parts of a water system including, but not limited to, conduits, pipes, couplings, caulking materials, protective linings and coatings, services, valves, hydrants, pumps, tanks and reservoirs; provided:

(1) The material shall have a reasonable useful service life.

(2) The material shall be capable of withstanding with ample safety factors the internal and external forces to which it may be subjected in service.

(3) The material shall not cause the water to become impure, unwholesome, unpotable or unhealthful.

(4) Materials and equipment shall be so selected as to mitigate corrosion, electrolysis and deterioration.

b. Specification. Materials and equipment shall be specified by a properly qualified person.

c. Newly Developed Materials and Equipment. It is not the intention to prevent the use of newly developed materials and equipment that otherwise meet the requirements of paragraphs a and b, above.

d. Minimum Requirements for Steel Pipeline. The requirements as set forth in paragraphs a, b and c, above, are intended to be general in nature in order to permit full discretion in the selection of proper materials and equipment by the qualified person. However, in distribution and transmission systems the following minimum requirements shall be met in the design of steel pipelines.

(1) Outside Coating. Any of the following, except that those portions laid above ground may be protected on the outside after cleaning by painting only:

(a) Coal tar enamel wrapped as specified by American Water Works Association Specification No. C204.

(b) Asphalt with asbestos felt or fiberglass wrapping in accordance with the Specifications shown in Appendix B.

(c) Reinforced concrete in accordance with American Water Works Association Specification No. C205.

(2) Inside Lining. Any of the following:

(a) Coal tar enamel in accordance with American Water Works Association Specification No. C204.

(b) Asphalt as specified in the Specifications shown in Appendix B.

(c) Cement lining in accordance with American Water Works Association Specification No. C205 or Federal Specification WWP 406, where applicable.

(3) Pipes Under 4-inches Outside Diameter. Pipes under 4-inches in outside diameter may be dipped in asphalt after cleaning without wrapping, provided they have a minimum wall thickness of 12-gauge. If wrapped outside in accordance with the specifications outlined in paragraph d(1), above, the minimum gauge shall be 14-gauge.

(4) Pipes 4-inches Outside Diameter and Larger. The wall thickness of pipes 4-inches in outside diameter and larger shall meet the following minimum gauge requirements:

(a) 4-inch O.D. to and including 6-5/8-inch O.D. pipe - 12-gauge.

(b) 7-inch O.D. to and including 10-3/4-inch O.D. pipe - 10-gauge.

(c) Pipes over 10-3/4-inches in outside diameter shall be of 10-gauge minimum steel thickness.

All such pipes shall meet the standard specifications of the American Water Works Association Specification No. C202 and be of adequate design for the existing conditions.

(5) Exception when Used for Reinforcing. Where steel pipe is used as reinforcing for cement coated and lined pipe, steel of lesser wall thickness may be used provided the design is such that the strength of the reinforced concrete is equal to the American Water Works Association Specification No. C202 or Federal Specifications SS-P-381 for a steel pipe of the same diameter.

IV. Standards of Construction

1. General. The design and construction of the utility's water plant shall conform to standard acceptable engineering practices. It shall be designed and operated so as to provide reasonably adequate and safe service to its customers and shall conform to the requirements of the state or local Department of Public Health with reference to sanitation and potability of water.

2. Disinfection of Facilities. All new mains, pumps, tanks, wells and other facilities for handling potable water and insofar as practicable, repaired mains and other facilities, shall be thoroughly disinfected before being connected to the system. The method of disinfection shall be as approved by the State Department of Public Health.

3. Mains.

a. Depth of Mains. Water mains should be installed below the frost line or be otherwise protected to prevent freezing and shall not have less than 30-inches of cover over the top of the pipe in public streets or alleys except where it is necessary to avoid underground obstructions or rocky or hardpan conditions where such depth is not feasible.

b. Dead Ends. Insofar as practicable, the utility shall design its distribution system so as to avoid dead ends in its mains. Where dead ends are necessary, the utility shall provide a means for flushing the mains where the normal consumption does not provide adequate circulation of the water. Mains with dead ends shall be flushed as often as necessary to maintain the proper quality of the water.

c. Segmentation of System. Valves shall be provided in distribution mains at reasonable intervals so that repairs may be effected by the utility with interruptions to the service of a minimum number of customers. When feasible, valves shall be provided in the mains at intervals not to exceed one continuous block or 500 feet, whichever is greater, except where a dead end run is not intended to serve any intervening customers.

d. Grid Systems. Wherever feasible, the distribution system shall be laid out in a properly segmented grid so that in case of breaks or repairs the interruption to service to the customers can be kept to a minimum in number.

4. Service Connections.

a. Size of Service Pipe. The size, design, material and installation of the service pipe shall conform to the reasonable requirements of the utility, provided, however, that the minimum size of the pipe shall not be less than 3/4-inch nominal size. The utility may require the customer to provide such data as may be necessary for the utility to properly size a service larger than 3/4-inch nominal size consistent with the requirements of paragraph II 3 a. The utility in installing 3/4-inch and 1-inch services may use the following formula as a guide provided the requirements of paragraph II 3 a are met:

3/4-Inch Service

Residential Lot Area	-	Metered Service	-	8,000 square feet
		Flat Rate Service	-	10,000 square feet
Business	-	Not over 10 outlets and only one flush-o-meter toilet.		

1-Inch Service

- Residential Lot Area - Metered Service - 8,000 to 20,000 square feet
- Flat Rate Service - 10,000 to 25,000 square feet
- Business - From 10 to 30 outlets and from 1 to 2 flush-o-meter toilets.

b. Depth of Service Pipe. Except in unusual conditions all service pipes shall be laid at a depth sufficient to prevent freezing, except where services are not intended for use during freezing weather and are actually drained prior to such weather, and at a depth of not less than 18 inches except at its termination in connecting with the meter or customer's piping.

V. Extension of Service

1. Mains. Each utility shall file with this Commission as a part of each of its regularly filed tariff schedules a main extension rule in conformity with Decision No. 50580 of this Commission dated September 28, 1954 and as reported in 53 Cal. PUC Page 490.

2. Service Connections.

a. Ownership of Service.

(1) Charge for Service Connections. The utility shall make no charge to a customer for making a service connection except in case of connections for private fire protection service, connections for temporary service, or where for irrigation service additional connections are requested for the convenience of the customer or because of divisions of land ownership when the land before division was receiving irrigation service.

(2) Utility's Responsibility. In urban areas with dedicated front streets, rear service roads, or public utility easements the utility shall furnish and install the service pipe, curb stop, meter and meter box at its own expense for the purpose of connecting its distribution system to the customer's piping, except, for temporary services, and as otherwise provided in the utility's main extension rules. The service connection, curb stop, meter and meter box may be installed at a convenient place between the property line and the curb, or inside the customer's property line where necessary. The service connection shall determine the point of delivery to the customer of water service by the utility. No rent or other charge will be paid by the utility where such utility owned service facilities are located on a customer's premises. In areas which do not have dedicated front streets, rear service roads, or public utility easements the utility shall furnish and install the service pipe, curb stop, meter and meter box at a convenient point on or near the customer's property except for service beyond the service area.

(3) Customer's Responsibilities Precedent to Receiving Service. The customer as a condition precedent to receiving service shall furnish and lay the necessary piping to make the connection from the service connection to the place of consumption and shall keep such piping in good repair in accordance with such reasonable requirements of the utility as may be incorporated in its rules. A main valve shall also be provided by the customer on his piping between the service connection and the point of use. Where service is rendered at or near the service area boundary for use beyond the service area the customer will be required to install, operate and maintain the facilities necessary to provide service.

b. Location of Service. The customer's piping shall extend to that point on the curb line or property line easiest of access to the utility from its existing distribution system or requiring the least extension of the existing distribution main. The utility should be consulted before installation thereof and its approval of a location secured.

VI. Measurement of Service

1. Method of Measuring Service.

a. Metering. All water sold by a utility shall be upon the basis of metered volume sales except that the utility may at its option provide flat rate or estimated service for the following:

(1) Residential, business, commercial, industrial (in special situations) and irrigation service after authorization has first been obtained from the Commission.

(2) Temporary service where the water use can be readily estimated.

(3) Public and private fire protection service.

(4) Water used for street sprinkling and sewer flushing, when provided for by contract between the utility and the municipality or other local governmental authority.

b. Registration of Meter. All meters used for metered sales excluding sales from irrigation systems or other irrigation sales shall have registration devices indicating the volume of water in either cubic feet or United States gallons. Where a constant or multiplier is necessary to convert the meter reading to cubic feet or gallons, the constant shall be indicated on the meter or on the meter reading sheet.

c. Irrigation Meters. Irrigation service may be provided with meters which measure in acre feet or miner's inch days. This service may also be rendered on a volume basis by the use of a calibrated orifice such as the miner's inch box, by the use of weirs or otherwise measured as provided in applicable tariff schedules.

d. Charge for Meter Installation. No utility shall charge for its installation of any devices for metering service to a customer, except for temporary service where the utility may charge its actual cost of installation and removal of its metering devices or where irrigation service is rendered through more than one outlet for the convenience of the customer.

2. Meter Test Facilities and Equipment.

a. Test Facilities. Each utility furnishing metered water service shall provide the necessary standard facilities, instruments and other equipment for testing its meters in compliance with these rules. Any utility may be excepted from this requirement provided that satisfactory arrangements are made for test of its meters by another utility or agency equipped to test meters in compliance with these rules.

b. Shop Equipment. The meter test shop shall be provided with the necessary equipment to test up through 2-inch displacement meters, including a quick acting valve for controlling the starting and stopping of the test and a device for regulating the flow of water through the meter under test. The accuracy of the test equipment and test procedures shall be sufficient to enable shop test of displacement meters with an error not to exceed 0.3 of 1%.

c. Test Measurement Standards. Measuring devices for test of meters shall consist of calibrated tanks for volumetric measurement, tanks mounted upon scales for weight measurement or standard meters.

(1) Basic Standards. When a volumetric tank is used, it shall be accompanied by a certificate of accuracy acceptable to the Commission from a County Sealer of Weights and Measures or from a standards laboratory. When a weight standard is used, the scales shall be tested and calibrated at least once every year by such approved laboratory, or County Sealer of Weights and Measures and a record maintained of the results of the test. Standard meters may be used for field tests of meter accuracy provided they are tested and calibrated to permit the test of meters within the limits of accuracy required by these rules, either by the utility with its volumetric or weight standard equipment or by an approved laboratory at least once every 60 days while the standard meter is in use and a record of such tests shall be kept by the utility for a period of not less than five years.

(2) Size of Basic Standards. When basic standards are used for meter tests, they shall be of a capacity sufficient to insure accurate determinations. The minimum requirement for testing disc meters from 5/8 x 3/4-inch through 2 inches in size shall include a 10 and a 1 cubic-foot tank for meters registering in cubic feet or a 100 and a 10-gallon tank for meters registering in gallons.

3. Accuracy Requirements of Water Meters.

a. General. All meters used for measuring quantities of water delivered to customers shall be in good mechanical condition, shall be adequate in size and design for the type of service which each measures and shall be accurate to within generally accepted standards. The standards of accuracy for displacement meters are set forth in paragraphs b and c, following.

b. Test Flows. For determination of minimum test flow and normal test flow limits, the Commission adopts as a guide the appropriate standard specifications of the American Water Works Association for the various types of meters. These test flows for displacement type cold water meters are as follows:

<u>Nominal Meter Size</u> <u>Inches</u>	<u>Minimum Test Flow</u> <u>Gallons per Minute</u>	<u>Normal Test Flow</u> <u>Limits</u> <u>Gallons per Minute</u>
5/8 or 5/8 x 3/4	1/4	1 - 20
3/4	1/2	2 - 30
1	3/4	3 - 50
1-1/2	1-1/2	5 - 100
2	2	8 - 160
3	4	16 - 300
4	7	28 - 500
6	12	48 - 1000

c. Determination of Accuracy. Displacement meters shall be tested at three or more test flows: one at the minimum test flow, one at 10% of the maximum normal test flow limit and one at a rate over 35% of the maximum normal test flow limit. A meter shall not be placed in service if it registers less than 95% of

the water passed through it at the minimum test flow or over or under registers more than 1-1/2% in the normal test flow limits; with the exception that a repaired meter shall register not less than the following appropriate percentage of the water passed through it at the minimum test flow and shall not over or under register more than 2% in the normal test flow limits,

If manufactured on or after January 1, 1947 90%
If manufactured prior to January 1, 1947 85%

d. Sealing of Meter. Upon completion of adjustment and test of any water meter under the provisions of these rules, the utility shall affix thereto a suitable seal in such a manner that adjustment or registration of the meter cannot be tampered with without breaking the seal.

e. Record of Test. A complete record of all displacement and other mechanical meter tests and data sufficient to allow checking of test calculations, shall be recorded by the meter tester. Such record shall include: the identifying number of the meter; the type and size of the meter; the constant of the meter; the date and kind of tests made; the reading of the meter before making any test; the error as found at each test; and, if readjusted, the percentage of registration as left after each test. The complete record of tests of each meter shall be retained for at least five years.

4. Initial Tests and Storage of Meters. Every water meter shall be tested as required by these rules prior to its installation either by the manufacturer, the utility or any reliable organization equipped for meter testing. Each meter should be stored in an inverted position, and unless so stored it shall be so tested immediately before installation.

5. Repaired or Tested Meters. All water meters removed from service for repair or tested in accordance with these rules shall be restored to the prescribed limits of accuracy as required by these rules before again being placed in service.

6. Periodic Tests of Water Meters.

a. General. The length of time that a meter shall be allowed to remain in service before receiving test and repair should be determined from an economic analysis.

b. Test Periods.

(1) Adoption of Test Periods by Utility. A utility may adopt a test period for the periodic test of meters within any well defined separate system as the utility may deem appropriate, based upon a consideration of relevant economic factors and accuracy of meters, provided authorization for such test period for any such separate system is first obtained from the Commission. Requests for such authorization may be made by an application and showing of necessity by letter.

(2) Test Periods if Not Adopted by Utility. Unless a test period for such periodic tests of meters shall have been adopted as provided in paragraph (1), above, no meter shall be allowed to remain in service more than ten years from the time when last tested without again being retested in the manner provided by these rules. Nothing in these rules shall be construed to mean that such periodic tests may not be made more frequently than once in every ten years.

(3) Meters in Service at the Time These Rules Become Applicable. Each utility shall test its meters installed previous to the time these rules become applicable progressively over the next succeeding ten-year period from such time or over such other period as may be adopted as provided in paragraph (1), above, as the applicable periodic test period within any well defined separate system. The order of test of these meters shall be such that those in service the longest period of time over the applicable periodic test period from the time when last tested shall be tested first whenever feasible.

(4) Provision for Initial Five-Year Grace Period. When application is to be made for authorization of a test period under paragraph (1), above, the utility shall have a period of five years from the effective date of these rules within which to adopt a test period for the periodic test of meters within any well defined separate system as the utility may deem appropriate and the provisions of paragraphs (2) and (3), above, shall not be applicable to the utility during such five-year period so long as the utility shall be reasonably engaged in the work necessary to the adoption of such test period or shall be awaiting Commission authorization with respect to a request therefore submitted to the Commission. When such application is to be made hereunder and the utility desires to avail of such five-year period the utility shall notify the Commission in writing within one year from the effective date of these rules.

c. Report of Periodic Tests of Meters. Each utility shall make a summary of all periodic tests of meters made each calendar year as required by these rules and shall submit such summary to the Commission by not later than March 15th of the year following.

7. Tests on Customer Request.

a. Compliance by Utility. The utility shall within one week after request by a customer proceed to test the meter serving his premises, except where service is rendered from open conduits such test may be deferred for a reasonable length of time when it would necessitate the interruption to service to any other customer. Such test of meters other than displacement meters shall consist of an acceptable method of verifying the accuracy of the meter.

b. Charge for Test. No charge shall be made for such a test, except where a customer requests a test within six months after installation of the meter or more often than once a year, in which cases the customer shall be required to deposit with the utility the following amount to cover the cost of each such test:

<u>Size of Meter</u>	<u>Amount of Deposit</u>
One inch or smaller	\$2.00
Larger than one inch	3.50

c. Test Procedure. Every meter tested at the request of a customer shall be tested in the condition as found in the customer's service prior to any alteration or adjustment in order to determine the average meter error. This test shall consist of

testing at the three rates of flow as determined in paragraph 3c, above, and in addition, at twice the minimum test flow. The average meter error shall be considered to be the algebraic average of the errors of the three highest test flows.

d. Return of Deposit. Any deposit made under paragraph b, above, will be returned to the customer if the average meter error is found to be more than 2% fast. The customer will be notified not less than five days in advance of the time and place of the test.

e. Location of Test. A customer shall have the right to require the utility to conduct the test in his presence or in the presence of his representative. Where the utility has no proper meter testing facilities available locally, the meter may be tested by a meter manufacturer or its agency, or by any other reliable organization equipped for water meter testing or by the utility's meter testing plant where located in some other community, in which latter case the utility upon demand of the customer shall furnish the customer with a notarized statement certifying as to the method used in making the test and as to the accuracy of the meter.

f. Report of Test to Customer. A report showing the results of the test shall be furnished to the customer within 15 days after completion of the test.

8. Meter Records. Each utility shall keep records giving for each displacement and other mechanical meter owned and used by it for any purpose the identification number, name of manufacturer, serial number, type, size and the address of the premises where the meter has been in service, with dates of installation and removal. These records shall also give condensed information concerning all tests including dates. The records shall be maintained in a manner such that the date of the last test is readily determinable.

VII. Rates and Billing

1. Filing of Tariffs. Each utility shall file with the Commission its tariff schedules containing all tariff sheets in accordance with the procedure provided for in General Order 96.

2. Information on Bills. Each utility shall render a bill to each customer for each billing period. Bills for metered service shall show at least the reading of the meter at the end of the period for which the bill is rendered, the meter constant, if any, the number and kinds of units, and date of the current meter reading.

3. Adjustment of Bills for Meter Error.

a. Fast Meters. When, upon test, a meter is found to be registering more than 2% fast, the utility shall refund to the customer the amount of the overcharge based on corrected meter readings for the period the meter was in use but not to exceed a period of six months.

b. Slow Meters.

(1) Commercial Service. When, upon test, a meter used for commercial (residential and business) service is found to be registering more than 25% slow, the utility may bill the customer for the amount of the undercharge based upon corrected meter readings for the period the meter was in service but not to exceed a period of three months.

(2) Other Than Commercial Service. When, upon test, a meter used for other than commercial service, is found to be registering more than 5% slow, the utility may bill the customer for the amount of the undercharge based upon corrected meter readings for the period the meter was in service but not to exceed a period of three months.

c. Nonregistering Meters. The utility may bill the customer for water consumed while the meter was nonregistering, but not to exceed a period of three months, at the minimum monthly meter rate, or upon an estimate of the consumption based upon the customer's prior use during the same season of the year if conditions were unchanged, or upon an estimate based upon a reasonable comparison with the use of other customers during the same period receiving the same class of service under similar circumstances and conditions.

d. General. When it is found that the error in a meter is due to some cause, the date of which can be fixed, the overcharge or the undercharge shall be computed back to but not beyond such date.

APPENDIX A

Sections of Rules Governing Water Service including Minimum Standards for Design and Construction which shall be applicable to utility water systems supplying water not intended or claimed to be potable from ditches, canals, or other conduits.

Section I - General

All paragraphs of the section, except items (2), (3), and (4) of paragraph 10a.

Section II - Standards of Service

Paragraphs 2 and 4 of this section, except that paragraph 2c shall not apply to scheduled interruptions as provided in applicable tariffs.

Section III - Standards of Design

None.

Section IV - Standards of Construction

None.

Section V - Extension of Service

Paragraph 2a (1) of this section.

Section VI - Measurement of Service

All paragraphs of the section, except when sales are measured by other than displacement meters as provided in applicable tariff schedules only paragraphs 1, 3a and e, 5, 6a, 7a, e and f and 8 shall apply.

Section VII - Rates and Billing

All paragraphs of the section, except when sales are measured by other than displacement meters as provided in applicable tariff schedules only paragraphs 1, 2 and 3c and d shall apply.

APPENDIX B

Specification
For
The Coating and Wrapping of Steel Water Pipe

1. Scope.

These specifications cover the material for the asphalt coating of steel water pipe by the double dip process and the wrapping of same with asbestos felt or fiberglass.

2. Materials.

Asphalt: Asphalt shall be Union Oil Company's "190 Pipe Dip", or an approved equivalent, and shall conform to the physical requirements set forth below. (Penetration and softening points shall meet the ASTM standard methods of test as specified under the specification Designations ASTM-D5-52 and ASTM-D36-26, respectively.)

Penetration at 115° F	0.75 cm max.
Penetration at 77° F	Not less than 0.27 cm
Penetration at 32° F	Not less than 0.20 cm
Softening point	Not less than 190° F
Flash point	Not less than 425° F
Ductility at 77° F	Not less than 2.0 cm
Solubility in CCl ₄	Not less than 99.0%
Loss on heating (% by weight)	0.75 max.
Penetration after loss on heating	80% min.

3. Wrapping, Asbestos Felt or Fiberglass.

After completion of asphalt coating of pipe it shall be machine wrapped with asbestos felt or fiberglass. The wrapping shall be completely sealed and bonded onto the dipped pipe by use of a hot asphaltic coating composition. This asphalt seal coat shall also be applied between the overlaps of the wrapping. Special sections, such as tapers, elbows, and other fittings, may be wrapped by hand. The wrapping shall be applied in a spiral manner providing a minimum overlap of 1/2-inch. It shall be applied smoothly under suitable mechanical tension to give a good tight wrapping free from wrinkles, buckles, air pockets and tears. At each end of each section of pipe the wrapping shall be omitted for a sufficient distance to permit making the field joints. The minimum distance shall be such as to expose at least 1-inch of asphalt.

4. Cleaning of Pipe.

All metal surfaces to be coated shall be thoroughly cleaned of all loose mill scale, dirt, oil, grease, rust and other foreign matter.

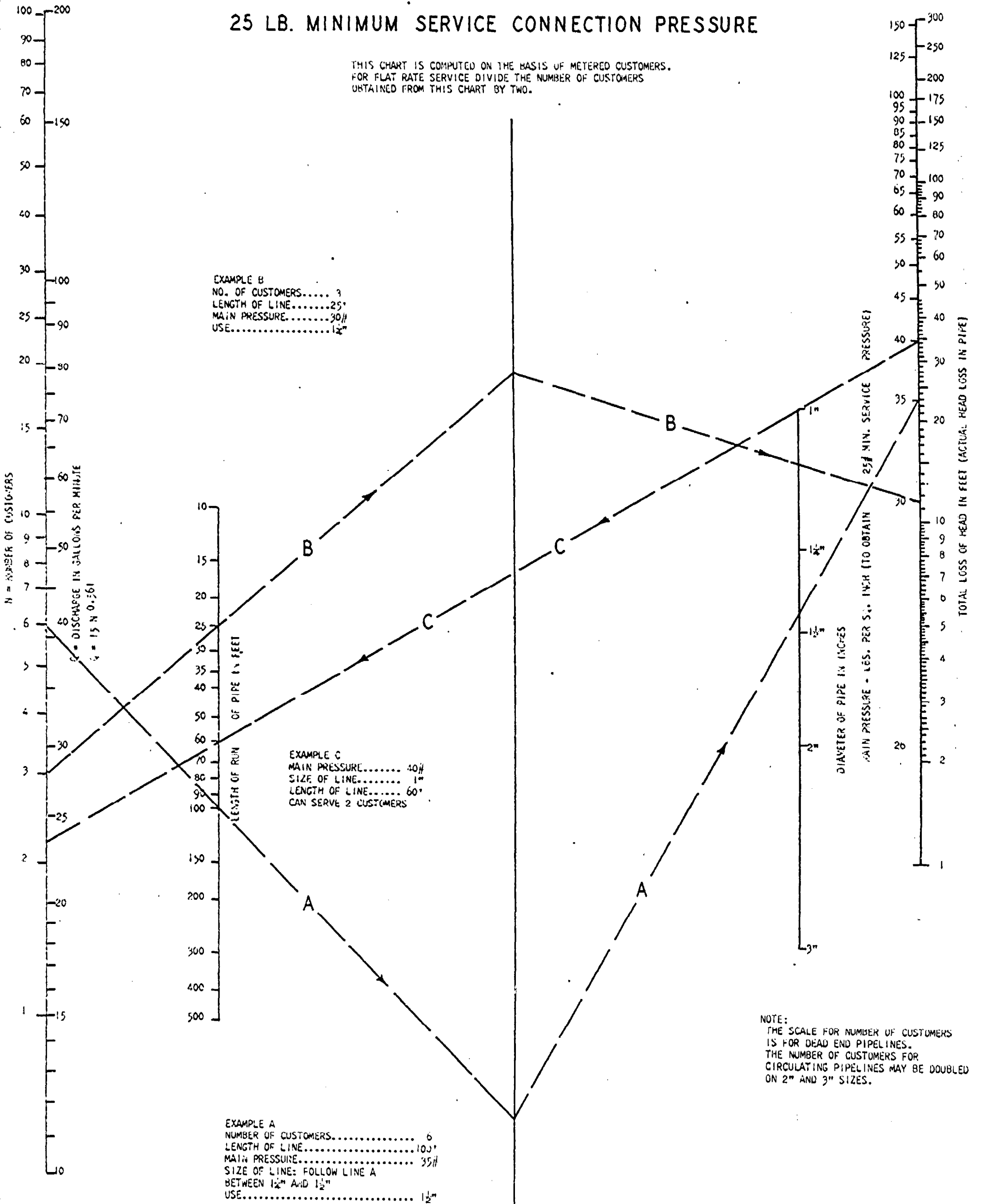
5. Transporting and Handling Coated Pipe.

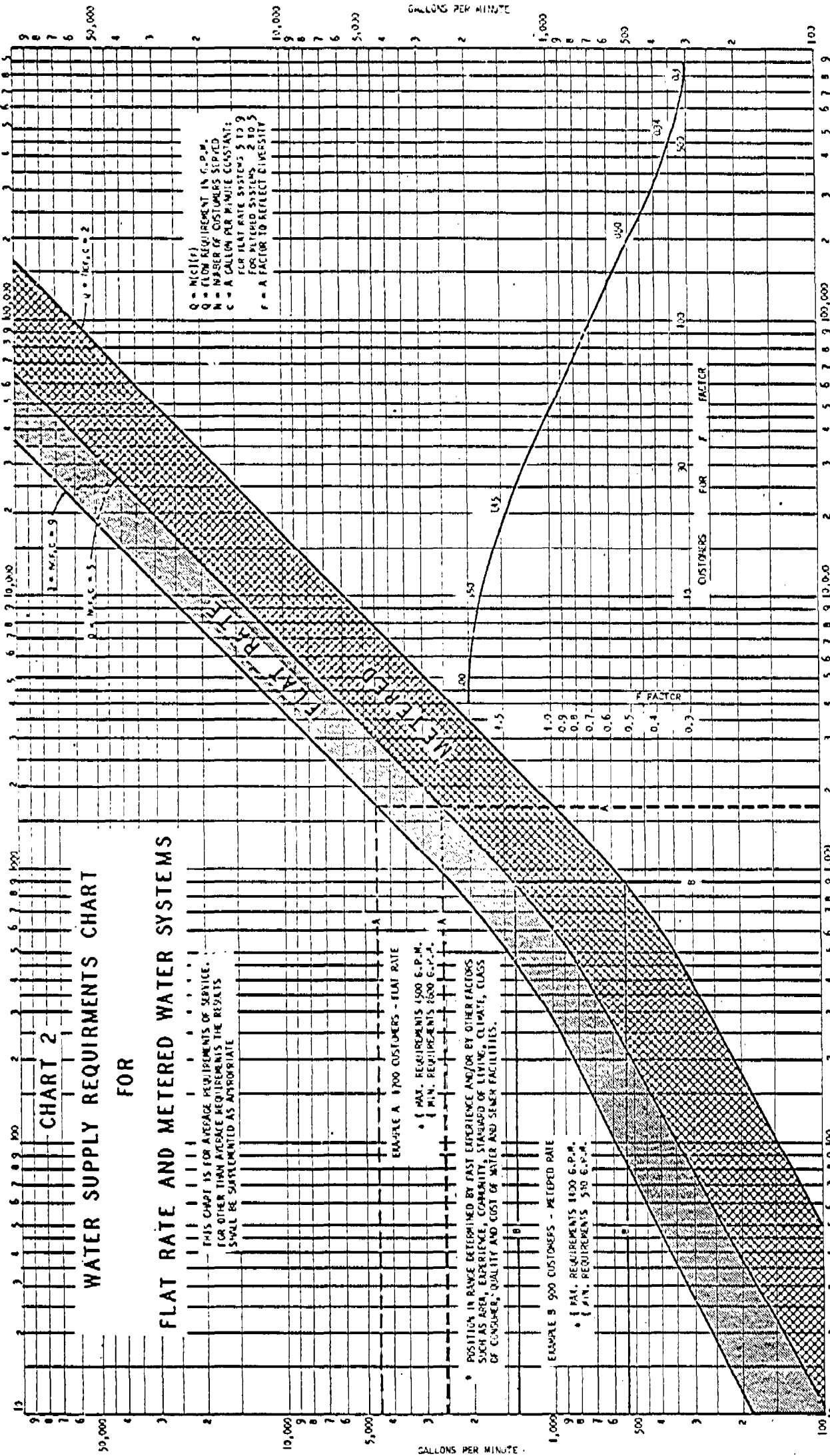
The coated pipe shall at all times be handled in such manner, and with such equipment, as will prevent any damage to the protective coating. In loading pipe for shipment, adequate blocking, cradles, braces and padding shall be used as necessary to properly support and secure the pipe and to prevent any abrasion or other damage to the coating in transit.

CHART I

PIPE SIZE DETERMINATION CHART FOR SINGLE PIPE RUNS FOR GIVEN LENGTH OF LINE AND NUMBER OF CUSTOMERS 25 LB. MINIMUM SERVICE CONNECTION PRESSURE

THIS CHART IS COMPUTED ON THE BASIS OF METERED CUSTOMERS.
FOR FLAT RATE SERVICE DIVIDE THE NUMBER OF CUSTOMERS
OBTAINED FROM THIS CHART BY TWO.





CUSTOMERS