JACK SQUIRES

Original

FILE COPY

CITY OF NEWBERG
CITY RECORDER INDEX NO. 1079

CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

1970

WATER DISTRIBUTION SYSTEM IMPROVEMENTS

CITY OF NEWBERG

OREGON

JUNE 1970

8-10-70

CORNELL, HOWLAND, HAYES & MERRYFIELD

Engineers and Planners

SEATTLE CORVALLIS BOISE PORTLAND

CITY OF NEWBERG
CITY RECORDER INDEX NO. 1079

Contractor:
Jack Squires General Contractors, Inc.
2155 Lafayette Avenue
McMinnville, Oregon

Project No. C5510.2
Project: 1970 Water Distribution System Improvements
Owner: City of Newberg, Oregon
Change Order No. 1
Date: 10 September 1970

CHANGE ORDER NO. 1 TO CONTRACT
FOR
the construction of
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
CITY OF NEWBERG, OREGON

This Change Order covers the changes indicated below to the subject Contract, and the Contractor is hereby directed to perform the work in accordance with the provisions of this Change Order.

1. PROPOSAL

Delete the items, quantities, and prices in the Contractor's Proposal, Pages 2 through 6, and substitute the revised items and quantities and prices on Pages 2 through 6 appended hereto and by this reference made a part of this Change Order.

2. PLANS

Sheets 1 through 17 of the Plans bound in the Contract Documents (Drawing No. C5510-1, dated June 1970) have been revised to reflect the changes in quantities shown in this Change Order No. 1. The revised drawings are bound herewith and shall be used for construction of the 1970 Water Distribution System Improvements.

The amount of the basic Contract will be decreased in the sum of FIFTY THOUSAND ONE HUNDRED SEVENTY-SEVEN AND 81/100 DOLLARS ($50,177.81), and it is agreed that this decrease constitutes full credit for all work deducted by this Change Order. The Performance and Payment Bond shall be decreased to reflect the above change.

Actual quantities for unit price payments will be determined in accordance with the provisions of the Contract Documents.

Contract time will not be increased.

Jack Squires General Contractors, Inc.
Project No. C5510.2
Change Order No. 1
Date: 3 September 1970

Except as herein modified, the terms of the basic Contract shall remain in full force and effect.

Approved:
CORNELL, HOWLAND, HAYES & MERRYFIELD, INC.

By Andis Meadows
Date 10 Sept. 1970

Appended hereto:
(1) Revised Pages 2 through 6 of Contractor's Proposal.
(2) Revised Sheets 1 through 17 of the Plans.

Receipt acknowledged and terms and conditions agreed to this _____ day of _____, 19___.

Authorized for the CITY OF NEWBERG, OREGON this _____ day of _____, 19___.

JACK SQUIRES GENERAL CONTRACTORS, INC.

By Jack Squires
Title Pres

By Orville Belonga
Title Mayor

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum In Writing	Total Amt.- Quan. x Unit Price or Lump Sum
2A. TRENCH EXCAVATION AND BACKFILL					
Trench Excavation and Backfill					
Class C	161	lin.ft.	$ .75	*seventy-five cents*	$ *120.75*
Class D	1,739	lin.ft.	$ *2.25*	*two dollars and twenty-five cents*	$ *3,912.75*
Class E	1,256	lin.ft.	$ *1.15*	*one dollar and fifteen cents*	$ *1,444.40*
Class F	37	lin.ft.	$ *2.75*	*two dollars and seventy-five cents*	$ *101.75*
Class H	2,344	lin.ft.	$ *1.00*	*one dollar*	$ *2,344.00*
Class J	2,893	lin.ft.	$ *1.90*	*one dollar and ninety cents*	$ *5,496.70*
Foundation Stabilization					
	24	cu.yds.	$ *6.00*	*six dollars*	$ *144.00*
Removal and Replacement of Topsoil					
	1,230	lin.ft.	$ .25	*twenty-five cents*	$ *307.50*
2B. SURFACE RESTORATION					
Removal and Replacement of Asphalt Concrete Pavement					
	1,760	lin.ft.	$ .55	*fifty-five cents*	$ *968.00*

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
Removal and Replacement of Asphalt Concrete Pavement	15	sq.yds.	$ 3.00	three dollars	$ 45.00
Removal and Replacement of Concrete Curbs	8	lin.ft.	$ 2.60	two dollars and sixty cents	$ 20.80
Removal and Replacement of Drainage Culverts	25	lin.ft.	$ 2.00	two dollars	$ 50.00
Replacement of Gravel Surface	12	cu.yds.	$ 4.00	four dollars	$ 48.00
15A. CAST IRON PIPE AND FITTINGS					
4-Inch Pipe, Cass 22	10	lin.ft	$ 5.00	five dolars	$ 50.00
6-Inch Pipe, Class 22	1,534	lin.ft.	$ 3.10	three dollars and ten cents	$ 4,755.40
8-Inch Pipe, Class 22	609	lin.ft.	$ 4.00	four dollars	$ 2,436.00

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
10-Inch Pipe, Class 22	3,768	lin.ft.	$ 4.96	four dollars and ninety six cents	$ 18,689.28
12-Inch Pipe, Class 22	42	lin.ft.	$ 10.50	ten dollars and fifty cents	$ 441.00
Cast Iron Fittings	8,334	lbs.	$ .38	thirty-eight cents	$ 3,166.92
Mechanical Couplings	28	Dia.-Inches	$ 6.00	six dollars	$ 168.00
Flanged Coupling Adapters	50	Dia.-Inches	$ 12.00	twelve dollars	$ 600.00
Imported Granular Pipe Base Material	1,200	lin.ft.	$ .30	thirty cents	$ 360.00
Imported Granular Backfill for the Pipe Zone	1,200	lin.ft.	$ .70	seventy cents	$ 840.00
15B. CONCRETE CYLINDER PIPE AND FITTINGS					
16-Inch Pipe and Fittings, Class 150	2,465	lin.ft.	$ 13.34	thirteen dollars and thirty-four cents	$ 32,883.10

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum In Writing	Total Amt.- Quan. x Unit Price or Lump Sum
15C. VALVES AND VALVE BOXES					
Butterfly Valves with Buried Operator and Valve Boxes					
6-Inch	20	each	$ 125.00	one hundred twenty-five dollars	$ 2,500.00
8-Inch	2	each	$ 177.00	one hundred seventy-seven dollars	$ 354.00
10-Inch	7	each	$ 275.00	two hundred seventy-five dollars	$ 1,925.00
12-Inch	2	each	$ 309.00	three hundred nine dollars	$ 618.00
16-Inch	3	each	$ 885.00	eight hunded eighty-five dollars	$ 2,655.00
Gate Valves and Valve Boxes					
4-Inch	5	each	$ 93.00	ninety-three dollars	$ 465.00
Corporation Stops					
3/4-Inch	3	each	$ 25.00	twenty-five dollars	$ 75.00
15D. FIRE HYDRANT ASSEMBLIES					
Fire Hydrant Assemblies	11	each	$ 250.00	two humred fifty dollars	$ 2,750.00
Hydrant Transfers	2	each	$ 100.00	one hundred dollars	$ 200.00
Guard Post	1	each	$ 35.00	thirty-five dollars	$ 35.00

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum In Writing	Total Amt.- Quan. x Unit Price or Lump Sum
16A. ELECTRICAL TEST LEAD STATIONS					
	3	each	$ *70.00*	*seventy dollars*	$ *210.00*
				TOTAL	$ *91,180.35*

UNITED PACIFIC INSURANCE COMPANY No.

SYMBOL OF SERVICE

A MEMBER OF UNITED PACIFIC INSURANCE GROUP

HOME OFFICE: TACOMA 1, WASHINGTON

FIDELITY AND SURETY DEPARTMENT

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS:

That the UNITED PACIFIC INSURANCE COMPANY, a corporation of the State of Washington, having its principal offices in the city of Tacoma, Washington, pursuant to authority granted by By-Law No. 37-A of its By-Laws, which reads as follows:

"The President, any Executive Vice-President, any other Vice-President, any Assistant Vice-President, or any Resident Vice-President of this Corporation, shall have authority to appoint in writing such attorneys-in-fact as the business of the Company may require, and to authorize such attorneys-in-fact, and each of them, to execute on behalf of the Company, any bonds, recognizances, stipulations, contracts of indemnity and other undertakings of like character, or to exercise any lesser number of said powers as hereinbefore set forth.

"Said appointments shall be attested by the Secretary or an Assistant Secretary of this Corporation under its seal. The signature of the Secretary or any Assistant Secretary to certified copies of such powers of attorney may be original or facsimile, and when the corporate seal is affixed thereto, any third party may rely on said certified copies of powers of attorney as the act and deed of this Corporation. The President, any Executive Vice-President, any other Vice-President, any Assistant Vice-President, or any Resident Vice-President may revoke any appointment made pursuant hereto, and revoke any and all authority conferred by any such appointment."

does hereby nominate, constitute and appoint MARY STENSON of McMINNVILLE, OREGON----------

its true and lawful Attorney-in-Fact, to make, execute, seal and deliver for and on its behalf, as surety, and as its act and deed,

any and all bonds and undertakings of suretyship----------

The execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Company, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the Company at its office in Tacoma, Washington, in their own proper persons.

IN WITNESS WHEREOF, the UNITED PACIFIC INSURANCE COMPANY has caused these presents to be signed by its----------Vice-President and its corporate seal to be hereto affixed, duly attested by its Assistant Secretary, this 9th day of August, 19 66.

UNITED PACIFIC INSURANCE COMPANY

Attest: s/ GERRY L. WHITE
Assistant Secretary

By s/ MORRIS E. BROWN (SEAL)
Vice-President

STATE OF WASHINGTON }
County of PIERCE } ss.

On this 9th day of August, 19 66, before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared MORRIS E. BROWN and GERRY L. WHITE to me known to be the Vice-President and Assistant Secretary, respectively, of UNITED PACIFIC INSURANCE COMPANY, the corporation that executed the foregoing instrument and acknowledged the said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that they were authorized to execute the said instrument and that the seal affixed is the corporate seal of said corporation.

WITNESS my hand and official seal hereto affixed the day and year in this certificate above written.

s/ IRENE C. KRIER

Notary Public in and for the State of Washington residing at Tacoma

STATE OF WASHINGTON }
County of PIERCE } ss.

I, GERRY L. WHITE, Assistant Secretary of the UNITED PACIFIC INSURANCE COMPANY, do hereby certify that the copy of By-Law No. 37-A, set forth in the foregoing instrument, is a true copy of said by-law and now in force, and I do hereby further certify that the Power of Attorney above set forth was duly and regularly executed by said UNITED PACIFIC INSURANCE COMPANY in its usual form, and that the seal thereto affixed is the corporate seal of said Company, and that said Power of Attorney is in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Company at the City of Tacoma this 9th day of August, 19 66

s/ GERRY L. WHITE (SEAL)
Assistant Secretary

STATE OF WASHINGTON }
County of PIERCE } ss.

I, GERRY L. WHITE, Assistant Secretary of the UNITED PACIFIC INSURANCE COMPANY, do hereby certify that the foregoing instrument is a true copy of a Power of Attorney duly and regularly issued by said Company, and that the same is still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of said Company at the City of TACOMA this 16th day of September, 1970.

Gerry L. White (SEAL)
Assistant Secretary

B-1027A—Rev. 5-57—General—Power of Attorney

CITY OF NEWBERG
CITY RECORDER INDEX NO. 1079

ADDENDUM NO. 1
to the
CONTRACT DOCUMENTS
for the construction of
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
CITY OF NEWBERG, OREGON

To All Planholders:

28 July 1970

Gentlemen:

Project No. C5510.1

The following change is hereby made a part of the Contract Documents for the construction of 1970 Water Distribution System Improvements, dated June 1970, as fully and completely as if the same were fully set forth therein:

1. ADVERTISEMENT FOR BIDS

Page 1, Paragraph 1, Line 4. Change the date of bid opening from the "3rd day of August" to the "10th day of August" 1970.

All bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered informal.

Very truly yours,

CORNELL, HOWLAND, HAYES & MERRYFIELD

Archie E. Meadows

Archie E. Meadows

Receipt acknowledged and conditions agreed to this 10 day of August 1970.

Jack Squire's Gen Cont Inc.
Bidder

By Jack Squires

****

CITY OF NEWBERG

OREGON

CONTRACT DOCUMENTS

for the construction of the

1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

****

Consisting of:
Form of Bid Bond
Advertisement for Bids
Form of Proposal
Form of Contract
Form of Performance and Payment Bond
Information for Bidders
Special Provisions
General Conditions
Special Specifications
Standard Specifications
Plans

****

Cornell, Howland, Hayes & Merryfield
Engineers-Planners-Economists
Corvallis, Oregon

June 1970

Project No. C5510.1

Copy No. 90

TABLE OF CONTENTS

		Page
CONTRACTOR'S PREQUALIFICATION FORM (Bound Inside Front Cover)		
BID BOND	Bid Bond	*
ADVERTISEMENT FOR BIDS	Adv.	1
PROPOSAL	Proposal	1
CONTRACT FOR CONSTRUCTION	Contract	1
PERFORMANCE AND PAYMENT BOND	P & P Bond	*
INFORMATION FOR BIDDERS	Info.	*
General Description of the Project		1
Contract Documents		1
Plans		1
Type of Proposal		1
Preparation of Proposals		2
Submission of Proposals		2
Telegraphic Modification or Withdrawal of Proposal		2
Bid Security		2
Prequalification of Bidders for Public Work		3
Conditions of Work		3
Payments		3
Award of Contract		3
Basis of Award		3
Execution of Contract		4
Performance Bond		4
Failure to Execute Contract and Furnish Bond		4
Time of Completion		4
SPECIAL PROVISIONS	Sp. Prov.	
Specification Format		1
Location and Plans		1
Revisions to Information for Bidders		1
Revisions to the General Conditions		1
Substitution of Materials		3
No Personal Liability of Public Officials		3
Arbitration		3
Termination Because of a National Emergency		3
Crestview Drive Pipeline Easements		3
Lowest Acceptable Proposal		4
Permit for Work on Oregon State Highway and Yamhill County Rights-of-Way		4
Insurance and Bonding Requirements		4
WAGE RATES - BASIC BUILDING TRADES		*
WAGE RATES - SPECIALTY BUILDING TRADES	Wage Rates	1

TABLE OF CONTENTS (Cont'd.)

		Page
PUBLIC WORKS CONTRACTOR WAGE CERTIFICATION FORM		*
GENERAL CONDITIONS	Gen. Cond.	*
Definitions		1
Contract Documents		1
The Engineer		3
The Contractor and His Employees		5
Progress of the Work		10
Payment		13
SPECIAL SPECIFICATIONS	Sp. Specs.	
Foreword		1
DIVISION 1 - GENERAL REQUIREMENTS		
1A. General Requirements		3
DIVISION 2 - SITE WORK		
2A. Trench Excavation and Backfill		11
2B. Surface Restoration		18
DIVISIONS 3 thru 14 - Not Used.		
DIVISION 15 - MECHANICAL		
15A. Cast Iron Pipe and Fittings		24
15B. Concrete Cylinder Pipe and Fittings		35
15C. Valves and Valve Boxes		45
15D. Fire Hydrant Assemblies		47
15E. Air and Vacuum Release Valve Assemblies		49
15F. Blowoff Valve Assemblies		51
DIVISION 16 - ELECTRICAL		
16A. Electrical Test Lead Stations		53
STANDARD DETAIL NO'S. 100, 101, 103, 109, 110, 111, 112, 113, & 204		
PLANS		

A MEMBER OF UNITED PACIFIC INSURANCE GROUP
HOME OFFICE: TACOMA, WASHINGTON

Bond No. _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS: That We, JACK SQUIRES GENERAL CONTRACTOR INC. Box 495, McMinnville, Oregon as Principal, and the UNITED PACIFIC INSURANCE COMPANY, a corporation organized and existing under the laws of the State of Washington, and authorized to do business in the State of Oregon as Surety, are held and firmly bound unto the CITY OF NEWBERG, Newberg, Oregon as obligee, in the sum of Ten Per Cent of amount bid (10%) ---------- DOLLARS, lawful money of the United States of America, to the payment of which sum of money well and truly to be made, the said Principal and Surety bind themselves, their and each of their heirs, executors, administrators, successors and assigns, jointly and severally, by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the Obligee shall make any award to the Principal for:

1970 Water Distribution System Improvements
City of Newberg
Newberg, Oregon

according to the terms of the proposal or bid made by the Principal therefor, and the Principal shall duly make and enter into a contract with the Obligee in accordance with the terms of said proposal or bid and award and shall give bond for the faithful performance thereof, with the UNITED PACIFIC INSURANCE COMPANY as Surety or with other Surety or Sureties approved by the Obligee; or if the Principal shall, in case of failure so to do, pay to the Obligee the damages which the Obligee may suffer by reason of such failure not exceeding the penalty of this bond, then this obligation shall be null and void; otherwise it shall be and remain in full force and effect.

Signed, Sealed and Dated this 10th day of August 19 70

COUNTERSIGNED:
HAGAN-HAMILTON INSURANCE
McMinnville, Oregon

By Merrill Hagan
Resident Agent

JACK SQUIRES GENERAL CONTRACTOR INC.
Principal(s)

By: Jack Squires
President

UNITED PACIFIC INSURANCE COMPANY

By: Grace Olinger
Attorney-in-Fact

B-1312-Contract - Bid Bond

ADVERTISEMENT FOR BIDS

Sealed proposals for the construction of the 1970 Water Distribution System Improvements, addressed to the Finance Officer, City of Newberg, Oregon, will be received in the Council Chamber until 7:30 p.m., Pacific Daylight Time, on the 3rd day of August, 1970 and then will be publicly opened and read.

The work contemplated will be the construction of arterial pipelines consisting of pipe, fittings, and appurtenances, with approximate pipeline lengths as follows:

Type	Size	Class	Length
Concrete cylinder	24-inch	100	250 feet
Concrete cylinder	16-inch	150	2,450 feet
Concrete cylinder	12-inch	150	50 feet
Cast iron	6-inch	22	2,485 feet
Cast iron	8-inch	22	850 feet
Cast iron	10-inch	22	7,920 feet

More detailed information concerning these pipelines is contained in the Plans and Specifications.

Plans and Specifications may be examined in the office of M. C. Gilbert, Finance Officer, or at the office of Cornell, Howland, Hayes & Merryfield, Engineers-Planners-Economists, 1600 S.W. Western Boulevard, Corvallis, Oregon 97330. A copy of said Documents may be obtained at the Engineer's office at 1600 S.W. Western Boulevard, Corvallis, Oregon, upon a deposit of Fifty Dollars ($50.00) for each Document. The full amount of the deposit will be refunded if said Documents are returned in good condition within ten (10) days after bid opening.

Bidders must be prequalified in compliance with applicable parts of Chapter 279 of Oregon Revised Statutes. Prequalification forms, completely filled out, shall be mailed to Cornell, Howland, Hayes & Merryfield, 1600 S.W. Western Boulevard, Corvallis, Oregon, at least ten (10) days prior to the bidding date.

No bid will be received or considered by the public body or any officer of the public body unless the bid contains a statement by the Bidder as a part of his bid that the provisions required by ORS 279.350 shall be included in his Contract.

Each proposal must be submitted on the prescribed form and accompanied by a certified check or bid bond executed on the prescribed form payable to the City of Newberg, Oregon, in an amount not less than ten percent (10%) of the amount bid.

The successful Bidder will be required to furnish a bond for faithful performance of the Contract in the full amount of the Contract price.

The right is reserved to reject any or all proposals, to postpone the award of the Contract for a period not to exceed thirty (30) days, and to accept that proposal which is to the best interests of the City of Newberg, Oregon.

Dated this 9th day of July, 1970.

CITY OF NEWBERG, OREGON

By_____
M. C. Gilbert, Finance Officer

****

PROPOSAL

To: Mayor and City Council
City of Newberg
Newberg, Oregon

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Proposal are those named herein; that this Proposal is, in all respects, fair and without fraud; that it is made without collusion with any official of the Owner; and that the Proposal is made without any connection or collusion with any person making another proposal on this Contract.

The Bidder further declares that he has carefully examined the Contract Documents for the construction of the project; that he has personally inspected the site; that he has satisfied himself as to the quantities involved, including materials and equipment, and conditions of work involved, including the fact that the description of the quantities of work and materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the Contract Documents; and that this Proposal is made according to the provisions and under the terms of the Contract Documents, which Documents are hereby made a part of this Proposal. The Bidder further declares that the provisions required by ORS 279.350 relating to prevailing wage rates shall be included in his Contract.

The Bidder further agrees that he has exercised his own judgment regarding the interpretation of subsurface information and has utilized all data which he believes pertinent from the Engineer, Owner, and other sources in arriving at his conclusions.

The Bidder agrees that if this Proposal is accepted, he will, within seven (7) calendar days after notification of acceptance, execute the Contract with the Owner in the form of Contract annexed hereto; and will, at the time of execution of the Contract, deliver to the Owner the Performance and Payment Bond required herein; and will, to the extent of his Proposal, furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete the work in the manner, in the time, and according to the methods as specified in the Contract Documents and required by the Engineer thereunder.

The Bidder further agrees to begin work within ten (10) calendar days after the date of the execution of the Contract and to complete the construction, in all respects, within two hundred seventy (270) calendar days after the date of the execution of the Contract by the Owner.

In the event the Bidder is awarded the Contract and shall fail to complete the work within the time limit or extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid to the Owner at the rate of ONE HUNDRED DOLLARS ($100.00) per day until the work shall have been finished as provided by the Contract Documents. Sundays and legal holidays shall be excluded in determining days in default.

The Bidder further proposes to accept as full payment for the work proposed herein the amounts computed under the provisions of the Contract Documents and based on the following lump sum or unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities involved. The Bidder agrees that the lump sum prices and the unit prices represent a true measure of the labor and materials required to perform the work, including all allowances for overhead and profit for each type and unit of work called for in these Contract Documents.

The amounts shall be shown in both words and figures. In case of a discrepancy, the amount shown in words shall govern.

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
2A. TRENCH EXCAVATION AND BACKFILL					
Trench Excavation and Backfill					
Class C	3,105	lin.ft.	$ .75	seventy-five cents	$ 2,328.75
Class D	2,247	lin.ft.	$ 2.25	two dollars & twenty-five cents	$ 5,055.75
Class E	1,683	lin.ft.	$ 1.15	one dollar & fifteen cents	$ 1,935.45
Class F	136	lin.ft.	$ 2.75	two dollars & seventy-five cents	$ 374.00
Class H	3,244	lin.ft.	$ 1.00	one dollar	$ 3,244.00
Class J	3,430	lin.ft.	$ 1.90	one dollar & ninety cents	$ 6,517.00
Foundation Stabilization					
	40	cu.yds.	$ 6.00	six dollars	$ 240.00
Removal and Replacement of Topsoil					
	4,326	lin.ft.	$ .25	twenty-five cents	$ 1,081.50
2B. SURFACE RESTORATION					
Removal and Replacement of Asphalt Concrete Pavement	2,101	lin.ft.	$ .55	fifty-five cents	$ 1,155.55

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
Removal and Replacement of Asphalt Concrete Pavement	20	sq.yds.	$ 3.00	three dollars	$ 60.00
Removal and Replacement of Concrete Pavement	136	lin.ft.	$ 1.50	one dollar & fifty cents	$ 204.00
Removal and Replacement of Concrete Sidewalks	240	sq.ft.	$ 1.00	one dollar	$ 240.00
Removal and Replacement of Concrete Curbs	160	lin.ft.	$ 2.60	two dollars & sixty cents	$ 416.00
Removal and Replacement of Drainage Culverts	100	lin.ft.	$ 2.00	two dollars	$ 200.00
Replacement of Gravel Surface	40	cu.yds.	$ 4.00	four dollars	$ 160.00
15A. CAST IRON PIPE AND FITTINGS					
4-Inch Pipe, Class 22	10	lin.ft.	$ 5.00	five dollars	$ 50.00
6-Inch Pipe, Class 22	2,485	lin.ft.	$ 3.10	three dollars & ten cents	$ 7,703.50
8-Inch Pipe, Class 22	850	lin.ft.	$ 4.00	four dollars	$ 3,400.00

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
10-Inch Pipe, Class 22	7,916	lin.ft.	$ 4.96	four dollars & ninety-six cents	$ 39,263.36
Cast Iron Fittings	15,000	lbs.	$ .38	thirty eight cents	$ 5,700.00
Mechanical Couplings	48	Dia.-Inches	$ 6.00	six dollars	$ 288.00
Flanged Coupling Adapters	62	Dia.-Inches	$ 12.00	twelve dollars	$ 744.00
Imported Granular Pipe Base Material	2,000	lin.ft.	$ .30	thirty cents	$ 600.00
Imported Granular Backfill for the Pipe Zone	2,000	lin.ft.	$ .70	seventy cents	$ 1,400.00
15B. CONCRETE CYLINDER PIPE AND FITTINGS					
12-Inch Pipe and Fittings, Class 150	52	lin.ft.	$ 67.58	sixty seven dollars & fifty-eight cents	$ 3,514.16
16-Inch Pipe and Fittings, Class 150	2,446	lin.ft.	$ 13.34	thirteen dollars & thirty-four cents	$ 32,629.64
24-Inch Pipe and Fittings, Class 100	250	lin.ft.	$ 28.91	twenty-eight dollars & ninety-one cents	$ 7,227.50

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
15C. VALVES AND VALVE BOXES					
Butterfly Valves with Buried Operator and Valve Boxes					
6-Inch	27	each	$ 125.00	one hundred & twenty-five dollars	$ 3,375.00
8-Inch	2	each	$ 177.00	one hundred & seventy-seven dollars	$ 354.00
10-Inch	11	each	$ 275.00	two hundred seventy-five dollars	$ 3,025.00
12-Inch	2	each	$ 309.00	three hundred & nine dollars	$ 618.00
16-Inch	3	each	$ 885.00	eight hundred & eighty-five dollars	$ 2,655.00
Gate Valves and Valve Boxes					
4-Inch	6	each	$ 93.00	ninety three dollars	$ 558.00
Corporation Stops					
3/4-Inch	3	each	$ 25.00	twenty five dollars	$ 75.00
15D. FIRE HYDRANT ASSEMBLIES					
Fire Hydrant Assemblies	14	each	$ 250.00	two hundred fifty dollars	$ 3,500.00
Hydrant Transfers	4	each	$ 100.00	one hundred dollars	$ 400.00
Guard Post	1	each	$ 35.00	thirty five dollars	$ 35.00

Item	Quantity	Unit of Measure	Unit Price or Lump Sum Figures	Unit Price or Lump Sum in Writing	Total Amt.- Quan. x Unit Price or Lump Sum
15E. AIR AND VACUUM RELEASE VALVE ASSEMBLIES					
	3	each	$ 227.00	two hundred twenty seven dollars	$ 681.00
16A. ELECTRICAL TEST LEAD STATIONS					
	5	each	$ 70.00	seventy dollars	$ 350.00
				TOTAL	$ 141,358.16

It is agreed that if the Bidder is awarded the Contract for the work herein proposed and shall fail or refuse to execute the Contract and furnish the specified Performance and Payment Bond within seven (7) calendar days after receipt of notification of acceptance of his Proposal, then, in that event, the bid security deposited herewith according to the conditions of the Advertisement for Bids and Information for Bidders shall be retained by the Owner as liquidated damages; and it is agreed that the said sum is a fair measure of the amount of damage the Owner will sustain in case the Bidder shall fail or refuse to enter into the Contract for the said work and to furnish the Performance and Payment Bond as specified in the Contract Documents. Bid security in the form of a certified check shall be subject to the same requirements as a bid bond.

If the Bidder is awarded a construction Contract on this Proposal, the Surety who will provide the Performance and Payment Bond will be _____

United Pacific Insurance Co. whose address is

_____ (Street), Tacoma (City), Washington (State).

The name of the Bidder who is submitting this Proposal is _____

Jack Squires Gen. Cont., Inc. doing business at

2155 Lafayette Ave. (Street), McMinnville (City), Oregon (State),
which is the address to which all communications concerned with this Proposal and with the Contract shall be sent.

The names of the principal officers of the corporation submitting this Proposal, or of the partnership, or of all persons interested in this Proposal as principals are as follows:

Jack Squires _____

Bob Squires _____

_____ _____

(If Sole Proprietor or Partnership)

In witness hereto the undersigned has set his (its) hand this _____ day of _____, 19___.

_____
Signature of Bidder

_____
Title

(If Corporation)

In witness whereof the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this 10 day of August, 1970.

Jack Squires Gen. Cont. Inc.
Name of Corporation

By /s/ Jack Squires

Pres.
Title

Attest /s/ Robert V. Squires
Secretary

****

CONTRACT FOR CONSTRUCTION

THIS CONTRACT, made and entered into this _____ day of _____ 19___, by and between the City of Newberg, Oregon, a municipal corporation, hereinafter called the "Owner," and Jack Squires, General Contractor, Inc. of McMinnville, Oregon hereinafter called the "Contractor."

WITNESSETH:

Said Contractor, in consideration of the sum to be paid him by the said Owner and of the covenants and agreements herein contained, hereby agrees at his own proper cost and expense to do all the work and furnish all the materials, tools, labor, and all appliances, machinery, and appurtenances for construction of the water treatment plant expansion to the extent of the Proposal made by the Contractor on the 10th day of August, 1970, all in full compliance with the Contract Documents referred to herein.

The "Advertisement for Bids," the signed copy of the "Proposal" made by the Contractor on the 10th day of August, 1970, the fully executed "Performance and Payment Bond," the "Information for Bidders," the "Special Provisions," the "General Conditions," the "Specifications," and the "Plans," which consist of 17 sheets entitled "City of Newberg, Oregon, 1970 Water Distribution System Improvements," Drawing No. C5510-1, dated June 1970, are hereby referred to and by reference made a part of this Contract as fully and completely as if the same were fully set forth herein and are mutually cooperative therewith.

In consideration of the faithful performance of the work herein embraced, as set forth in these Contract Documents, and in accordance with the direction of the Engineer and to his satisfaction to the extent provided in the Contract Documents, the Owner agrees to pay to the Contractor the amount bid as adjusted in accordance with the Proposal as determined by the Contract Documents, or as otherwise herein provided, and based on the said Proposal made by the Contractor, and to make such payments in the manner and at the times provided in the Contract Documents.

The Contractor agrees to complete the work within the time specified herein and to accept as full payment hereunder the amounts computed as determined by the Contract Documents and based on the said Proposal.

The Contractor agrees to indemnify and save harmless the Owner from any and all defects appearing or developing in the materials furnished and the workmanship performed under this Contract for a period of one (1) year after the date of acceptance of the work in the Contract by the Owner.

The provisions required by ORS 279.350 relating to prevailing wage rates are made a part of this Contract as completely as if the same were fully set forth herein.

It is agreed that the time limit for the completion of the Contract, based upon the Proposal, shall be the _____ day of _____, 19___. In the event that the Contractor shall fail to complete the work within the time limit or the extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid at the rate of ONE HUNDRED DOLLARS ($100.00) per day. Sundays and legal holidays shall be excluded in determining days in default.

IN WITNESS WHEREOF, we, the parties hereto, each herewith subscribe the same this _____ day of _____, A.D., 19___.

CITY OF NEWBERG, OREGON

By Duell Delavan

Title Mayor

Jack Squires Gen. Cont. Inc.
Contractor

By Jack Squires

Title Pres.

Approved as to form:

_____
City Attorney

****

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we JACK SQUIRES, GENERAL CONTRACTORS, Inc., McMinnville, Oregon as Principal, and United Pacific Insurance Company, Tacoma, Washington a corporation, duly authorized to do a general surety business in Oregon, as Surety, are jointly and severally held and bound unto THE CITY OF NEWBERG, OREGON the Obligee herein, in the sum of Ninety-One Thousand, One Hundred Eighty and Thirty-Five/100 (Dollars) ($ 91,180.35), for the payment of which we jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns, firmly by these presents:

THE CONDITION OF THIS BOND IS SUCH THAT

WHEREAS, JACK SQUIRES, GENERAL CONTRACTORS, INC. (Contractor) the Principal herein, on the _____ day of _____, 19__, entered into a Contract with the Obligee, which Contract Documents consist of the Advertisement for Bids, the Proposal, the Contract, the Performance and Payment Bond, the Information for Bidders, the Special Provisions, the General Conditions, the Specifications, and the Plans, all as hereto attached and made a part hereof, whereby said Principal undertakes to do all labor, furnish all plant and equipment, and furnish all material, in accordance with all the terms and conditions set forth in said Contract Documents; and to promptly make payment for all labor, services, material, and sums due the Workmen's Compensation Board, or equivalent, the Collector of Internal Revenue, and the Treasurer of the State of Oregon; and to save harmless the Obligee from any claim for damages or injury to property or persons arising by reason of said work, as set out more fully in said Contract Documents; and to do and perform all things in said Contract Documents required, in the time and manner and under the terms and conditions therein set forth; and in conformity with all laws, State and national, applicable thereto.

Now, therefore, if said Principal herein shall promptly pay all persons furnishing labor, services, and material, and Workmen's Compensation Insurance or equivalent, and Social Security and Unemployment Compensation, to him and to his subcontractor, or to their assigns, on or about said work; and shall, commencing with the date hereof and continuing for one (1) year after

[PUBLIC WORK] June '70

the complete performance of the Contract and the final acceptance of the work in the Contract, save harmless the Obligees, its officers and agents, from all claims therefor, or from any claim for damages or injury to property or persons arising by reason of said work; and shall, in the time and manner, and under the terms and conditions prescribed, well and faithfully do, perform, and furnish all matters and things as by them in said Contract undertaken, and as by law, State and National, prescribed, then this obligation shall be void; but otherwise it shall remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is subject to the following further conditions.

(a) All materialmen, and all persons who shall supply such laborers, mechanics, or subcontractors with material, supplies, or provisions for carrying on such work, shall have a direct right of action against the Principal and Surety on this Bond, second only to the right of the Obligee under this Bond, which right of action shall be asserted in proceedings instituted in the appropriate court of the State of Oregon, and insofar as permitted by the laws of Oregon, such right of action shall be asserted in a proceeding instituted in the name of the Obligee to the use and benefit of the person, firm, or corporation instituting such action and of all other persons, firms, or corporations having claims hereunder, and any other person, firm, or corporation having a claim hereunder shall have the right to be made a party to such proceeding (but not later than one (1) year after the complete performance of said Contract and final acceptance of the work in the Contract) and to have such claim adjudicated in such action and judgment rendered thereon.

(b) In no event shall the Surety be liable for a greater sum than the penalty of this Bond.

(c) The said Surety, for the value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligations on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

(d) The Principal herein shall faithfully and truly observe and comply with the terms of the Contract and shall well and truly perform all matters and things by him undertaken to be performed under said Contract upon the terms proposed therein and shall promptly make payments to all persons supplying labor or material for any prosecution of the work provided for in such Contract and shall not permit any lien or claim to be filed or prosecution against the obligees, on account of any labor or material furnished, and shall promptly pay all contributions or amount due the Workmen's Compensation Board or equivalent and all contributions or amounts due the State Employment Compensation Trust Fund incurred in the performance of said Contract, and shall also pay all sums of money withheld from the employees and payable to the State Tax Commission pursuant to ORS 316.711 and shall promptly, as due, make payment to any person, copartnership, association or corporation furnishing medical, surgical and hospital care or other needed

care and attention incident to sickness or injury to the employees of such Principal, pursuant to the laws of this State and any contract entered into pursuant thereto or collected or deducted from the wages of said employees pursuant to any law, contract, or agreement for the purpose of providing or paying for such services, and shall do all things required of said Principal by the laws of this State.

This Bond is given and received under the authority of ORS Chapter 279, the provisions of which hereby are incorporated into this Bond and made a part hereof.

IN WITNESS WHEREOF, the parties hereto have caused this Bond to be executed in five sets, this _____ day of _____ 19___.

_____ (SEAL)

JACK SQUIRES GEN. CONT. INC. (SEAL)
P. O. BOX 495
McMINNVILLE, OREGON 97128 (SEAL)

by Jack Squires Pres. (SEAL)
Principal

Witnesses:

_____ United Pacific Insurance Company (SEAL)

_____ by Tracy Stenson (SEAL)

_____ attorney-in-fact (SEAL)
Surety

HAGAN-HAMILTON INSURANCE
P. O. BOX 117 PHONE 472-2165
McMINNVILLE, OREGON

Countersigned:

By Merrill C Hagan
Resident Agent

The Attorney-in-Fact (Resident Agent), who executes this Bond in behalf of the Surety Company, must attach a copy of his power-of-attorney as evidence of his authority.

To each executed original of this Bond there must be attached a complete set of the "Contract Documents," as the term is defined in the General Conditions, with all corrections, interlineations, signatures, etc., completely reproduced therein.

****

1. General Description of the Project. A general description of the work to be done is contained in the Advertisement for Bids. The scope is indicated on the accompanying Plans and specified in applicable parts of these Contract Documents.

2. Contract Documents. The Contract Documents under which it is proposed to execute the work consist of the material bound herewith. These Contract Documents are intended to be mutually cooperative and to provide all details reasonably required for the execution of the proposed work. Any person contemplating the submission of a proposal and being in doubt as to the meaning or intent of said Contract Documents should request of the Engineer, in writing, an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing, and a copy of such interpretation or change will be mailed or delivered to each person receiving a set of the Documents. The Owner will not be responsible for any other explanation or interpretations of said Documents.

3. Plans. When the Plans are photographic reductions of the original tracings, the amount of reduction is indicated by a note on the Plans. Full-scale prints of reduced Plans may be obtained for the amount stated in the Special Provisions.

Jul.'70

4. Type of Proposal.

a. Unit Price. When the Proposal for the work is to be submitted on a unit price basis, unit price proposals will be accepted on all items of work set forth in the Proposal, except those designated to be paid for as a lump sum. The estimate of quantities of work to be done is tabulated in the Proposal and, although stated with as much accuracy as possible, is approximate only and is assumed solely for the basis of calculation upon which the award of Contract shall be made. Payment to the Contractor will be made on the measurement of the work actually performed by the Contractor as specified in the Contract Documents. The Owner reserves the right to increase or diminish the amount of any class of work as may be deemed necessary, unless otherwise specified in the Special Provisions.

b. Lump Sum. When the Proposal for the work is to be submitted on a lump sum basis, a single lump sum price shall be submitted in the appropriate place. The total amount to be paid the Contractor shall be the amount of the lump sum Proposal as adjusted for additions or deletions resulting from changes in construction. The Bidder shall furnish, in the space provided in the Proposal, a breakdown of his lump sum bid.

c. Lump Sum with Equipment Selected By Owner. When the Proposal for the work is to be submitted on a lump sum basis with equipment to be selected by the Owner, a lump sum price shall be submitted in the appropriate place and separate price proposals shall be submitted for listed items of equipment as produced by different manufacturers and shall include the cost of installation. The lump sum Proposal shall not include these listed items or cost of their installation. The total amount to be paid the Contractor

shall include the price bid for the listed items of equipment to be furnished as selected by the Owner, plus the amount of the lump sum Proposal, as adjusted for additions and deletions resulting from changes in construction. Bidder shall provide a breakdown of the lump sum as specified hereinbefore in b.

5. Preparation of Proposals. All blank spaces in the Proposal form must be filled in, in ink, in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in cases of discrepancy between the amounts stated in writing and the amounts stated in figures.

Any proposal shall be deemed informal which contains omissions, erasures, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the published Advertisement for Bids.

The Bidder shall sign his Proposal in the blank space provided therefor. Proposals made by corporations or partnerships shall contain names and addresses of the principal officers or partners. If the Proposal is made by a corporation, it must be acknowledged by one of the principal officers thereof; if made by a partnership, by one of the partners.

6. Submission of Proposals. All proposals must be submitted at the time and place and in the manner prescribed in the Advertisement for Bids. Proposals must be made on the prescribed Proposal forms, bound herewith, and submitted intact with the Contract Documents. Each proposal must be submitted in a sealed envelope, so marked as to indicate its contents without being opened, and addressed in conformance with the instructions in the Advertisement for Bids. The Bidder is wholly responsible to see that his Proposal is submitted at the time and place named for the opening of bids.

7. Telegraphic Modification or Withdrawal of Proposal. Any bidder may modify his bid by telegraphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the Owner prior to the closing time. The telegraphic communication should not reveal the bid price but should state the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened.

Any proposal may be withdrawn prior to the scheduled time for the opening of proposals either by telegraphic or written request, or in person. No proposal may be withdrawn after the time scheduled for opening of proposals, unless the time specified in Paragraph 12 of this Information for Bidders shall have elapsed.

8. Bid Security. Proposals must be accompanied by a certified check or cashiers check drawn on a bank in good standing, or a Bid Bond issued by a surety company authorized to issue such bonds in the State of Oregon, in an amount not less than ten percent (10%) of the total amount of the Proposal submitted. This check or Bid Bond shall be given as a guarantee that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish a properly executed Performance Bond in the full amount of the Contract price within the time specified.

If the Bidder elects to furnish a Bid Bond, he shall use the Bid Bond form bound herewith, or one conforming substantially to it in form and content.

The Owner reserves the right to retain the bid security of the three (3) lowest bidders until the successful Bidder has signed and delivered the Contract and furnished a one hundred percent (100%) Performance Bond. Upon failure of the successful Bidder to sign and deliver said Contract and Performance Bond within the specified time, the next lowest bid may be accepted at the Owner's discretion, whereupon the above instructions and requirements will apply to the said second bidder.

Bid security in the form of a certified check or cashiers check will be returned promptly after the canvass of bids, except those of the three (3) lowest bidders, which will be retained and returned within seven (7) days after the Contract has been executed or other disposition made in accordance with the provisions stated herein.

9. Prequalification of Bidders for Public Work. Bidders for public work in Oregon must be prequalified in conformance with Oregon Law ORS, Chapter 279. A prequalification form is bound inside the front cover of the Documents, and must be completed by the prospective Bidder and submitted to the Owner at least ten (10) days prior to the bid opening date. The form shall be detached and filled out by the prospective Bidder and mailed to the office designated in the Advertisement for Bids. Prequalification forms should not be submitted with the bid.

10. Conditions of Work. Each bidder must inform himself of the conditions relating to the execution of the work, and it is assumed that he will inspect the site and make himself thoroughly familiar with all the Contract Documents. Failure to do so will not relieve the successful Bidder of his obligation to enter into a Contract and complete the contemplated work in strict accordance with the Contract Documents.

Each bidder must inform himself on all laws and statutes, both Federal and State, relative to the regular execution of the work, the employment of labor, protection of public health, the protection of private property, fire protection regulations, access to the work, and similar requirements.

11. Payments. Monthly payments for the work performed will be made by the Owner as specified in the General Conditions, unless otherwise modified in the Special Provisions.

12. Award of Contract. Within thirty (30) calendar days after the opening of proposals, the Owner will accept one of the proposals or will act in accordance with Paragraph 13 of this Information for Bidders. The acceptance of the Proposal will be by notice, in writing, mailed or delivered to the office designated in the Proposal.

13. Basis of Award. The award will be made by the Owner on the basis of that Proposal from the lowest responsible Bidder which, in the Owner's sole and absolute judgment, will best serve the interest of the Owner. When projects are paid for in part by Federal aid, the award will be made on the basis of that Proposal submitted by the responsible Bidder submitting the lowest acceptable Proposal.

The Owner reserves the right to accept or reject any or all proposals, and to waive any informalities and irregularities in said proposals.

14. Execution of Contract. The successful Bidder shall, within seven (7) days after receiving notice of award, execute the Contract hereto attached.

15. Performance Bond. The successful Bidder shall file with the Owner at the time of execution of the Contract, a Performance Bond of the form bound herewith in the full amount of the Contract price, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the construction of the work, and to cover all guarantees against defective workmanship or materials, or both, for a period of one (1) year after the date of final acceptance of the work by the Owner. The surety company furnishing this bond shall have a sound financial standing and a record of service satisfactory to the Owner and shall be authorized to do business in the State of Oregon.

The Attorney-in-Fact (Resident Agent) who executes this Performance Bond in behalf of the surety company must attach a copy of his power-of-attorney as evidence of his authority. A notary shall acknowledge the power as of the date of the execution of the surety bond which it covers.

16. Failure to Execute Contract and Furnish Bond. The Bidder who has a Contract awarded to him and who fails to promptly and properly execute the Contract and furnish the bond shall forfeit the bid security that accompanied his bid, and the bid security shall be retained as liquidated damages by the Owner; and it is agreed that this said sum is a fair estimate of the amount of damages the Owner will sustain in case the Bidder fails to enter into a Contract and furnish bond as hereinbefore provided. Bid security deposited in the form of a certified check or cashiers check shall be subject to the same requirement as a Bid Bond.

17. Time of Completion. The time of completion of the work to be performed under this Contract is the essence of the Contract. Delays and extensions of time may be allowed in accordance with the provisions of the General Conditions. The time allowed for the completion of the work is stated in the Proposal.

SPECIAL PROVISIONS

The Contractor's attention is directed to GENERAL REQUIREMENTS, Section IA of the Special Specifications, containing other directions pertinent to the project.

SPECIFICATION FORMAT. "Command" type sentences are used in the Contract Documents; these refer to and are directed to the Contractor.

LOCATION AND PLANS.

LOCATION. The location of the work is shown on Drawing No. C5510-1, Sheet 1 of 17 of the Plans.

PLANS. The Plans for the construction of the water distribution system improvements consist of 17 sheets, each entitled "City of Newberg, Oregon, 1970 Water Distribution System Improvements," and dated June 1970.

REVISIONS TO INFORMATION FOR BIDDERS. The Information for Bidders is hereby revised as follows:

General. On Pages 1, 2, 3, and 4 wherever the words "Performance Bond" are used, delete the words and substitute "Performance and Payment Bond."

Page 1, after 3. Plans, insert the following:

3.a. Full-Scale Plans Available. The Plans bound in the Documents are photographic reductions of the original tracings. Full-scale Plans are available from Cornell, Howland, Hayes & Merryfield, 1600 S.W. Western Boulevard, Corvallis, Oregon 97330, at a cost of Twenty Dollars ($20.00) per set, Ten Dollars $10.00) of which will be refunded if Plans are returned within ten (10) days after bidding date.

Page 3, Article 9. Prequalification of Bidders for Public Work. The Bidder's Prequalification Form is to be mailed to the Corvallis office of the Engineer as designated in the Advertisement for Bids.

REVISIONS TO THE GENERAL CONDITIONS. The General Conditions are hereby revised as follows:

Page 4, Article C-6. Lines and Grades. Add the following:

The Engineer will establish the locations of waterlines by means of offset stakes set at 50-foot intervals and will indicate the depth of cut when required. The Contractor shall lay out the work from the offset stakes given and transfer elevations from cut stakes as required.

Page 5, Article D-2. Performance Bond. Delete "Performance Bond" and substitute "Performance and Payment Bond" in all places.

Page 12, Article E-7. Delays and Extension of Time. Add the following:

In addition to the conditions for extension of time as set forth in Article E-7 of the General Conditions, no extension of time will be considered for weather conditions known to have previously occurred in the area in which the work is being performed, unless the total precipitation during any two (2) month period exceeds the recognized normal for these months by twenty percent (20%) or more as determined by the U.S. Weather Bureau Climatological Data.

Page 15, Article F-2. Extra Work. At the end of the Article add the following:

F-2.d. Claims. In any case where the Contractor deems extra compensation is due him for work or materials not clearly covered in the Contract or not ordered by the Engineer as an extra as defined herein, the Contractor shall notify the Engineer, in writing, of his intention to make claim for such compensation before he begins the work on which he bases the claim. If such notification is not given, or the Engineer is not afforded proper facilities by the Contractor for keeping strict account of actual cost, then the Contractor hereby agrees to waive the claim for such extra compensation. Such notice by the Contractor, and the fact that the Engineer has kept account of the cost as aforesaid, shall not in any way be construed as proving the validity of the claim. In case the claim is found to be just, it shall be allowed and paid for as an extra as provided herein for extra work, or it shall be allowed and paid under a supplemental agreement to be entered into between the parties to the Contract.

F-2.e. Notice of Claim for Delay. If the Contractor intends to file a claim for additional compensation for a delay caused by the Owner at a particular time, he shall file a Notice of Claim with the Engineer within seven (7) days of the beginning of the occurrence. The Notice of Claim shall be in duplicate, in writing, and shall state the circumstances and the reasons for the claim, but need not state the amount. No claim for additional compensation will be considered unless a Notice of Claim has been filed with the Engineer, in writing, as stated above.

Page 16, Article F-4. Final Payment. At the end of the Article add the following:

F-4.a. No Waiver of Rights. Neither the inspection by the Owner, through the Engineer or any of his employees, nor any order by the Owner for payment of money, nor any payment for, or acceptance of, the whole or any part of the work by the Owner or Engineer, nor any extension of time, nor any possession taken by the Owner or its employees, shall operate as a waiver of any provision of this Contract, or any power herein reserved to the Owner, or any right to damages herein provided; nor shall any waiver of any breach in this Contract be held to be a waiver of any other or subsequent breach.

SUBSTITUTION OF MATERIALS. All workmanship, equipment, materials, and articles incorporated in the work are to conform to the Specifications. Whenever any material, article, device, product, fixture, form, type of construction, or process is indicated or specified by patent or proprietary name, by name of manufacturer, or by catalog number, such Specifications shall be deemed to be used for the purpose of establishing a standard of quality and facilitating the description of the material or process desired. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design, and shall be deemed to be followed by the words "or as approved" or "approved equal." The Contractor may, in such case, submit complete data to the Engineer for consideration of another material, type, or process, and if the Owner's approval is obtained (in writing), purchase and use the item, type, or process, which shall be substantially equal in every respect to that so indicated or specified. The Owner will be the sole judge of the substituted article or material. No substitute materials shall be used unless approved in writing.

NO PERSONAL LIABILITY OF PUBLIC OFFICIALS. In carrying out any of the provisions hereof in exercising any authority granted by the Contract, there will be no personal liability upon any public official, it being understood that in such matters they act as agent and representative of the Owner.

ARBITRATION. Any controversy arising out of or relating to this Contract, or the breach thereof shall be settled by arbitration in accordance with the Rules of the American Arbitration Association and judgment upon the award rendered by the arbitrator or arbitrators may be entered in any Court having jurisdiction thereof.

The Contractor shall not delay the work because arbitration proceedings are pending unless he shall have written permission from the Engineer to do so. Such delay shall not extend beyond the time when the arbitrators shall have opportunity to determine whether the work shall continue or be suspended pending decision by the arbitrators of such a dispute. Any demand for arbitration shall be in writing and shall be delivered to the Engineer and any adverse party either by personal delivery or by registered mail addressed to the last known address of each within ten (10) days of receipt of the Engineer's decision, and in no event after final payment has been made and accepted, subject, however, to any express stipulation to the contrary in the Contract Documents.

TERMINATION BECAUSE OF A NATIONAL EMERGENCY. If work on this project is terminated by order of a competent Governmental authority because of a national emergency, the Owner or the Contractor, each at his option, with or without the consent of the other, may, upon seven (7) days' written notice, stop work or terminate the Contract. The Contractor shall recover payment from the Owner for all work executed, but in no event shall the Contractor be allowed any sum or sums in addition to those above specified, except that a reasonable profit may be allowed upon the work actually executed. In no event shall the Contractor be allowed any damages or any anticipated profits whatsoever.

CRESTVIEW DRIVE PIPELINE EASEMENTS. The Owner is in the process of obtaining easements from private property owners along the route of this line

at the time of advertisement for bids. If, during the time of construction of this Contract, it becomes evident to the Engineer that the easement for all or any part of the Crestview Drive section of the Plans between approximate Stations 30+00 and 60+57 cannot be obtained, this section of the pipeline will be deleted from the Contract at the appropriate reduction in quantities and costs, and without compensation to the Contractor for any anticipated profit. The Owner at such time shall also have the option of selecting an alternate route for this section of pipeline and negotiating a price or unit prices with the Contractor for the construction of such alternate pipeline route.

LOWEST ACCEPTABLE PROPOSAL. The lowest acceptable Proposal on a unit price basis will be the lowest Proposal submitted in accordance with the provisions of the Contract Documents.

If at the time the contracts are to be awarded, the sum of the lowest bid for the Contract by a responsible Bidder, does not exceed the amount of funds then estimated by the Owner as available to finance the Contract, the Contract will be awarded. If the bids exceed the amount of funds available, the Owner may decrease the quantity of pipelines and the appurtenances to be constructed or reject any or all bids. In the event the quantity of pipelines and appurtenances under this Contract are to be decreased, the pipelines will be deleted from the work as necessary in the following order:

North Street	Station	0+00	to	Station 2+40
Sherman Street	Station	0+00	to	Station 2+40
Fulton Street	Station	10+00	to	Station 21+29

PERMIT FOR WORK ON OREGON STATE HIGHWAY AND YAMHILL COUNTY RIGHTS-OF-WAY. The Owner will obtain from the Oregon State Highway Department and Yamhill County the necessary permits for work within the State Highway or County rights-of-way. A copy of the permits will be available at the Newberg City Hall. The Contractor will be required to abide by all regulations and conditions stipulated in the permits, and such conditions and requirements are hereby made a part of these Contract Documents as fully and completely as though the same were fully set forth herein. The Contractor shall examine the permits granted to the City of Newberg by the Highway Department and Yamhill County; failure to do so will not relieve the Contractor from compliance with the requirements stated herein.

Deposits, insurance, and all other costs, except the costs of the permits, shall be paid by the Contractor.

INSURANCE AND BONDING REQUIREMENTS.

OREGON STATE HIGHWAY DEPARTMENT. The Contractor shall provide insurance as prescribed in Article D-3. Insurance, subsection d., of the GENERAL CONDITIONS.

The Contractor shall provide the cash deposit or surety bond in the amount designated by the Oregon State Highway Department. The surety bond shall be made payable to the Oregon State Highway Department. The surety bond shall be in force for a period of one year from the date of acceptance

of the work to cover all guarantees against defective workmanship and materials and other requirements for work within the rights-of-way as specified. The surety company furnishing the bond shall have a good financial standing and a record of service satisfactory to the Owner and the Oregon State Highway Department, and shall be authorized to do business in the State of Oregon. The Contractor shall pay all costs for this bond.

YAMHILL COUNTY. The Contractor shall provide insurance in the following amounts:

Bodily Injury Liability	Each Person	$100,000
	Each Accident	$200,000
Property Damage Liability	Each Occurrence ...	$ 50,000

The Contractor shall provide a cash deposit or surety bond in the amount of $5,000. The surety bond shall be made payable to the County. The surety bond shall be in force for a period of one year from the date of acceptance of the work to cover all guarantees against defective workmanship and materials and other requirements for work within the rights-of-way as specified. The surety company furnishing the bond shall have a good financial standing and a record of service satisfactory to the Owner and the County, and shall be authorized to do business in the State of Oregon. The Contractor shall pay all costs for this bond.

Upon completion of the work and before final payment, the Contractor shall provide the Owner with written releases from the County Engineer of Yamhill County and the District Maintenance Superintendent of the Oregon State Highway Department, stating that the work has been satisfactorily performed and meets the requirements of the County and the Oregon State Highway Department.

****

Revised June 1970

Bureau of Labor
Public Contracts Wage Administrator
1400 S. W. Fifth
State Office Building
Portland, Oregon

Prevailing Journeyman Wage Rates in Oregon for Basic Building Trades (as determined by the Labor Commissioner pursuant to ORS 279.348 to 279.356)

The following prevailing journeyman wage rates apply to the basic construction trades -- Carpenters, Piledrivers, Cement Masons, Ironworkers, Laborers, Operating Engineers, and Teamsters; applicable to all counties in the State of Oregon for the effective period indicated.

BUILDING AND CONSTRUCTION TRADES — Effective 5-1-70 to 6-1-71

CARPENTERS

Group I — $6.03

Carpenters (journeymen), including but not limited to Acoustical & Drywall applicators
Automatic Nailing Machine Operators (all types)
Form Strippers (in accordance with Int. Agree.)
Manhold Builders (Concrete Form Construction)
Riggers, Burners, and Welders
Saw Filers, Instrument Men and Fiberglas Specialists

Group II — $6.155

Caulkers (Boat construction)
Floor Layers, Finishers
(The laying of all hardwood flooring, nailed and mastic set, parquet and wood-type tiles, and block floors, the sanding and finishing of floors, the preparation of old and new floors where the materials mentioned above are to be installed.)
Insulators (Fiberglass and similar irritating materials)
Working on Charred Material (Building construction only)
Working on Swinging, Hanging Nonrigid Scaffolding, Bos'n Chairs, or suspended from a rope or cable or from a safety belt.
(Men working on scaffolding attached to form panels or forms which are hanging or swinging are entitled to premium pay so long as the forms are hanging; after such panels are firmly attached to make them rigid, premium pay is no longer applicable)
Stationary Power Saw Operators

Foremen — $6.53

Apprentice Rates

1st	6-mo.	period	65%	of	Journeyman	rate	5th 6-mo. period	85% of Journeyman rate	
2nd	"	"	70%		"	"	6th " "	90% "	"
3rd	"	"	75%		"	"	7th &		
4th	"	"	80%		"	"	8th " "	95% "	"

Overtime - All work performed before and/or after any scheduled shift hours, and all work performed on Saturdays, Sundays and holidays shall be paid at double the straight time hourly rate.

CARPENTERS FRINGE BENEFTS

H & W	Pension	Vacation	Apprentice Fund	Industry Fund
$.25	.25	.25	.03	.01

PILEDRIVERS — Effective 5-1-70 to 6-1-71

Piledrivermen, Bridge, Dock & Wharf Builders	$6.13
Piledrivermen Riggers	6.13
Burnermen and Welders	6.13
Instrument Men	6.13
Boom Men	6.23
Foremen	6.63

Overtime - All work performed before and/or after any scheduled shift hours, and all work performed on Saturdays, Sundays and holidays shall be paid at double the straight time hourly rate.
15¢ premium allowance working with creosote material.

PILEDRIVERS FRINGE BENEFITS

H & W	Pension	Vacation	Apprentice Fund	Industry Fund
$.25	.25	.25	.03	.01

MILLWRIGHTS — Effective 5-1-70 to 6-1-71

Millwrights and Machine Erectors (Journeyman Riggers, Burners and Welders)	$6.28
Instrument Men	6.28
Foreman	6.78

MILLWRIGHTS FRINGE BENEFITS

H & W	Pension	Vacation	Apprentice Fund	Industry Fund
$.25	.25	.25	.03	.01

CEMENT MASONS

Effective 8-1-70 to 8-1-71

Journeyman Cement Mason	$6.01
Journeyman Mastic Worker, Composition Worker, Gunite Man, Power Machinery Operator	6.135

Overtime - Double time for overtime shall be paid for all overtime after ten (10) hours per day Monday through Friday and double time for all Saturday work. Time and one-half if notified seven days in advance for Saturday work; double time for Sundays and holidays.
Foreman - 25% above Journeyman rate

CEMENT MASONS' FRINGE BENEFITS

H & W	Pension	Apprenticeship and Training	Industry Fund
$.25	.20	.09	.01

IRON WORKERS

Effective 7-21-70 to 7-21-71

Structural Ironworkers	$6.83
Ornamental Ironworkers	6.83
Machinery Mover, Machinery Erector	6.83
Riggers	6.83
Signal Men	6.83
Welders and Burners	6.83
Fence Erectors	6.83
Sheeters	6.83
Reinforcing Ironworkers	6.72

Foreman - 3 men or less - not less than 30¢/hr. over Journeyman rate
4 men or more - not less than 55¢/hr. over Journeyman rate
Overtime - Double time
Apprentice - 1st year 80% of Journeyman Ironworker rate
2nd year 90% of Journeyman Ironworker rate
3rd year 95% of Journeyman Ironworker rate

IRONWORKERS' FRINGE BENEFITS

H & W	Pension	Apprenticeship
$.43	.27	.01

HOISTING AND PORTABLE ENGINEERS' WAGE RATES

Group #	Effective 6-1-70 to 6-1-71
1	$5.66
2	5.78
3	5.90
4	6.04
5	6.08
6	6.14

HOISTING AND PORTABLE ENGINEERS' WAGE RATES - contd.

Group #	Effective 6-1-70 to 6-1-71
7	6.22
8	6.30
9	6.38
10	6.42
11	6.46
12	6.50
13	6.60
14	6.74
15	6.92
16	7.08
17	7.24
18	7.40
19	7.56

HOISTING AND PORTABLE ENGINEERS' FRINGE BENEFITS

H & W	Pension	Vacation	Industry Fund
$.35	.40	.10	.03

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION

Group	Asphalt
6	Asphalt Plant Operator, (Assistant to Engineer required)
1	Plant Oiler
3	Plant Fireman
3	Pugmill Operator
8	Diesel - Electric engineer, Plant
3	Truck-mounted Asphalt Spreader, with screed
4	Screed Operator
5	Curb Machine Operator, mechanical berm, curb and/or curb and gutter
6	Asphalt Paver Operator, (Screed man required)
7	Roller Operator, asphalt or finish
	Blade
2	Blade Operator, pulled type
12	Blade Operator
13	Blade Operator, finish (Working with either red or blue tops)
13	Blade Operator, electronically controlled by wire or laser beams
13	Blade Operator, multiengine
16	Auto Grader (i.e. CMI) or "Trimmer" Operator (grade checker required)

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	
	Bulldozers
9	Bulldozer Operator
9	Drill Cat Operator
9	Side-Boom Cat Operator
10	Bulldozer Operator, twin engine. (TC 12 and similar type)
16	Tandem Bulldozer Operator, Quad-nine and similar type
10	Cable - Plow Operator
	Compactors, Self-Propelled
4	Compactor Operator, including vibratory
5	Wagner pactor Operator or similar type (without blade)
9	Compactor Operator, with blade
10	Compactor Operator, multiengine
	Compressors
3	Compressor Operator, any power, under 1,000 cu.ft. total capacity
4	Compressor Operator, over 1,000 cu.ft. total capacity
	Concrete
1	Plant Oiler
3	Mixer Box Operator, concrete plant
4	Concrete Mixer Operator, single drum, under five (5) bag capacity
5	Batch Plant Material Control Operator
7	Concrete Mixer Operator, single drum, five (5) bag capacity and over (Assistant to Engineer required)
8	Batch Plant and/or Wet Mix Operator, one and two drum (Assistant to Engineer required)
9	Concrete Cooling Machine Operator
12	Batch Plant and/or Wet Mix Operator, three (3) units or more (Assistant to Engineer required)
11	Mixer Mobile Operator
1	Assistant Conveyor Operator
3	Concrete Conveyor Operator
7	Beltcrete Operator
7	Pumpcrete Operator
7	Cement Pump Operator, Fuller-Kenyon and similar
4	Combination Mixer and Compressor Operator, gunite work
7	Grouting Machine Operator
7	Concrete Pump Operator
3	Cement Hog Operator
3	Concrete Saw Operator, self-propelled unit
3	Wire Mat Machine Operator, or Brooming Machine Operator
3	Concrete Curing Machine Operator, self-propelled

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Concrete - contd.
4	Screed Operator
6	Maginnis Internal Full Slab Vibrator Operator
6	Concrete Finishing Machine Operatory, Clary, Johnson, Bidwell, Burgess bridge deck or similar type
6	Curb Machine Operator, mechanical berm, curb and/or curb and gutter
6	Concrete Joint Machine Operator
6	Concrete Planer Operator
6	Cast-in-place Pipe Laying Machine Operator
7	Tower Mobile Operator
6	Concrete Paving Machine Operator (Assistant to Engineer required)
6	Concrete Finishing Machine Operator
6	Concrete Spreader Operator
13	Concrete Paving Road Mixer Operator
16	Automatic Concrete Slip Form Paver Operator (Assistant to Engineer required)
5	Power Jumbo Operator setting slip forms, etc., in tunnels
5	Slip Form Pumps, power driven hydraulic lifting device for concrete forms.
16	Concrete Canal Liner Operator (Assistant to Engineer required)
	Crane
1	Oiler
2	Truck Crane Oiler-driver, 25 ton capacity or over
2	Fireman, all equipment
2	A-Frame Truck Operator, single drum
7	A-Frame Truck Operator, double drum
2	Tugger or Coffin Type Hoist Operator, any power
7	Boom Truck Operator
5	Hoist Operator, single drum
12	Hoist Operator, two drum
12	Hoist Operator, three (3) or more drums
4	Helicopter Hoist Operator
5	Elevator Operator
13	Bridge Crane Operator, locomotive, gantry, overhead
9	Chicago Boom and similar types
9	Lift Slab Machine Operator
9	Boom Type Lifting Device, five (5) ton capacity or less
9	Cherry Picker or similar type crane-hoise, five (5) ton capacity or less
13	Derrick Operator, under one-hundred (100) ton. [Two (2) operators required when swing control is remote from hoist]
13	Hoist Operator, stiff leg, Guy Derrick or similar type, fifty (50) ton and over
13	Cableway Operator, up to twenty-five (25) ton

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Crane - contd.
16	Cableway Operator, twenty-five (25) ton and over
11	Crane Operator, twenty-five (25) ton and under (Assistant to Engineer required) (except for rough terrain)
13	Crane Operator, over twenty-five (25) ton and including forty (40) ton. (Assistant to Engineer required)
16	Crane Operator, over forty (40) ton and including one-hundred (100) ton (Assistant to Engineer required)
17	Crane Operator, over one-hundred (100) ton and including two-hundred (200) ton (Assistant to Engineer required)
18	Crane Operator, over two-hundred (200) ton (Assistant to Engineer required)
13	Tower Crane Operator
16	Whirley Operator, eighty (80) ton and under (Assistant to Engineer required)
17	Whirley Operator, over eighty (80) ton and including one-hundred fifty (150) ton (Assistant to Engineer required)
18	Whirley Operator, one-hundred fifty (150) ton and over (Assistant to Engineer required)
19	Helicopter Operators, when used in erecting work
	Crusher
1	Crusher Oiler
1	Crusher Feederman
8	Generator Operator
8	Diesel - Electric Engineer
9	Grizzley Operator
9	Crusher Plant Operator (Assistant to Engineer and Feederman required)
	Drilling
2	Drill Helper
2	Auger Oiler
7	Churn Drill and Earth Boring Machine Operator (Assistant to Engineer)
9	Drill Doctor
9	Boring Machine Operator (Assistant to Engineer)
10	Driller - Percussion, Diamond, Core, Cable, Rotary and similar types (Assistant to Engineer required)
	Floating Equipment
1	Deckhand
4	Fireman
2	Boatman
8	Diesel - Electric Engineer
13	Piledriver Operator (not crane type) (Deckhand required)

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Floating Equipment - contd.
13	Floating Clamshell, etc., Operator, under one (1) cu.yd. (Fireman or Diesel - Electric Engineer required)
16	Floating Clamshell, etc. Operator, three (3) cu.yd. and over (Fireman or Diesel - Electric Engineer required)
10	Jack Operator, elevating barges
	Barge Operator, self-unloading (Assistant to Engineer required)
13	Floating Crane (Derrick Barge) Operator, less than thirty (30) ton (Assistant to Engineer required)
16	Floating Crane (Derrick Barge) Operator, thirty (30) ton but less than eighty (80) ton (Assistant to Engineer)
17	Floating Crane (Derrick Barge) Operator, eighty (80) ton but less than one-hundred fifty (150) ton (Assistant to Engineer and Deckhand required)
18	Floating Crane, one-hundred fifty (150) ton but less than two-hundred fifty (250) ton (Assistant to Engineer and Deckhand required)
19	Floating Crane, two-hundred fifty (250) ton and over (Assistant to Engineer and Deckhand required)
	Forklift
1	Self-propelled Scaffolding Operator, construction job site
2	Fork Lift or Lumber Stacker Operator, construction job site
3	Ross Carrier Operator, construction job site
4	Fork Lift Operator, over five (5) ton
15	Rock Hound Operator
4	Lull Hi-Lift Operator or similar type [twenty (20) ft. or over]
	Generators
8	Diesel - Electric Engineer (Generator Operator)
	Heating Plant
2	Temporary Heating Plant Operator
9	Surface Heater and Planer Operator
	Hydraulic Hoes
7	Hydraulic Backhoe Operator, wheel type 3/8 cu.yd. and under with or without front end attachements 2-1/2 cu.yd. and under (Ford, John Deere, Case, type)
9	Hydrualic Backhoe Operator, track type 3/8 cu.yd.
	NOTE: Over 3/8 cu.yd. takes Shovel classification rate

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Loaders
3	Bucket Elevator Loader Operator, Barger Greene and similar types
6	Loaders, rubber-tired type, 2-1/2 cu.yd. and under
7	Elevating Grader Operator, tractor towed requiring operator or grader
8	Belt Loaders, Kolman and Ko Cal types
9	Loader Operator, front end and overhead, 2-1/2 cu.yd. and under 4 cu.yd.
13	Elevating Grader Operator, operated by tractor operator, Sierra, Euclid or similar types
15	Loader Operator, 4 cu.yd. but less than 6 cu.yd.
16	Loader Operator, 6 cu.yd. but less than 8 cu.yd.
16	Loader Operator, 8 cu.yd. but less than 12 cu.yd.
17	Loader Operator, 12 cu.yd. and over
12	Elevating Loader Operator, Athey and similar types
	Oilers
1	Oiler
2	Truck Crane Oiler - Driver, 25 ton or over
2	Auger Oiler
1	Guard Rail Punch Oiler
4	Service Oiler (Greaser)
2	Grade Oiler, required to check grade
2	Grade Checker
	Piledrivers
	NOTE: Crane rates apply when driving or pulling piling.
12	Piledriver Operator (not crane type) (Assistant to Engineeer required)
	Pipeline - Sewer Water
2	Tar Pot Fireman
2	Tar Pot Fireman (power agitated)
3	Hydraulic Pipe Press Operator
4	Hydra Hammer or similar types
4	Pavement Breaker Operator
9	Pipe Cleaning Machine Operator
9	Pipe Doping Machine Operator
9	Pipe Bending Machine Operator
9	Pipe Wrapping Machine Operator
9	Boring Machine Operator (Assistant to Engineer)
13	Back Filling Machine Operator (Assistant to Engineer required)

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Pumps
1	Pump Operator, under 4"
3	Pump Operator, any power, 4" and over
3	Hydrostatic Pump Operator
4	Pump Operator, more than 3 any size
7	Pot Rammer Operator
	Railroad Equipment
1	Brakeman
1	Oiler
3	Motorman
4	Locomotive Operator, under 40 tons (Assistant to Engineer required)
3	Ballast Jack Tamper Operator
7	Ballast Regulator Operator
7	Ballast Tamper Multipurpose Operator
7	Track Liner Operator
7	Tie Spacer Operator
7	Shuttle Car Operator
7	Locomotive Operator, 40 tons and over (Assistant to Engineer required)
1	Switchman
	Remote Control
19	Remote Controlled Earth Moving Equipment (no one operator shall operate more than two pieces of earth-moving equipment at one time)
	Repairmen, H. D.
2	H. D. Repairman Helper
2	Welders Helper
1	Parts Man (Tool Room)
8	Diesel - Electric Engineer (Plant or Floating)
9	Bolt Threading Machine Operator
9	Drill Doctor (Bit Grinder)
9	H. D. Mechanic
9	H. D. Welder
10	Combination H. D. Mechanic-Welder, when dispatched and/or when required to do both
10	Welder - Certified, when dispatched and/or required
9	Machine Tool Operator
	Rubber-Tired Scrapers
12	Rubber-Tired Scraper Operator, single engine, single scraper

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Rubber-Tired Scrapers - contd.
12	Self-Loading, paddle wheel ladder type
12	Rubber-Tired Scraper Operator, twin engine
12	Rubber-Tired Scraper Operator, with push-pull attachments
14	Rubber-Tired Scraper Operator, with tandem scrapers
16	Rubber-Tired Scraper Operator, with tandem scrapers, multiengine
	Shovel, Dragline, Clamshell, Backhoe, Skooper, etc., Operator
1	Oiler
1	Guard Rail Punch Oiler
2	Grade Oiler, (required to check grade)
2	Grade Checker
2	Fireman
8	Diesel-Electric Engineer
9	Stationary Drag Scraper Operator
11	Shovel, Dragline, Clamshell, Hoe, etc., Operator, under 1 cu.yd. (Assistant to Engineer required)
11	Gradeall Operator, under 1 cu.yd. (Assistant to Engineer required)
16	Shovel, etc., 3 cu.yd. but less than 5 cu.yd. (Assistant to Engineer required)
13	Gradeall, 1 cu.yd. and over (Assistant to Engineer required)
17	Shovel, etc., 5 cu.yd. and over (Assistant to Engineer required)
	Signalman
3	Bell Boy, Phones, etc., Operator
2	Helicopter Radioman (ground)
	Surfacing (Base) Material
2	Roller Operator, rock
4	Roller Operator, oiling, CTB.
3	Tamping Machine Operator, mechanical self-propelled
3	Hydrographic seeder Machine Operator, straw, pulp or seed
6	Rock Spreader, self-propelled
12	Blade Mounted Spreaders, Ulrich and similar types
5	Chip Spreading Machine Operator
5	Lime Spreading Operator, construction job site
	Sweepers
3	Broom Operator, self-propelled, construction job site
5	Sweeper Operator (Wayne type) self-propelled, construction job site

HOISTING AND PORTABLE ENGINEERS' GROUP CLASSIFICATION - contd.

Group	Tractor - Rubber-Tired
5	Tractor Operator, rubber-tired 50 H.P. Flywheel and under
9	Tractor Operator, rubber-tired over 50 H.P. Flywheel
9	Tractor Operator, rubber-tired with boom attachment
10	Rubber-Tired Dozers and Pushers (Michigan, Cat, Hough type)
	Trenching Machines
1	Oiler
2	Grade Oiler (required to check grade)
5	Trenching Machine Operator, maximum digging capacity 3 ft. depth (any assistance in the operation shall be performed by any assistant to Engineer)
9	Trenching Machine Operator, maximum digging capacity over 3 ft. depth (Grade Oiler required)
13	Back Filling Machine Operator (Assistant to Engineer)
16	Wheel Excavator, under 750 cu.yd. per hour (Grade Oiler required)
17	Canal Trimmer (Grade Oiler required)
18	Wheel Excavator, over 750 cu.yd. per hour (Two operators and at least one Grade Oiler required)
18	Band Wagons (in conjuction with wheel excavator)
	Tunnel
11	Mucking Macine Operator
12	Shield Operator
3	Air Filtration Equipment Operator
	Welding Machines
3	Welding Machine Operator
	Underwater Equipment
19	Underwater Equipment Operator, remote or otherwise, when used in construction work

LABORERS - Heavy, Highway, Utility and Building Construction Work

Group I	Effective 6-1-70 to 6-1-71
Includes General Laborers and the following:	$4.85
Asphalt Plant Laborers	
Asphalt Spreaders	
Batch Weighmen	
Broomers	
Brush Burners and Cutters	

LABORERS - Heavy, Highway, Utility and Building Construction Work - contd.

Group I - contd. — Effective 6-1-70 to 6-1-71

Car and Truck Loaders	$4.85
Carpenter Tender	
Change-House Man or Dry Shack Man	
Choker Setters	
Clean Up Laborers	
Concrete Laborers	
Crusher Feeders	
Culvert, Hand Labor	
Curing, Concrete	
Demolition, Wrecking, and Moving Laborers	
Driller Helpers	
Dumpers, road oiling crew	
Dumpmen (for grading crew)	
Elevator Feeders	
Fence Builder (Including Guard Rail, Median Rail, Reference Post, Guide Post, Right-of-Way Marker)	
Fine Graders	
Flagmen, Traffic	
Form Strippers (not swinging stages)	
Landscaping or Planting Laborers	
Leverman on Aggregate Spreader (Flaharty and similar types)	
Loading Spotters	
Material Yard Man (including electrical)	
Powderman Helper	
Pittsburgh Chipper Operator or similar types	
Railroad Track Laborers	
Ribbon Setters (including steel forms)	
Riprap Man (hand placed)	
Road Pump Tender	
Sewer Labor	
Signalman	
Skipmen	
Slopers	
Spraymen	
Stake Chaser-Stake Setter-Grade Checker	
Stockpiler	
Timber Faller and Bucker (hand labor)	
Toolroom Man (at job site)	
Tunnel Bull Gang (above ground)	
Weigh Man-Crusher Aggregate (when used)	

Group II — Effective 6-1-70 to 6-1-71

Applicator (including Pot Tender for same), applying protective material by hand or nozzle on utility lines or storage tanks on project	$5.00
Burners	
Choker Splicer	

LABORERS - Heavy, Highway, Utility and Building Construction Work - contd.

Group II - contd. Effective 6-1-70 to 6-1-71

Clary Power Spreader and similar types	$5.00
Clean Up Nozzlemen-Greencutter (concrete Rock, etc.)	
Concrete Power Buggyman	
Demolition and Wrecking Charred Materials	
Gunite Nozzleman Tender	
Gunite or Sand Blasting Pot Tender	
Handlers or Mixers of all insulating material of an irritating nature (including cement and lime)	
Power Tool Operators, includes but not limited to:	
Jackhammer	
Chipping Guns	
Paving Breakers	
Vibrators (less than 4" in diameter)	
Post Hole Digger, Air, Gas or Electric	
Vibrating Screed	
Tampers	
Ribbon Setter, head	
Riprap Man (head, hand placed)	
Sand Blasting (wet)	
Sewer Timberman	
Timber Buckers and Fallers, Brush Cutters (power saw)	
Tunnel-Muckers, Brakemen, Concrete Crew, Bull Gang (underground)	

Group III Effective 6-1-70 to 6-1-71

Asphalt Rakers	$5.15
Bit Grinder	
Drill Doctor	
Drill Operators, Air Tracks, Cat Drills, Wagon Drills, Rubber-Mounted Drills, and other similar types	
Concrete Saw Operator	
Gunite Nozzleman	
High Scalers, Strippers and Drillers (cover work in swinging stages, chairs or belts under extreme conditions unusual to normal drilling, blasting, barring-down, or sloping and stripping)	
Powdermen	
Power Saw Operators (bucking and falling merchantable logs)	
Pumpcrete Nozzleman	
Sand Blasting (dry)	
Sewer Pipe Layers	
Track Liners, Anchor Machines, Ballast Regulators, Multiple Tampers, Power Jacks	
Tugger Operator	
Tunnel--Chuck Tenders, Nippers, and Timbermen	
Vibrators (4" and larger)	

LABORERS - Heavy, Highway, Utility and Building Construction Work - contd.

Group III - contd. Effective 6-1-70 to 6-1-71

Water Blaster	$5.15
Welder	
Tunnel Miners	
Tunnel Powdermen	

Any Laborers working in live sewers shall receive $5.00 per day in addition to his regular pay.

Group IV Effective 6-1-70 to 6-1-71

Tunnel Miners	$5.30
Tunnel Powderman	

LABORERS FRINGE BENEFITS

H & W	Pension	Vacation	Training	Industry Fund
$.35	.40	.10	.02	.03

TEAMSTERS - Building and Highway and Heavy Construction Work
Effective 6-1-70 to 6-1-71

A-Frame or Hydra-lift Truck w/load bearing surface	$5.53
Battery Rebuilder	5.48
Bus or Man-haul Driver	5.48
Concrete Buggies (power operated)	5.48
Drivers & Helpers handling sacked cement add 15¢ per hour	
Dump Truck, side, end and bottom dumps, incl. semitrucks and trains or combinations thereof:	
6 cu.yd. & under	5.48
Over 6 cu.yd. & inc. 10 cu.yd.	5.58
Over 10 cu.yd. & inc. 20 cu.yd.	5.78
Over 20 cu.yd. & inc. 30 cu.yd.	5.88
Over 30 cu.yd. & inc. 40 cu.yd.	5.98
Over 40 cu.yd. & inc. 50 cu.yd.	6.08
Over 50 cu.yd. & inc. 60 cu.yd.	6.25
Over 60 cu.yd. & inc. 70 cu.yd.	6.35
Over 70 cu.yd. & inc. 80 cu.yd.	6.45
Over 80 cu.yd. & inc. 90 cu.yd.	6.55
Over 90 cu.yd. & inc. 100 cu.yd.	6.65
Dumpsters or similar equipment - all sizes	5.68
Flaherty Spreader Driver or Leverman	5.63
Lift Jitneys, Fork Lifts - all sizes - used in loading, unloading and transporting material on job site	5.48
Loader and/or Leverman on concrete dry batch plant, manually operated	5.48
Low Bed Equipment, Flat Bed Semitrailer, Truck and Trailer or Doubles transporting equipment or wet or dry materials	5.63

TEAMSTERS - Building and Highway and Heavy Construction Work - contd.

Effective 6-1-70 to 6-1-71

Lubrication Man, Fuel Truck Driver, Tiremen, Wash Rack, Steam Cleaner Combination	5.53
Lumber Carrier Driver-straddle carrier--used in loading, unloading and transporting of materials on job site	5.63
Oil Distributor Driver or Leverman	5.63
Pilot Car	5.48
Slurry Truck Driver or Leverman	5.58
Solo Flat Bed and Misc. Body Trucks 0-10 tons	5.48
Transit Mix and Wet or Dry Mix Trucks:	
5 cu.yd. and under	5.58
Over 5 cu.yd. & inc. 7 cu.yd.	5.68
Over 7 cu.yd. & inc. 9 cu.yd.	5.78
Over 9 cu.yd. & inc. 11 cu.yd.	5.88
Over 11 cu.yd. & inc. 13 cu.yd.	5.98
Over 13 cu.yd. & inc. 15 cu.yd.	6.08
Team Drivers	5.53
Tireman, full-time basis	5.58
Truck Helper	5.48
Truck Mechanic-welder-body repairman	5.78
Truck Mechanic Helper	5.48
Warehouseman (warehouse parts, tool men and parts chaser, checkers and receivers)	5.48
Water Wagons (rated capacity)	
Up to 1600 gallons	5.48
1600 to 3000 gallons	5.58
3000 to 5000 gallons	5.63
5000 to 7000 gallons	5.78
7000 to 10,000 gallons	5.88
10,000 to 15,000 gallons	5.98
Winch Truck--takes classification of truck on which winch is mounted	

TEAMSTERS FRINGE BENEFITS

H & W	Pension	Vacation	Industry Fund
$.30	.30	.05	.02

ORS 279.316 Condition concerning hours of labor.

Every public contract shall also contain a condition that no person shall be employed for more than eight hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the laborer shall be paid at least time and a half pay for all overtime in excess of eight hours a day and for work performed on Saturday and on any legal holiday specified in ORS 187.010, except Veterans Day. However, when specifically agreed to under a written labor-management negotiated labor agreement, a laborer may be paid at least time and a half pay for work performed on Veterans Day or on any legal holiday specified in ORS 187.020.
(Amended by 1967 c.167 §1)

ORS 279.334 Maximum hours of labor on public contracts.

In all cases where labor is employed by the state, county, school district, municipality, municipal corporation, or subdivision, through a contractor, no person shall be required or permitted to labor more than eight hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency, or where the public policy absolutely requires it, in which event, the person or persons so employed for excessive hours shall receive at least time and a half pay for all overtime in excess of eight hours a day, and for work performed on Saturday and on any legal holiday specified in ORS 187.010, except Veterans Day. However, when specifically agreed to under a written labor-management negotiated labor agreement, a laborer may be paid at least time and a half pay for work performed on Veterans Day or on any legal holiday specified in ORS 187.020. This section shall not apply to labor performed in the prevention or suppression of fire under contracts and agreements made pursuant to the authority of the State Forester or State Board of Forestry, under ORS 477.406.
(Amended by 1963 c.241 §1; 1967 c.167 §2)

ORS 187.010 Legal holidays; acts deferred to next business day.

(1) The following days are legal holidays in this state:
(a) Each Sunday.
(b) New Year's Day on January 1.
(c) Memorial Day on May 30.
(d) Independence Day on July 4.
(e) Labor Day on the first Monday in September
(f) Veterans Day on November 11.
(g) Thanksgiving Day on the fourth Thursday in November.
(h) Christmas Day on December 25.
If any of such holidays, other than Sunday, at any time fall on Sunday, the succeeding Monday shall be a holiday in that year.
(2) Any act authorized, required or permitted to be performed on a holiday as designated in this section may be performed on the next succeeding business day; and no liability or loss of rights of any kind shall result from such delay.
(Amended by 1955 c.4 §1)

ORS 187.020 Additional legal holidays.

In addition to those specified in ORS 187.010, the following days are legal holidays in this state:
(1) Lincoln's Birthday on February 12.
(2) Washington's Birthday on February 22.
(3) Every day on which an election is held throughout the state.
(4) Every day appointed by the President of the United States or by the Governor as a holiday.
If any of such holidays at any time fall on Sunday, the succeeding Monday shall be a holiday in that year.

Prevailing Journeyman Wage Rates in Oregon
for Specialty Building Trades

as determined by the Commissioner of Labor
pursuant to ORS 279.348 thru 279.356, and
ORS 369, 1969

The following prevailing journeyman wage rates, including fringe benefits, apply to the specialty construction trades in Newberg, Oregon, and vicinity, as of 6 July 1970, and for the effective period designated by the Commissioner of Labor:

Craft Classification	Minimum Rate Per Hour Including Fringe Benefits
Plumbers	
Journeymen	Not Available

In the event it is necessary to employ workmen in a classification not listed, the Contractor shall make application to the Commissioner of Labor for the determination of the prevailing wage rate for such workmen. If a dispute arises as to what is the prevailing wage rate for any class of workmen, and, if the dispute cannot be settled by the parties involved, it may be referred to the Commissioner of Labor, State of Oregon, for final determination.

In some cases the minimum wage rates for certain crafts are not available at this time. The Contractor, in making a bid, hereby agrees to pay not less than the minimum wage rates established by the governmental agency having jurisdiction over the wage rates for these crafts.

The Owner does not guarantee that labor can be procured for the wages set forth in the above Prevailing Journeyman Wage Rates. The rates of wages listed are minimum only, below which the Contractor cannot pay, and they do not constitute a representation that labor can be procured for the minimum listed.

****

OREGON

PUBLIC WORKS CONTRACTOR WAGE CERTIFICATION

NAME AND ADDRESS OF CONTRACTOR OR SUBCONTRACTOR	DATE OF CERTIFICATION
	CERTIFICATE FOR PERIOD ENDING

DESCRIPTION AND LOCATION OF WORK

INSTRUCTIONS:

1. Oregon Law (ORS 279.348 - 279.356) specifies that no payment may be made on public work contracts unless the contractor or subcontractor, or surety, provides a certificate stating the hourly rate of wages paid to the workmen; and also certifying that such rate is not below the prevailing rates for the locality as determined by the Commissioner of the Bureau of Labor. This form is required in making such certification.
2. Submit this completed form in duplicate before the first payment, each time the prevailing wage rate changes, and before the final payment. (Note: Prevailing rates generally change on July 1 of each year.)
3. List below each craft employed by you and the hourly rate paid. It is not necessary to list each employe. Supervisory and office personnel or other workmen on regular monthly or per diem salary need not be listed.
4. Complete the affidavit on this form and have it notarized.

TRADE OR OCCUPATION CLASSIFICATION	BASIC HOURLY RATE	FRINGE BENEFITS PAYMENTS				
		H&W	PENSIONS	VAC. & HOLIDAY	APP. OR TR.	OTHERS

ADDITIONAL SPACE ON BACK

TRADE OR OCCUPATION CLASSIFICATION	BASIC HOURLY WAGE	FRINGE BENEFITS PAYMENTS				
		H&W	PENSIONS	VAC. & HOLIDAY	APP. OR TR.	OTHERS

APPRENTICE NAME	TRADE	PERIOD	BASIC HOURLY WAGE	H&W	PENSIONS	VAC. & HOLIDAY	APP. OR TR.	OTHERS

OVERTIME PROVISIONS

Before payment is made of any sum due on account of a contract for a public work, the state treasurer or the treasurer of the county, city, district, authority, public corporation or entity or of any of their instrumentalities organized and existing under charter or law, or other officer charged with the disbursement of funds applicable to the contract under and pursuant to which payment is made, shall require the contractor or his surety and every subcontractor or his surety to file a statement in writing in form prescribed by the State Labor Commissioner, certifying the hourly rate of wage paid each classification of workmen employed by him upon such public work, and further certifying that no workman employed by him upon such public work has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract, which certificate and statement shall be verified by the oath of the contractor or his surety or subcontractor or his surety that he has read such statement and certificate and knows the contents thereof and that the same is true to his knowledge.

AFFIDAVIT

Being first duly sworn, I hereby certify that the hourly rate of wages shown on this form was paid each classification of workmen employed by me (my principal) upon the public work project specified above. I further certify that no workmen employed by me (my principal) upon said public work has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract for said public work. I have read this statement and certificate and know the contents thereof and the same is true to my knowledge.

SIGNATURE | TITLE

☐ CONTRACTOR ☐ SUBCONTRACTOR ☐ CONTRACTOR'S SURETY ☐ SUBCONTRACTOR'S SURETY

SUBSCRIBED AND SWORN TO BEFORE ME

NOTARY PUBLIC

DATED | COMMISSION EXPIRES

GENERAL CONDITIONS

A. DEFINITIONS

A-1. Contract Documents. The "Contract Documents" consist of the Advertisement for Bids, the Proposal, the Contract, the Performance Bond, the Information for Bidders, the Special Provisions, the General Conditions, the Specifications, and the Plans, including all modifications thereof incorporated into the Documents before their execution. These form the Contract.

A-2. Owner, Contractor, Bidder. The "Owner," "Contractor," and "Bidder" are those named as such in the Contract Documents.

A-3. Engineer. Wherever the word "Engineer" occurs in these Contract Documents, the word shall signify the firm of Cornell, Howland, Hayes & Merryfield, which has been designated by the Owner to be the Engineer for the work.

A-4. Written Notice. The term "Written Notice" shall signify a written communication delivered in person or by certified or registered mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or registered mail shall be addressed to the last business address known to him who gives the notice.

A-5. Work. The word "Work" within these Contract Documents shall include all material, labor, tools, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract, and such additional items not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good practice to provide a complete and satisfactory system or structure.

Jul.'70

B. CONTRACT DOCUMENTS

B-1. Intent of Contract Documents. The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intent of the Documents is to include all work (except specific items to be furnished by the Owner), necessary for completion of the Contract. Materials or work described in words which so applied have a well-known technical and trade meaning shall be held to refer to such recognized standards.

B-2. Discrepancies and Omissions. Any discrepancies or omissions found in the Contract Documents shall be reported to the Engineer immediately. The Engineer will clarify discrepancies or omissions, in writing, within a reasonable time.

In resolving inconsistencies among two (2) or more sections of the Contract Documents, precedence shall be given in the following order:

Contract
Special Provisions
General Conditions
Special Specifications
Plans
Standard Specifications

Figure dimensions on Plans shall take precedence over scale dimensions; detailed Plans shall take precedence over general Plans.

B-3. Alterations. The Owner, without invalidating the Contract, may order extra work or make changes by altering, adding to, or deducting from the work, the Contract being adjusted accordingly. All such work shall be executed under the conditions of the original Contract, except as specifically adjusted at the time of ordering such change.

In giving instructions, the Engineer may order minor changes in the work not involving extra cost and not inconsistent with the purposes of the structure; but otherwise, except in an emergency endangering life or property, extra work or deductions from the work shall be performed only in pursuance of a written order from the Owner, signed or countersigned by the Engineer, or a written order from the Engineer stating that the Owner has authorized the deduction, extra work, or change; and no claim for additional payment shall be valid unless so ordered.

If the work is reduced by alterations, such action shall not constitute a claim for damages based on loss of anticipated profits.

B-4. Verification and Warranty. The Contractor shall determine the nature and location of the work, the general and local conditions, and all other matters which can in any way affect the work under this Contract. Failure to make an examination necessary for this determination shall not release the Contractor from the obligations of this Contract. The Contractor warrants that no verbal agreement or conversation with any officer, agent, or employee of the Owner, either before or after the execution of this Contract, has affected or modified any of the terms or obligations herein contained.

B-5. Copies to be Kept on the Work. The Contractor shall keep one (1) copy of the Contract Documents on the work, in good order, available to the Engineer and to his representatives.

B-6. Copies to be Furnished. The Engineer will furnish to the Contractor, on request and free of charge, six (6) copies of the Contract Documents and six (6) sets of full-size Plans or a sepia of the tracings. Additional copies of Contract Documents or Plans may be obtained on request by paying the actual cost of reproducing the Contract Documents or Plans.

B-7. Ownership of Drawings. All Plans, Drawings, Specifications, and copies thereof furnished by the Engineer are his property. They are not to be used on other work and, with the exception of the signed Contract set, are to be returned to him on request at the completion of the work. All models are the property of the Owner.

C. THE ENGINEER

C-1. Authority of the Engineer. The Engineer shall be the Owner's representative during the construction period. His authority and responsibility shall be limited to the provisions set forth in these Contract Documents. The Engineer shall have the authority to reject all work and materials and to stop the work whenever such rejection and/or stoppage may be necessary to insure execution of the Contract in accordance with the intent of the Contract Documents.

C-2. Duties and Responsibilities of the Engineer. The Engineer shall make periodic visits to the site of the project to observe the progress and quality of the work and to determine, in general, if the work is proceeding in accordance with the intent of the Contract Documents. He shall not be required to make comprehensive or continuous inspections to check quality or quantity of the work, and he shall not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work. Visits and observations made by the Engineer shall not relieve the Contractor of his obligation to conduct comprehensive inspections of the work and to furnish materials and perform acceptable work, and to provide adequate safety precautions, in conformance with the intent of the Contract.

The Engineer shall make decisions, in writing, on all claims of the Owner or the Contractor arising from interpretation or execution of the Contract Documents. Such decision shall be necessary before the Contractor can receive additional money under terms of the Contract. Changes in work or extra work ordered by the Engineer shall be made in compliance with Article B-3 of the General Conditions.

One or more inspectors may be assigned to observe the work and to act in matters of construction under this Contract. It is understood that such inspectors shall have the power to issue instructions and make decisions within the limitations of the authority of the Engineer. Such inspection shall not relieve the Contractor of his obligations to conduct comprehensive inspections of the work and to furnish materials and perform acceptable work, and to provide adequate safety precautions, in conformance with the intent of the Contract.

C-3. Rejected Material. Any material condemned or rejected by the Engineer or his authorized inspector because of nonconformity with the Contract Documents shall be removed at once from the vicinity of the work by the Contractor at his own expense, and the same shall not be used on the work.

C-4. Unnoticed Defects. Any defective work or material that may be discovered by the Engineer before the final acceptance of work, or before final payment has been made, or during the guarantee period, shall be removed and replaced by work and materials which shall conform to the provisions of the Contract Documents. Failure on the part of the Engineer to condemn or reject bad or inferior work or materials shall not be construed to imply acceptance of such work or materials.

C-5. Right to Retain Imperfect Work. If any part or portion of the work done or material furnished under this Contract shall prove defective and not in accordance with the Plans and Specifications, and if the imperfection in the same shall not be of sufficient magnitude or importance as to make the work dangerous or undesirable, or if the removal of such work will create conditions which are dangerous or undesirable, the Owner shall have the right and authority to retain such work but shall make such deductions in the final payment therefor as may be just and reasonable.

C-6. Lines and Grades. Lines and grades shall be established as provided in the Special Provisions. The Contractor shall make every effort to notify the Engineer at least three (3) days in advance of the time when the line and grade will be needed. The Contractor will not be allowed extensions of time because of delays caused by insufficient line and grade. All stakes, marks, and other information shall be carefully preserved by the Contractor; and in cases of their careless or unnecessary destruction or removal by him or his employees, such stakes, marks, and other information shall be replaced by the Engineer at the Contractor's expense. The Contractor shall be responsible for the transfer to the structure of the lines and grades as set by the Engineer.

C-7. Shop Drawings. The Contractor shall submit, in quadruplicate, to the Engineer for his review, such shop drawings and/or catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Drawings shall be submitted in sufficient time to allow the Engineer not less than ten (10) regular working days for examining the drawings.

These drawings shall be accurate, distinct, and complete, and shall contain all required information, including satisfactory identification of items, units, and assemblies in relation to the Contract drawings and Specifications.

Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings, or other approved means, that he (the Contractor) has checked the shop drawings, and that the work shown is in accordance with Contract requirements and has been checked for dimensions and relationship with work of all other trades involved. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable; and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the Contract Documents and will be returned to the Contractor for resubmission in the proper form.

When the shop drawings have been reviewed by the Engineer, two (2) sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one (1) set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit the drawings, in quadruplicate, unless otherwise directed by the Engineer. No changes shall be made by the Contractor to resubmitted shop drawings other than those changes indicated by the Engineer.

The review of such drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for correctness of dimensions, fabrication details and space requirements, or for deviations from the Contract drawings or Specifications, unless the Contractor has called attention to such deviations in writing by a letter accompanying the drawings and the Engineer approves the change or deviations in writing at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the Engineer, the Contractor shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.

C-8. Detail Drawings and Instructions. The Engineer will furnish, with reasonable promptness, additional instructions by means of drawings or otherwise, if, in the Engineer's opinion, such are required for the proper execution of the work. All such drawings and instructions will be consistent with the Contract Documents, true developments thereof, and reasonably inferable therefrom.

D. THE CONTRACTOR AND HIS EMPLOYEES

D-1. Subcontracting. The Contractor shall, as soon as practicable after the execution of the Contract, notify the Engineer, in writing, of the names of the subcontractors proposed for the principal parts of the work and for such others as the Engineer may direct, and shall not employ any that the Engineer may within a reasonable time object to as lacking the capability to properly perform work of the type and scope specified.

The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his subcontractors and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Owner.

D-2. Performance Bond. The Contractor shall furnish a surety bond of the form included herewith, in an amount at least equal to the total amount of the Proposal, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the construction of the work, and to cover all guarantees against defective workmanship or materials, or both, for a period of one (1) year after the date of final acceptance of the work by the Owner. Said bond shall be issued by a surety company authorized to issue such bonds in the State of Oregon and must, in all respects, be satisfactory and acceptable to the Owner.

D-3. Insurance. The Contractor shall provide the insurance coverage designated hereinafter and pay all costs.

a. Contractor's and Subcontractor's Insurance. The Contractor shall not commence work under this Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on

his subcontract until all similar insurance required of the subcontractor has been so obtained and approved. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.

b. Compensation and Employer's Liability Insurance. The Contractor shall take out and maintain during the life of this Contract the statutory Workmen's Compensation and Employer's Liability Insurance for all of his employees to be engaged in work on the project under this Contract and, in case any such work is sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation and Employer's Liability Insurance for all of the latter's employees to be engaged in such work.

c. Public Liability and Property Damage Liability Insurance. The Contractor shall take out and maintain during the life of this Contract such Public Liability and Property Damage Liability Insurance and Automobile Public Liability and Property Damage Liability Insurance as shall protect him, the Owner, the Engineer, and any subcontractor performing work covered by this Contract from claims for damages for personal injury, including accidental death, as well as from claims for property damage, which may arise from operations under this Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them, and the amounts of such insurance shall be not less than:

(1) Public Liability Insurance in an amount not less than One Hundred Thousand Dollars ($100,000.00) for injuries, including wrongful death to any one person, and subject to the same limit for each person in an amount not less than Three Hundred Thousand Dollars ($300,000.00) for each occurrence.

(2) Property Damage Liability Insurance in an amount not less than One Hundred Thousand Dollars ($100,000.00) for damages for each occurrence.

The Contractor's Public Liability Insurance and Property Damage Liability Insurance shall provide the primary coverage on all claims arising out of the performance of the Contract, and shall name the Owner, its officers, agents, and employees, and the Engineer as additional named insureds therein.

d. State Highway Department Insurance Coverage. When the construction is to be accomplished within the right-of-way of the Oregon State Highway Department or on lands over which they have direct or indirect control, the Contractor's Liability Insurance Policy shall contain the following endorsement:

"The State of Oregon, the State Highway Commission and members thereof, its officers, agents, and employees are hereby included as named insureds in the herein numbered policy, except as to claims against the primary named insured for injury to their persons or damage to any of its or their property.

"Cancellation of this endorsement or of the policy to which it is attached may be effected by agreement of the parties hereto, or by the company or the primary named insured giving not less than thirty (30) days' notice in writing and by certified mail to the Director of Permits, Room 121, State Highway Building, Salem, Oregon; said notice to commence to run from the date notice is actually received at said office.

"The limits of liability of the company for the operations of the insured in construction operations on the right-of-way of State Highways shall be as follows:

Bodily Injury Liability ----	Each Person ------	$100,000
	Each Accident ----	$300,000
Property Damage Liability --	Each Occurrence --	$100,000

"Limits provided herein are the minimum limits required by the Oregon State Highway Commission and shall in no way be considered a reduction in limits as originally provided in this policy."

e. Fire Insurance. Fire insurance coverage shall be provided as set forth in the Special Provisions.

f. Certificates of Insurance. Before commencing work under this Contract, Contractor shall furnish the Owner with certificates of insurance specified herein showing the type, amount, class of operations covered, effective dates, and date of expiration of policies, and containing substantially the following statement:

"The insurance covered by this certificate will not be cancelled or materially altered, except after ten (10) days' written notice has been received by the Owner."

D-4. Permits and Licenses. The Contractor shall keep himself fully informed of all local ordinances, State and Federal laws in any manner affecting the work herein specified. He shall at all times comply with said ordinances, laws, and regulations, and protect and indemnify the Owner and its officers and agents against any claim or liability arising from or based on the violation of any such laws, ordinances, or regulations. All permits, licenses, and inspection fees necessary for prosecution and completion of the work shall be secured and paid for by the Contractor, unless otherwise specified.

D-5. Superintendence. The Contractor shall keep on the work, during its progress, competent supervisory personnel. The Contractor shall give efficient supervision to the work, using his best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, and procedures, and for providing adequate safety precautions and coordinating all portions of the work under the Contract.

D-6. Reception of Engineer's Directions. The superintendent, or other duly authorized representative of the Contractor, shall represent the Contractor and all directions given to him by the Engineer shall be binding. Such directions of major importance will be confirmed in writing. Any direction will be so confirmed in each case on written request from the Contractor.

D-7. Sanitation. Sanitary conveniences shall be erected and maintained by the Contractor at all times while men are employed on the work; and the use of such sanitary conveniences shall be strictly enforced. The location of such conveniences shall be approved by the Engineer.

D-8. Employees. The Contractor shall employ only competent, skillful men to do the work; and whenever any person shall appear to be incompetent or to act in a disorderly or improper manner, such person shall be removed from the work.

D-9. Requirements of Oregon Law for Public Contracts. When the Contract Documents concern public works of the State or any County, municipality, or political subdivision created by its laws, the applicable statutes of the State of Oregon shall apply. For this reason Sections 279.310 through 279.356 of the Oregon Revised Statutes, as amended or superseded, including the latest additions and revisions, are incorporated by reference as parts of these Contract Documents.

These sections define the requirements of Oregon law for public contracts:

a. Concerning payment of laborers and materialmen, contributions to Workmen's Compensation Board, preventions of liens, payment of withholding taxes.

b. Concerning the maximum hours of labor, payment of not less than the prevailing rate of wages, payment of medical care and attention to employees, certification of wages by contractors and subcontractors, liability to workmen for violation of minimum wage rate requirements.

c. Concerning payment of claims by public officers, termination of Contract because of a national emergency, conditions concerning the forfeiture of Contract.

It is understood and agreed that all parties to this Contract shall determine the contents of these applicable statutes and comply with their provisions throughout the performance of the Contract.

D-10. Safety Precautions. The Contractor shall take all necessary precautions for the safety of employees on the work and shall comply with all applicable provisions of Federal, State, and municipal safety laws and building codes to prevent accidents or injury to persons on, about, or adjacent to the premises where the work is being performed. The Contractor shall, without further order, provide and maintain at all times during the progress or temporary suspension of the work, suitable barricades, fences, signs, signal lights, and flagmen as are necessary or required to insure the safety of the public and those engaged in the work. The operations of the Contractor, for the protection of persons, and the guarding against hazards from machinery and equipment, shall meet the requirements of the applicable State laws and the current safety regulations as set forth in the Oregon Safety Codes adopted and published by the Workmen's Compensation Board, Salem, Oregon.

The Contractor shall be solely and completely responsible for condition of the premises on which the work is performed and for safety of all persons and property on the site during performance of the Contract. This requirement shall not be limited to normal working hours, but shall apply continuously. The Contractor shall conform with all governing safety regulations.

D-11. Protection of Property.

a. Protection of Work and Property. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Contract. He shall at all times safely guard and protect his own work, and that of adjacent property (as provided by law and the Contract Documents) from damage. All passageways, guard fences, lights, and other facilities required for protection by State or municipal laws and regulations and local conditions, must be provided and maintained.

b. Responsibility of Contractor to Act in Emergency. In case of an emergency which threatens loss or injury of property, and/or safety of life, the Contractor shall act, without previous instructions from the Owner or Engineer, as the situation may warrant. He shall notify the Engineer thereof immediately thereafter. Any compensation claimed by the Contractor, together with substantiating documents in regard to expense, shall be submitted to the Owner through the Engineer and the amount of compensation shall be determined by agreement or arbitration.

D-12. Materials and Appliances. Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

D-13. Access for Inspection. The Contractor shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the Engineer. When required, the Contractor shall furnish certificates of tests of materials and equipment made at the point of manufacture by a recognized testing laboratory.

The Engineer and his representatives shall at all times have access to the work wherever it is in preparation or progress, and the Contractor shall provide facilities for such access and for inspection, including maintenance of temporary and permanent access.

If the Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give timely notice of its readiness for inspection. Inspections to be conducted by the Engineer will be promptly made, and where practicable, at the source of supply. If any work should be covered up without approval or consent of the Engineer, it shall, if required by the Engineer, be uncovered for examination at the Contractor's expense.

Re-examination of questioned work may be ordered by the Engineer; and, if so ordered, the work shall be uncovered by the Contractor. If such work be found in accordance with the Contract Documents, the Owner will pay the cost of re-examination and replacement. If such work be found not in accordance with the Contract Documents, the Contractor shall correct the defective work at no additional cost to the Owner.

D-14. Royalties and Patents. The Contractor shall pay all royalty and license fees, unless otherwise specified. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner and the Engineer harmless from loss on account thereof.

D-15. Indemnity. The Contractor shall indemnify, save harmless, and defend the Owner and the Engineer from and against all costs, expenses, and losses and all claims, demands, payments, suits, actions, recoveries, and judgments of every nature and description made, brought, or recovered against the Owner by reason of any act or omission of the Contractor, his agents or employees, in the execution of the work or in guarding the same.

D-16. Taxes and Charges. The Contractor shall withhold and pay any and all withholding taxes, whether State or Federal; and pay all Social Security charges and also all State Unemployment Compensation charges; and pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees or sums whatsoever, which are now or may hereafter be required to be paid or withheld under any laws.

D-17. Unforeseen Difficulties. The Contractor shall protect his work and materials from damage due to the nature of the work, the elements, carelessness of other contractors, or from any cause whatever until the completion and acceptance of the work. All loss or damages arising out of the nature of the work to be done under these Contract Documents, or from any unseen obstruction or defects which may be encountered in the prosecution of the work, or from the action of the elements shall be sustained by the Contractor.

D-18. Contractor's Right to Stop Work or Terminate Contract. If the work should be stopped under an order of any court or other public authority for a period of three (3) months, through no act or fault of the Contractor or of anyone employed by him; or if the Engineer should fail to issue any estimate for payment within fifteen (15) days after it is due; or if the Owner should fail to pay the Contractor within thirty (30) days after the time specified in Article F-1 of these General Conditions any sum certified by the Engineer, then the Contractor may, upon fifteen (15) days' written notice to the Owner and the Engineer, stop work or terminate this Contract and recover from the Owner payment for all work executed and any loss sustained upon any plant or material and reasonable profit, unless said default has been remedied within said time.

D-19. Correction of Defective Work After Final Acceptance. All work, including the design of mechanical and electrical components of equipment and/or design of packaged control systems which are furnished as a component of equipment, shall be guaranteed for a period of one (1) year against defects in materials and workmanship. The Contractor hereby agrees to make, at his own expense, all repairs or replacements necessitated by defects in materials or workmanship supplied by him that become evident within one (1) year after the date of final acceptance of the work. The Contractor also agrees to hold the Owner harmless from liability of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work, and the Contractor and his Surety shall be liable for the cost thereof. Any additional requirements for the project relative to correction of defective work after final acceptance are set forth in the Special Provisions.

E. PROGRESS OF THE WORK

E-1. Beginning of the Work. Before work shall be started and materials ordered, the Contractor shall meet and consult with the Engineer relative to materials, equipment, and all arrangements for prosecuting the work.

E-2. Schedules and Progress Reports. Prior to starting the construction, the Contractor shall furnish the Engineer for his approval, if requested, a schedule or schedules of expected progress of the work under the Contract

showing approximately the dates on which each part or division of the work is expected to be started and finished. The progress schedules shall be submitted regularly and shall cover a time period satisfactory to the Engineer. The Contractor shall also forward to the Engineer, if requested, as soon as practicable after the first day of each month, a summary report of the progress of the various parts of the work under the Contract in the shops and in the field, stating the existing status, rate of progress, estimated time of completion, and cause of delay, if any.

E-3. Prosecution of the Work. It is expressly understood and agreed that the time of beginning, rate of progress, and time of completion of the work are of the essence of this Contract. The work shall be prosecuted at such time, and in or on such part or parts of the project as may be required, to complete the project as contemplated in the Contract Documents and the approved construction schedule.

If the Contractor desires to carry on work at night or outside the regular hours, he shall give timely notice to the Engineer to allow satisfactory arrangements to be made for inspecting the work in progress.

E-4. Assignment. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other; nor shall the Contractor assign any monies due or to become due to him hereunder without the previous written consent of the Owner.

E-5. Owner's Right to Do Work. If the Contractor should, in the opinion of the Engineer, neglect to prosecute the work properly or should neglect or refuse at his own cost to take up and replace work as shall have been rejected by the Engineer, then the Owner shall notify the surety company of the condition, and after ten (10) days' written notice to the Contractor and the surety company, or without notice if an emergency or danger to the work or public exists, and without prejudice to any other right which the Owner may have under the Contract, take over that portion of the work which has been improperly executed and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the Contractor.

E-6. Owner's Right to Transfer Employment. If the Contractor should be adjudged a bankrupt; or if he should make a general assignment for the benefit of his creditors; or if a receiver should be appointed on account of his insolvency; or if he should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials; or if he should fail to make prompt payment to subcontractors or for material or labor; or persistently disregard laws, ordinances, or the instructions of the Engineer; or otherwise be guilty of a substantial violation of any provision of the Contract or any laws or ordinance; then the Owner, if sufficient cause exists to justify such action, may without prejudice to any other right or remedy, and after giving the Contractor and Surety seven (7) days' written notice, transfer the employment for said work from the Contractor to the Surety. Upon receipt of such notice, such Surety shall enter upon the premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the work included under this Contract and employ, by contract or otherwise, any

person or persons to finish the work and provide the materials therefor without termination of the continuing full force and effect of this Contract. In case of such transfer of employment to such Surety, the Surety shall be paid in its own name on estimates according to the terms hereof without any right of the Contractor to make any claim for the same or any part thereof. In lieu of the foregoing, if the Owner so elects, he may terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the work by whatever method he may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of completing the Contract, including compensation for additional managerial and administrative services, shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner.

E-7. Delays and Extension of Time. If the Contractor be delayed at any time in the progress of the work by any act or neglect of the Owner or the Engineer, or of any employee of either; or by any separate contractor employed by the Owner; or by changes ordered in the work; or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties, or any causes beyond the Contractor's control which justifies the delay, then the date for completion of the work shall be extended. Within a reasonable period after the Contractor submits to the Engineer a written request for an extension of time, the Engineer will present his written opinion to the Owner as to whether an extension of time is justified; and, if so, the number of days extension due the Contractor. The Owner will make the final decision on all requests for extension of time.

No such extension shall be made for delay occurring more than seven (7) days before claim therefor is made in writing to the Engineer. In the case of a continuing cause of delay, only one claim is necessary.

E-8. Liquidated Damages. Should the Contractor fail to complete the work, or any part thereof, in the time agreed upon in the Contract or within such extra time as may have been allowed for delays by extensions granted as provided in the Contract, the Contractor shall reimburse the Owner for the additional expense and damage for each calendar day, Sundays and holidays excluded, that the Contract remains uncompleted after the Contract completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work is the per diem rate stipulated in the Contract. The said amounts are hereby agreed upon as liquidated damages for the loss to the Owner on account of expense due to the employment of engineers, inspectors, and other employees after the expiration of the time of completion, and on account of the value of the operation of the works dependent thereon. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the Contractor; and the Owner is authorized to deduct the amount of such damages from any monies due the Contractor for work performed or material furnished under this Contract; and the Contractor and his Sureties shall be liable for any excess.

E-9. Other Contracts. The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their

materials and the execution of their work and shall properly connect and coordinate his work with theirs.

If any part of the Contractor's work depends, for proper execution or results, upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. His failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work, except as to defects which may develop in the other contractor's work after execution of his work.

E-10. Use of Premises. The Contractor shall confine his equipment, the storage of materials, and the operation of his workmen to limits shown on the Plans or indicated by law, ordinances, permits, or directions of the Engineer, and shall not unreasonably encumber the premises with his materials. The Contractor shall provide, at his own expense, the necessary rights-of-way and access to the work which may be required outside the limits of the Owner's property.

The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

E-11. Use of Completed Portions. The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work, or such portions, may not have expired, but such taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of the work, or delays the completion of the work, the Contractor shall be entitled to extra compensation or an extension of time, or both. The Contractor's attention is directed to Articles E-7 and F-2.

E-12. Cutting and Patching. The Contractor shall do all cutting, fitting, or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the Plans. Any defective work or material, performed or furnished by the Contractor, that may be discovered by the Engineer before the final acceptance of the work or before final payment has been made shall be removed and replaced or patched, in a manner as approved by the Engineer, at the expense of the Contractor.

E-13. Cleaning Up. The Contractor shall, at all times, at his own expense, keep property on which work is in progress and the adjacent property free from accumulations of waste material or rubbish caused by employees or by the work. Upon completion of the construction, the Contractor shall, at his own expense, remove all temporary structures, rubbish, and waste materials resulting from his operations.

F. PAYMENT

F-1. Partial Payment. On or about the last two (2) ays of each calendar month, the Engineer will make an estimate of the value of the work satisfactorily completed, including acceptable material delivered. The amount of said

estimate, after deducting ten percent (10%) as provided hereinafter and all previous payments, shall be due and payable to the Contractor not more than ten (10) days after the last day of said month, except where the Owner is a municipality whose laws require the approval of each payment by a council or similar body; in which case, the amount of said estimate shall become due and payable ten (10) days after the first meeting in the following month scheduled for approval of such payments.

When the Contract price for public work exceeds Twenty-Five Thousand Dollars ($25,000.00), the Owner will deduct ten percent (10%) of all progress payments for the work completed until five percent (5%) of the total Contract price has been retained. No additional retainage will be withheld unless otherwise provided in the Special Provisions. The amount retained as provided above will be withheld by the Owner until completion of the Contract to insure faithful completion of the work under the terms of the Contract Documents.

To receive partial payment for materials delivered, but not incorporated in the work, it shall be necessary for the Contractor to submit to the Engineer at least seven (7) days prior to the end of said month a list of such materials, with costs supported by invoices of suppliers. Proper storage and protection shall be provided by the Contractor. Final payment shall be made only for materials actually incorporated in the work and, upon acceptance of the work, all materials remaining for which advance payments had been made shall revert to the Contractor, unless otherwise agreed, and partial payments made for these items shall be deducted from the final payment for the work.

Monthly partial payments shall be conditional upon prosecution of the work in accordance with the provisions of the Contract and, on contracts for any public work in the State of Oregon except Federal projects, upon filing with the Owner by the Contractor the Wage Certification Form required by ORS Chapter 279, 1963, as amended.

Nothing contained in this article shall be construed to affect the right, hereby reserved, to reject the whole or any part of the aforesaid work should such work be later found not to comply with the provisions of the Contract Documents. All estimated quantities of work for which progress payments have been made are subject to review and correction on the final estimate. Payment by the Owner and acceptance by the Contractor of progress payments based on periodic estimates of quantities of work performed shall not, in any way, constitute acceptance of the estimated quantities used as the basis for computing the amounts of the progress payments.

F-2. Extra Work. Any work necessary or required to carry out the intent of these Contract Documents by changes clearly not indicated in the Contract Documents or which cannot reasonably be implied from the intent and meaning of the Contract Documents shall be considered as extra work. Payment for any ordered extra work or changes shall be determined by:

a. Unit prices used in the Contract Documents or agreed upon for the extra work or changes; or

b. Lump sum agreement, in writing, between the Contractor and the Owner; or

c. Force Account Work. If the method of payment cannot be agreed upon prior to the beginning of the work, and the Owner or the Engineer directs that the work be done on a force account basis, then the Contractor shall furnish labor, equipment, and materials at costs and rates in effect at the time the work is accomplished plus percentage allowances as designated hereinafter:

	Items of Cost on Which Payments Will Be Allowed	Percentage Allowance**
(1)	Payroll, for jobsite personnel*	15%
(2)	Delivered costs of materials and supplies actually used on the designated work.	10%
(3)	Rental on each piece of equipment, not owned by the Contractor, having a value in excess of $100 actually used on the work.	15%
	Rental on each piece of equipment, owned by the Contractor, having a value in excess of $100 actually used on the work.	15%
	(Rental rates shall not exceed those of the State Highway Department for comparable equipment.)	
(4)	Subcontractors' bills (if any).	10%

For equipment rented on a day or hour basis, rental will be allowed for only those days or hours during which the equipment is in actual use. The rentals allowed for equipment will in all cases be understood to cover all fuel, supplies, repairs, and renewals, and no further allowances will be made for those items unless specific agreement to that effect is made.

If the latter method of payment is used, a breakdown of the Contractor's costs involved in any approved extra work shall be submitted to the Engineer within thirty (30) days after said extra work has been performed.

No payment will be made for extra work billed and submitted to the Engineer after the thirty (30) day period has expired. No extra work shall be performed by the Contractor, except in an emergency endangering life or property, unless in pursuance of a written order, as provided in Article B-3 of these General Conditions.

* Including documented actual wages and fringe benefits, labor insurance, taxes, and any other labor burdens.
**Includes all other overhead and profit.

F-3. Release of Liens or Claims. The Contractor shall submit, by a means acceptable to the Owner, evidence that provisions have been made to satisfy all liens or claims growing out of lawful demands for materials, labor, and incidentals in connection with the work before the final payment or any part of the retained percentage shall become due. Such means may include, but are not limited to, one or more of the following:

a. Receipts in full for all items out of which a lien or claim could arise.

b. Complete release of all liens and claims.

c. Affidavit by Contractor that receipts or releases account for all labor, materials, or incidentals used in the work.

d. A bond to indemnify Owner against any lien or claim.

If any lien or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien or claim, including all costs and a reasonable attorney's fee.

F-4. Final Payment. Upon completion of the work, the Contractor shall notify the Engineer, in writing, that he has completed his part of the Contract and shall request final payment. If the work has been completed to the intent of the Contract Documents, the Engineer shall recommend acceptance of the completed work and submit a final estimate of the amount due the Contractor under this Contract. Upon approval of this final estimate by the Owner and compliance with provisions in Article F-3 of these General Conditions, and other provisions as may be applicable, the Owner shall pay to the Contractor all monies due him under the provisions of these Contract Documents.

On contracts for public works, final payment of the retained percentage will not be made until the Contractor has also furnished the Wage Certification required by ORS Chapter 279, 1963, as amended.

SPECIAL SPECIFICATIONS

Foreword: The Contractor shall furnish all labor, materials, and equipment necessary or required to complete the work, in all respects, as shown on the Plans or as hereinafter specified, or both. The numbering system employed in these Special Specifications is used throughout the Contract Documents. Each section is divided, where applicable, into A, Scope; B, Materials; C, Workmanship; and D, Payment. This method is employed to facilitate the work of the Contractor in preparing his Proposal, and in following the Special Specifications during the construction.

When references to the following capitalized abbreviations are made, they refer to Specifications, Standards, or Methods of the respective national association. Abbreviations listed herein but not mentioned in the Special Specifications shall be disregarded.

AASHO	American Association of State Highway Officials
ACI	American Concrete Institute
AFBMA	Anti-Friction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturer's Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCA	Air Moving and Conditioning Association
ANSI (USAS) (ASA)	American National Standards Institute References to USA and ASA Standards shall be deemed to refer to Standards of the American National Standards Institute. There is no change in the index identification on previously printed current ASA or USA Standards or their technical content, and they shall be considered to be ANSI Standards regardless of the designation.
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWS	American Welding Society
AWPA	American Wood Preservers' Association
CBMA	Certified Ballast Manufacturers Association
DFPA	Division for Product Approval of the American Plywood Association
Fed. Spec.	Federal Specifications
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IPCEA	Insulated Power Cable Engineers Association
JIC	Joint Industry Conferences of Hydraulic Manufacturers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NESC	National Electric Safety Code
NFPA	National Fire Protection Association
NLMA	National Lumber Manufacturers Association

May '70 Rerun: July '70

OECI	Overhead Electrical Crane Institute
RLM	RLM Standards Institute, Inc.
SSPC	Steel Structures Painting Council
TEMA	Tubular Exchanger Manufacturer's Association
UBC	Uniform Building Code
UL	Underwriters' Laboratories, Inc.
WCLIB	West Coast Lumber Inspection Bureau

The numbers and letters following the abbreviations denote the Association's serial designation for the Specification or Standard to which reference is made. Unless a particular issue is designated, all references to the above Specifications, Standards, or Methods shall, in each instance, be understood to refer to the issue in effect (including all amendments) on the date of the Advertisement for Bids or the Invitation for Bids.

Standard Specifications, when referred to herein, except the above, are found at the end of the Special Specifications.

****

1A. GENERAL REQUIREMENTS

The Contractor's attention is directed to the SPECIAL PROVISIONS, which contain other special requirements that are pertinent to this project.

The submission of a Proposal shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the Contract Documents.

SUBSURFACE INFORMATION. No test pits or test holes have been dug. The Contractor shall examine the site and make his own investigation.

The Engineer and Owner will make available to all prospective bidders, upon request prior to receipt of proposals, all information that they may have as to subsurface conditions and surface topography at the work site. Such information is offered as supplementary information only. Neither the Engineer nor the Owner assumes any responsibility for the completeness or interpretation of such supplementary information.

UNDERGROUND UTILITIES. Known utilities and structures expected to be adjacent to or encountered in the work are shown on the Plans. It is expected that there may be some discrepancies and omissions in the locations and quantities of utilities and structures shown. Those shown are for the convenience of the Contractor only, and no responsibility is assumed by either the Owner or the Engineer for their accuracy or completeness.

TEMPORARY WATER. Water is available from hydrants; however, the Contractor shall make his own arrangements and pay all costs for obtaining and transporting the water from the hydrants of the water system to the area of usage for the construction and testing of the facilities. Upon completion of the work, the Contractor shall remove all temporary piping and facilities used during the construction.

Secure permission from the representative of the Water Department or other administering agency, as well as the Fire Department before obtaining water from any fire hydrant. The Engineer shall also be notified of this request. Use only special hydrant operating wrenches to open hydrants and also make certain that the hydrant valve is open "full," since "cracking" the valve causes damage to the hydrant. If any hydrants are damaged, the Contractor will be held responsible and shall notify the appropriate water agency so that all damage can be repaired as quickly as possible. Maintain all fire hydrants within this work area in a completely accessible condition for the Fire Department at all times during the Contract.

TEMPORARY ELECTRIC POWER. No electric power is available at the site. Make arrangements for electrical power for use during the construction period until final acceptance by the Owner, and pay all costs for same.

SEQUENCE OF OPERATIONS. Plan the construction work and carry out with a minimum of interference with the operation of the existing facilities. Prior to starting the construction, confer with the Engineer and Utilities Superintendent and develop an approved construction schedule which will permit the

distribution system to function as normally as practical during the construction period. It may be necessary to do certain parts of the construction work outside normal working hours in order to avoid undesirable conditions, and it shall be the obligation of the Contractor to do this work at such times at no additional cost to the Owner. Do not make connections between existing piping and new piping until necessary inspection and tests have been completed on the new work and it is found to conform in all respects to the requirements of the Plans and Specifications.

LAND MONUMENTS. The Contractor shall preserve or replace all existing Federal, State, City, County, and private land monuments, unless they are within 6 feet of the trench center line. When these monuments are within the distance specified, the Contractor shall notify the Engineer at least 2 weeks in advance of the proposed construction in order that the Engineer will have ample opportunity to reference these monuments for later replacement by the Contractor.

Replaced or reset monuments shall be of acceptable type and quality, placed in a manner consistent with recognized engineering and surveying practices.

GENERAL CONSTRUCTION RESPONSIBILITIES AND PROCEDURES.

STATE, COUNTY, AND CITY ROADWAYS. Notify the appropriate authorities at least 48 hours prior to the start of any construction or excavation. Abide by all the requirements of the permits to work in these areas. All work for the crossings of State highways shall be completed between the start of work on Monday and the end of work on Thursday of any one week.

PUBLIC SAFETY AND CONVENIENCE. Comply with all rules and regulations of the City, State, and County authorities regarding the closing of public streets or highways to use of public traffic. No road shall be closed to the public except by express permission of the Engineer. Conduct the work so as to assure the least possible obstruction to traffic and normal commercial pursuits. Protect all obstructions within traveled roadways by approved signs, barricades, and lights where necessary or ordered by the Engineer for the safety of the public. The convenience of the general public and residents along the pipeline, and the protection of persons and property are of prime importance and shall be provided for in an adequate and satisfactory manner.

The Contractor shall use every reasonable precaution to safeguard the persons and property of the traveling public. It shall be the sole responsibility of the Contractor to furnish, place, and maintain those barricades, barriers, lights, flares, danger signals, and watchmen as are necessary to protect the persons and property of the traveling public. All barricades and obstructions shall be protected at night by signal lights which shall be suitably distributed and kept burning from sunset to sunrise.

Whenever the Contractor's operations create a hazardous condition, he shall furnish flagmen and guards as necessary, or as ordered by the Owner or other public agencies, to give adequate warning to the public of any dangerous conditions to be encountered. Equip flagmen and guards, while on duty and assigned to give warning to the public, with approved red wearing apparel and a red flag which shall be kept clean and in good repair.

Protect stored materials, cultivated trees and crops, and other items located adjacent to the proposed pipelines. Notify property owners affected by the construction at least 48 hours in advance of the time construction begins. During all construction operations, construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to his residence or place of business for a period exceeding 8 hours, unless the Contractor has made special arrangements with the affected persons.

Provide for access at all times for livestock through farm areas; and, no portion of farmlands in which livestock are pastured shall be cut off from ready access by the farm animals.

ACCESS FOR POLICE, FIRE, AND POSTAL SERVICE. Notify the Fire Department and Police Department before closing any street or portion thereof and no closing shall be made without the Owner's approval. Notify said Departments when the streets are again passable for emergency vehicles. Do not block off emergency vehicle access to any area, such as consecutive arterial crossings or dead-end streets, in excess of 300 linear feet, unless the Contractor obtains special written permission from the Chief of the Fire Department. Conduct operations so as to cause the least interference with the fire station access and at no time prevent such access.

The Contractor shall leave his night emergency telephone number or numbers with the Police Department, so that the contact may be made easily at all times in case of barricade and flare trouble or other emergencies.

Maintain postal service facilities in accordance with the requirements of the U.S. Post Office Department. Move mailboxes to temporary locations designated by the Post Office Department, and at the completion of the work in each area, replace them in their original location and in a condition satisfactory to the U.S. Post Office Department.

PROGRESS OF CONSTRUCTION. It is the intent of these Contract Documents that the work shall proceed in a systematic manner so that a minimum of inconvenience will result to the public in the course of construction. It is, therefore, necessary to confine operations to as small a length of work area per crew as is feasible. Except under permission of the Engineer, at no time shall the trenching equipment be farther than 200 feet ahead of each pipe-laying crew. Backfill the trench so no section of approved pipe is left open longer than 24 hours, except by permission of the Engineer. Completely backfill and clean up after each section of pipe has been inspected and approved.

The Engineer reserves the right to withhold line and grade on any pipelines when, in his opinion, excessive trench is being opened ahead of the pipe laying; when backfilling behind the pipe laying is not proceeding satisfactorily; when pipe testing, as outlined herein, is not satisfactory; and when cleanup and restoration of all physical properties are lagging.

Cleanup of all construction debris, excess excavation, excess materials, and complete restoration of all fences, mailboxes, ditches, culverts, signposts, and similar items shall be completed immediately following the final backfilling of the pipeline.

EASEMENTS. Where portions of the work will be located on private property, easements and permits are being obtained by the Owner. Easements shall provide for the use of property for construction purposes to the extent indicated on the easements. Copies of these easements and permits will be available from the Owner for inspection by the Contractor. The Contractor shall confine his construction operations to within the easement limits or street right-of-way limits or make special arrangements with the property owners for the additional area required. Any damage to private property, either inside or outside the limits of the easements provided by the Owner, shall be the responsibility of the Contractor as specified herein. Before final payment will be authorized by the Engineer, the Contractor will be required to furnish the Owner with written releases from property owners where side agreements or special easements have been made by the Contractor or where the Contractor's operations, for any reason, have not been kept within the construction right-of-way obtained by the Owner.

It is anticipated that all the required easements and permits will be obtained before construction is started. However, should the procurement of any easement or permit be delayed, the Contractor shall schedule his work in such a way that his operations are confined to areas where easements or permits have been obtained or are not required, until such time as the easement or permit has been secured.

INTERFERING STRUCTURES. Take necessary precautions to prevent damage to existing structures whether aboveground or underground. An attempt has been made to show major structures on the Plans. While the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed.

Protect all underground and aboveground existing structures from damage, whether or not they lie within the limits of the easements obtained by the Owner. Where such existing fences, gates, barns, sheds, buildings, or any other structure must be removed in order to properly carry out the construction, or are damaged during construction, restore to their original condition to the satisfaction of the property owner involved at no additional cost to the Owner. Notify the Engineer of any damaged underground structure, and make repairs or replacements before backfilling takes place.

Remove and replace such small miscellaneous structures as fences, mailboxes, and signposts without additional compensation from the Owner. Replace these structures in a condition as good or better than their original condition.

If existing structures are encountered which will prevent the construction of the pipeline and which are not properly shown on the Plans, notify the Engineer before continuing with the construction in order that the Engineer may make such field revisions as necessary to avoid conflict with the existing structures. The cost of waiting or "down-time" during such field revisions shall be borne by the Contractor without additional cost to the Owner. If the Contractor shall fail to so notify the Engineer when an existing structure is encountered, but shall proceed with the construction despite this interference, he shall do so at his own risk.

CONTRACTOR'S RESPONSIBILITY FOR UTILITY PROPERTIES AND SERVICE. At points where the Contractor's operations could cause damage which might result in considerable expense, loss, and inconvenience when his operations are adjacent to or near railway, telegraph, telephone, television, power, oil, gas, water, sewer, irrigation, or other private or municipal systems, the operations shall be suspended until all arrangements necessary for the protection thereof have been made by the Contractor.

Notify all utility offices which are affected by the construction operation at least 48 hours in advance. Under no circumstances expose any utility without first requesting permission and being granted to do so from the affected agency. Once permission has been granted, locate, if necessary, and expose all existing underground utilities in advance of the trenching operation.

Power poles less than 2 feet from the trench center line will be removed or protected at no cost to the Contractor. Protect all other poles from damage. If interfering power poles, telephone poles, guy wires, or anchors are encountered, notify the Engineer at least 48 hours in advance of construction operations to permit the necessary arrangements with the affected utility company for protection or relocation of the interfering structure.

The Contractor shall be solely and directly responsible to the Owner and operators of such properties for any damage, injury, expense, loss, inconvenience, delay, suits, actions, or claims of any character brought because of any injuries or damage which may result from the carrying out of the work to be done under the Contract.

In the event of interruption to domestic water, sewer, storm drain, or to other utility services as a result of accidental breakage, or as a result of being exposed or unsupported, promptly notify the proper authority. Cooperate with said authority in restoration of service as promptly as possible and bear all costs of repair. In no case shall interruption of any water or utility service be allowed to exist outside working hours unless prior approval is received.

Neither the Owner nor its officers or agents shall be responsible to the Contractor for damages as a result of the location of the underground utilities being other than that shown on the Plans or for the existence of underground utilities not shown on the Plans.

In the event the Contractor encounters water service lines that interfere with trenching, he may, by obtaining prior approval of the Engineer, cut the service, dig through, and restore the service with similar and equal materials at the Contractor's expense.

Drainage culverts which are at or near right angles to the pipeline and are removed by the Contractor shall be replaced in kind at the expense of the Contractor; however, where the center line of the pipeline is within 4 feet of the center line of an existing parallel culvert, the Owner will pay the Contractor in accordance with the Special Specifications.

The Contractor shall replace, at his own expense, any and all other existing utilities or structures removed or damaged during construction, unless otherwise provided for in these Contract Documents or ordered by the Engineer.

WYNOOSKI STREET. Some large pipelines from Publishers Paper Mill cross Wynooski Street. Excavation along this street must be done with utmost caution. Hand digging may be required when excavating in close proximity of existing utilities within this area. The general location and depth of existing utilities are shown on the Plans. Contact Publishers Paper Co. Engineering Department at least 48 hours prior to start of excavation in this vicinity.

FIELD RELOCATION. During the progress of construction, it is expected that minor relocations of the line will be necessary. Such relocations shall be made only by direction of the Engineer. Unforeseen obstructions encountered as a result of such relocations will not be subjects for claims for additional compensation by the Contractor to any greater extent than would have been the case had the obstructions been encountered along the original location.

SITE RESTORATION AND CLEANUP. At all times during the work, keep the premises clean and orderly, and upon completion of the work, leave the project free of rubbish or excess materials of any kind.

AREAS OF SPECIAL CONSTRUCTION. The Contractor will be required to take special precautions on several locations where the waterline crosses lawn and garden areas. Within these areas, the Contractor will not be permitted to operate any motor-powered equipment, other than a Ford, John-Deere, Case, etc., type rubber-tired tractor equipped with a backhoe and front-end loader unless otherwise approved by the Engineer.

Remove, intact with their root systems, all trees, shrubs, or plants that interfere with the construction of the waterline. Accurately record the location of each plant prior to its removal. The root system of the trees, shrubs, or plants shall be balled and bound in burlap and heeled into the stockpiled topsoil from the trench excavation.

Cut turf in neat strips; remove to minimum depth of 3 inches; store; maintain; and replace to match original condition. Replace topsoil beneath sod prior to replacement or reseeding. Topsoil and reseeding may be substituted with property owner's written permission. Accomplish all reseeding with first-quality seed approved by property owner in accordance with best accepted lawn planting practices. Contractor shall be responsible for obtaining a satisfactory grass turf acceptable to the property owner.

Upon completion of the pipe laying and backfilling of the trench, replant the trees, shrubs, or plants in their original position. Should any tree, shrub, or plant that has been removed and replanted die within 6 months from the time that it was disturbed, it shall be replaced in kind and size by the Contractor at his expense.

All Visqueen removed or damaged by the Contractor's operations shall be replaced with new Visqueen and shall overlap the existing layer with a 12-inch lap.

All barkdust removed shall be replaced with the same material and shall be the same depth as the adjoining area.

Payment for these items shall be considered as being included in the prices stated in the Contractor's Proposal for the various classes of trench excavation and backfill.

Topsoil removal and replacement shall be as specified in Section TRENCH EXCAVATION AND BACKFILL.

During construction, stockpile the excavated trench materials so as to do the least damage to adjacent lawns, grassed areas, gardens, shrubbery, or fences, regardless of whether these are on private property, City, State, or County rights-of-way. Remove all excavated materials from grassed and planted areas; and leave these surfaces in a condition equivalent to their original condition and free from all rocks, gravel, boulders, or other foreign material. Replace topsoiled areas as specified in Section TRENCH EXCAVATION AND BACKFILL, raked and graded to conform to their original contours. All existing drainage ditches and culverts shall be reopened and graded and natural drainage restored. Restore culverts broken or damaged to their original condition and location.

Upon completion of pipe laying and backfilling operations in any section, hand-rake and drag all former grassed and/or planted areas leaving all disturbed areas free from rocks, gravel, clay, or any other foreign material. The finished surface shall conform to the original surface, and shall be free-draining, free from holes, rough spots, or other surface features detrimental to a seeded area.

Upon completion of the project, all areas used by the Contractor in connection with the work shall be finished as follows: Project site, borrow, and storage areas properly cleared of all temporary structures, rubbish, and waste materials and properly graded to drain and blend in with the abutting property; any waste area obtained by the Contractor for deposit of waste materials shall be finished to properly drain and blend with the surrounding terrain.

STREET CLEANUP DURING CONSTRUCTION. Clean all spilled dirt, gravel, or other foreign material caused by the construction operations from all streets and roads at the conclusion of each day's operation. Cleaning shall be by grader and front-end loader supplemented by washing with water, power brushing, and hand labor.

DUST PREVENTION. All streets, roads, or detours with a dust hazard caused by the Contractor's operations, shall be given an oil dust preventative treatment or continually watered to prevent dust. Dust prevention measures shall be continuous until final acceptance by the Owner.

IRRIGATION AND DRAINAGE DITCHES. Arrange schedules so that construction will not interfere with the irrigation of cultivated lands or pasturelands. Schedule operations during the nonirrigating season through irrigated lands or at Contractor's option; construction may proceed during the irrigation season provided the Contractor constructs, at his own expense,

such temporary irrigation ditches, turnouts, and miscellaneous structures approved by the Engineer which shall permit the land to be irrigated by others during construction.

Following the backfill of the trenches, restore all irrigation and storm drain ditches destroyed, damaged, or otherwise modified during construction to a condition equivalent, in the opinion of the Engineer, to the condition of the ditch before construction. Ditches so reconstructed shall be built in their original locations.

DRAIN FIELDS OR DRAINAGE TILE. The Contractor shall exercise due care in excavating in these areas. If damage is done to any drain fields or drainage tile, the Contractor shall make prompt repairs equal to, or better than, original materials and ascertain that these are open and free draining.

REMOVAL OF ROCK FROM FINISHED SURFACES. All loose rock and boulders larger than 2-inch diameter occurring on the surface of road or street shoulders as a result of the Contractor's operations shall be removed and disposed of by the Contractor. Removal shall be by mechanical means and supplemented by hand labor where necessary. All loose material larger than 2-inch diameter shall be removed prior to application of any required rock surfacing.

OPERATION OF VALVES IN WATER SYSTEM PROHIBITED. At no time undertake to close off any lines or open valves, or take any other action which would affect the operation of the existing water system, except as specifically required by the Plans and Specifications and after approval is granted by the Owner. Request approval well in advance of the time that the interruption of the existing service is required.

RESPONSIBILITY FOR DAMAGE TO EXISTING STRUCTURES. Where any existing structures or facilities which are intended to remain are damaged by the Contractor during demolition or construction, the Contractor shall promptly repair or replace the damaged portion or facility at no additional cost to the Owner.

STORAGE OF MATERIALS. Materials shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces, and not on the ground, and/or they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the owner or lessee.

SALVAGED MATERIALS. Materials salvaged from the existing pipelines shall be delivered to the City shops, or as directed by the Engineer.

PAYMENT. Except where otherwise stated, the work specified in this section shall be considered incidental to the project cost, and the expense shall be included in the unit price bids, as applicable.

2A. TRENCH EXCAVATION AND BACKFILL

A. SCOPE. This section covers the work necessary for the trench excavation and backfill, complete.

TYPE OF BACKFILL. Trench excavation and backfill will be divided into the following classifications for the purpose of payment:

CLASS C BACKFILL. Class C backfill will, generally, be limited to locations where trenches are located in unsurfaced areas and where prevention of subsequent trench settlement is not considered critical.

CLASS D BACKFILL. Class D backfill will, generally, be limited to City and County traveled roadways and crossings where surface replacement will be made shortly after backfilling and subsequent trench settlement must be held to a minimum.

CLASS E BACKFILL. Class E backfill will, generally, be limited to the shoulders of City streets and roadways on which gravel surfacing is to be replaced.

CLASS F BACKFILL. Class F backfill will, generally, be limited to State highway roadways and crossings where surface replacement will be made shortly after backfilling and subsequent trench settlement must be held to a minimum.

CLASS H BACKFILL. Class H backfill will, generally, be limited to lawns, gardens, and ditches where subsequent trench settlement must be minimized.

CLASS J BACKFILL. Class J backfill will, generally, be limited to the shoulders of County roadways where subsequent trench settlement must be held to a minimum.

GENERAL. For bidding purposes, the class of backfill to be used is indicated. The right is reserved to modify the use, location, and quantities of the various types of backfill during construction as the Engineer considers to be to the best interest of the Owner. No claims for extra payment will be allowed for any deviation from the original, unless specifically outlined in other portions of these Specifications. During construction, the Engineer will designate the type of backfill to be used in each location throughout the project.

EXCAVATION AND BACKFILL FOR FIRE HYDRANTS AND SIMILAR APPURTENANCES. Will be included for payment under the applicable section.

B. MATERIALS.

TRENCH EXCAVATION. Trench excavation shall be classified as common. No rock excavation is anticipated.

COMMON EXCAVATION. Common excavation is defined as the removal of all material which is not classified as rock excavation.

ROCK EXCAVATION. Rock excavation is defined as the removal of all material which by actual demonstration cannot, in the Engineer's opinion, be reasonably excavated with a 3/4-yard, Bucyrus Erie 22-B backhoe equipped with a 19-foot boom, general duty dipper and rock points, or similar approved equipment.

If rock is encountered, the Contractor and the Owner will negotiate a price for rock excavation.

Individual masses of material having less than 1/2 cubic yard volume within the limits of the trench shall not be classed as rock excavation, regardless of the method of excavation and removal.

TRENCH BACKFILL.

FOUNDATION STABILIZATION. Three-inch minus crushed rock, with reasonably even gradation from coarse to fine and free from excessive dirt or other foreign material.

SELECTED FILL MATERIAL FOR MINIMUM COVER REQUIREMENTS. As directed by the Engineer, waste trench material shall be used to provide minimum cover, provided that no piece of material is larger than 2 inches on the surface of the resulting backfill area.

CLASS C AND H BACKFILL. Class C and H backfill above the pipe zone shall be the native material excavated from the trench with no lumps or masses larger than 1/4 cubic foot. See Standard Detail No. 204.

CLASS D BACKFILL. Gravel for Class D backfill from the top of the pipe zone to a point 8 inches below the bottom of the existing asphalt surfacing shall be clean bank- or pit-run gravel or crushed rock, having reasonably even gradation from coarse to fine with a maximum size of 3 inches. The next 8 inches shall be 3/4-inch minus crushed rock or gravel. See Standard Detail No. 204.

CLASS E BACKFILL. Class E backfill shall be native material from the top of pipe zone to 8 inches below finished grade. The top 8 inches shall be 3/4-inch minus crushed rock or gravel. See Standard Detail No. 204.

CLASS F BACKFILL. Gravel for Class F backfill from the top of the pipe zone to a point 12 inches below the bottom of the existing asphalt surfacing shall be clean bank- or pit-run gravel or crushed rock, having reasonably even gradation from coarse to fine, with maximum size of 3 inches. The next 12 inches shall be 3/4-inch minus crushed rock or gravel. See Standard Detail No. 204.

CLASS J BACKFILL. Gravel for Class J backfill above the top of the pipe zone to a point 8 inches below finished grade shall be clean bank- or pit-run gravel or crushed rock having reasonably even gradation from coarse to fine with maximum size of 3 inches. The top 8 inches shall be 3/4-inch minus crushed rock or gravel. See Standard Detail No. 204.

ROCK SURFACING. Rock surfacing shall be 3/4-inch minus crushed gravel or rock. See Section SURFACE RESTORATION.

MANUALLY GUIDED VIBRATORY COMPACTOR. Self-propelled machine that compacts granular material by a combination of weight, vibration, and impact, similar to the Jackson Manually Guided Vibratory Compactor, as manufactured by Jackson Vibrators, Inc., of Ludington, Michigan. Operate the compactor at a speed not exceeding 60 linear feet per minute or at the speed recommended by the manufacturer if slower. A pass of the machine shall consist of one trip over each lift of backfill material with a 2-inch overlap on previously compacted area.

C. WORKMANSHIP.

CLEARING THE RIGHT-OF-WAY. Where clearing of the right-of-way is necessary, complete prior to the start of trenching. Cut trees and brush as near to the surface of the ground as practicable and pile for disposal. Stumps within 4 feet of the trench center line shall be removed. All trees, brush, and other flammable debris from the clearing shall be burned or otherwise disposed of off the construction site in an approved location at the Contractor's expense. Observe all Federal and State laws relating to fire permits and local regulations relating to burning such materials. Do not permit excavated materials to cover brush or trees prior to clearing and burning.

Do not remove existing trees or tree limbs, whether on public or private property, without permission from the Engineer.

OBSTRUCTIONS. This item refers to obstructions which may be removed and do not require replacement. Obstructions to the construction of the trench such as tree roots, stumps, abandoned piling, buildings and concrete structures, logs, rubbish, and debris of all types shall be removed without additional compensation from the Owner. The Engineer will, if requested, make changes in the trench alignment to avoid major obstructions, if such alignment changes can be made within the perpetual easement and right-of-way and without adversely affecting the intended function of the facility. The Contractor shall pay all additional costs or credit the Owner for any savings resulting from such alignment changes.

REMOVAL OF TOPSOIL. Attention is directed to Section GENERAL REQUIREMENTS for additional trench surfacing and/or seeding requirements. In all cases, where trenches cross lawns, garden areas, pasturelands, cultivated fields, or other areas on which reasonable topsoil conditions exist, first remove the topsoil for a depth of 12 inches for the full width of the trench to be excavated. Stockpile this topsoil to one side of the right-of-way and do not mix with the remaining excavated material. Replace the topsoil in the top 12 inches of the backfilled trench. Minimum finished depth of topsoil over all trenches shall be 10 inches. In lieu of stockpiling the top 12 inches of soil, approved loam topsoil from borrow pits may be substituted in the top 12 inches. Maintain the finished grade of the topsoil over the center line of the trench level with the immediate area bordering the trench until final acceptance by the Engineer. Correct all damage to adjacent topsoil caused by trenching or pipe-laying operations by regrading, removal of all rock, gravel, clay, and any other foreign materials from the surface, and by the addition of topsoil when required.

PAVEMENT, CURB, AND SIDEWALK REMOVAL. Cut all bituminous and concrete pavements, regardless of the thickness, and all curbs and sidewalks prior to

excavation of the trenches with an approved pavement saw, hydrohammer, or other approved cutter. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface.

Pavement and concrete materials removed shall be taken from the site and not used for trench backfill.

TRENCH WIDTH. Minimum width of unsheeted trenches in which pipe is to be laid shall be 18 inches greater than the inside diameter of the pipe, except by permission of the Engineer. Sheeting requirements shall be independent of trench widths.

The maximum clear width at the top of the pipe will not be limited, except in cases where excess width of excavation would cause damage to adjacent structures.

In all cases, confine trench widths to dedicated rights-of-way for public thoroughfares or within areas for which construction easements have been obtained, unless special arrangements have been made with the affected property owners.

GRADE. Carry the bottom of the trench to the lines and grades shown or as established by the Engineer with proper allowance for pipe thickness and for gravel base or special bedding when required. Correct any part of the trench excavated below the grade at no additional cost to the Owner, with gravel of the type specified for pipe base under pipe by placing the gravel over the full width of trench in thoroughly compacted layers not exceeding 6 inches to the established grade.

SHORING, SHEETING, AND BRACING OF TRENCHES. Whenever necessary to prevent caving during excavation in sand, gravel, sandy soil, or other unstable material, or to protect adjacent structures or property, adequately sheet and brace the trench. Where sheeting and bracing are used, increase trench widths accordingly. Keep trench sheeting in place until the pipe has been placed, backfilled at the pipe zone, tested for defects, and repaired, if necessary. All sheeting, shoring, and bracing of trenches shall conform to the requirements of the public agency having jurisdiction.

LOCATION OF EXCAVATED MATERIALS. During trench excavation, locate the excavated material within the construction easement or right-of-way so that the excavated material will not obstruct any private- or public-traveled roadways or streets. Pile and maintain material from trenches so that the toe of the slope of the material excavated is at least 18 inches from the edge of the trench. It shall be the Contractor's responsibility, however, to determine the safe loading of all trenches with excavated material.

REMOVAL OF WATER. Provide and maintain ample means and devices with which to promptly remove and dispose of all water entering the trench excavation during the time the trench is being prepared for the pipe laying, during the laying of the pipe, and until the backfill at the pipe zone has been completed.

Dispose of the water in an approved manner without damage to adjacent property. Drainage of trench water through the pipeline under construction is prohibited.

FOUNDATION STABILIZATION. When, in the opinion of the Engineer, the existing material in the bottom of the trench is unsuitable for supporting the pipe, excavate below the flow line of the pipe, as directed by the Engineer, and backfill the trench to subgrade of pipe base.

PIPE COVER. The cover over the pipelines shall be 3-1/2 feet, unless changed by the Engineer or shown otherwise on the profile.

PIPE BASE AND BACKFILL IN PIPE ZONE. Base and pipe zone backfill are included in specification for pipe.

TRENCH BACKFILL ABOVE PIPE ZONE. Push all earth, gravel, or other material used in backfilling first onto the slope of the backfill previously placed and allow to roll down into the trench. Do not push the backfill material into the trench in such a way as to permit free fall of the material into the open trench until at least 2 feet of cover is provided over the pipe. Under no circumstances allow sharp, heavy pieces of material to drop directly onto the pipe or the tamped material around the pipe. Do not use backfill material of consolidated masses 1/4 cubic foot and larger in size or as otherwise specified.

CLASS C BACKFILL. After the completion of the backfilling of the pipe zone, the excavated trench material may be pushed back into the trench by mechanical means. The requirements for topsoil shall apply in all trenches designated on the Plans and by the Engineer.

Where Class C backfill is used on private or public street or road rights-of-way, leave the trench with the backfill material neatly mounded not more than 6 inches above the existing ground for the full width of the trench. When Class C backfill is used under lawn or garden areas, the trench shall be level with the existing grade. In all other locations where Class C backfill is used, the Contractor shall make his own estimate of the amount of backfill material required at the trench so that after normal settlement has occurred, the finished surface will meet the existing grade. Neatly windrow the material over the trench, and remove all excess. Any excess or deficiency of backfill material which becomes apparent after settlement and within the guarantee period shall be corrected by regrading, disposal of excess material, and adding additional material where required.

CLASS D BACKFILL. Backfill the entire trench above the pipe zone with Class D backfill material in layers not exceeding 6- to 10-inch loose lifts and compact each lift to 95 percent maximum density as determined by AASHO T 99, Method D, with approved pneumatic or gasoline powered compaction equipment.

Maintain the surface of the backfilled trench level with the existing grade with a 2-inch minimum layer of asphalt cold mix until permanent pavement replacement is completed.

Any subsequent settlement of the finished surfacing during the warranty period shall be promptly repaired by the Contractor at no cost to the Owner.

CLASS E BACKFILL. Backfill the trench above the pipe zone with excavated material to a depth of 8 inches below the ground surface. Place a

minimum of 8 inches of 3/4-inch crushed gravel or rock as specified over the entire trench surface and compact by at least 5 passes with the wheels of a loaded 10-yard dump truck or other approved equipment. The final backfilled surface shall be at the same level as the original surface. Any subsequent settlement of the finished surfacing during the warranty period shall be promptly repaired by the Contractor at no cost to the Owner.

CLASS F BACKFILL. Backfill the entire trench above the pipe zone with Class F backfill material in layers not exceeding 6- to 10-inch loose lifts, and compact each lift to 95 percent maximum density as determined by AASHO T 99, Method D, with approved pneumatic or gasoline powered compaction equipment.

Maintain the surface of the backfilled trench level with the existing grade with a 4-inch minimum layer of asphalt cold mix until permanent pavement replacement is completed.

Any subsequent settlement of the finished surfacing during the warranty period shall be promptly repaired by the Contractor at no cost to the Owner.

CLASS H BACKFILL. After completion of the backfilling of the pipe zone, the excavated trench material may be pushed back into the trench by mechanical means. Backfill the trench to a point slightly above the existing grade or ground surface. Then compact the surface for the entire trench width with no less than 5 coverages with the wheels of a blade grader, loaded 10-yard dump truck, or other similar equipment.

Maintain the surface of the backfilled trench with material at least equal in quality to the surface of the ground at the sides of the trench. Any excess or deficiency of backfill material which becomes apparent after settlement and within the guarantee period shall be corrected by regrading, disposal of excess material, and adding material where required.

CLASS J BACKFILL. Backfill the entire trench above the pipe zone with Class J backfill material in layers not exceeding 6- to 10-inch loose lifts and compact each lift to 95 percent maximum density as determined by AASHO T 99, Method D, with approved pneumatic or gasoline powered compaction equipment.

Maintain the surface of the backfilled trench level with the existing grade with 3/4-inch surfacing rock until the entire project is accepted by the Owner.

Any subsequent settlement of the finished surfacing during the warranty period shall be promptly repaired by the Contractor at no cost to the Owner.

EXCESS EXCAVATED MATERIAL. Dispose of all excess excavated materials. Make arrangements for the disposal and bear all costs or retain any profit incidental to such disposal.

DRAINAGE CULVERTS. Replace in kind drainage culverts which are removed and are at or near right angles to the trench center line. If the pipe is

damaged during removal, dispose of it and furnish and install new pipe. Dispose of culvert pipe that is in too poor condition to replace because of age, physical conditions, or other reasons beyond the Contractor's control, and install new pipe furnished by the Owner.

Where the center line of the proposed pipeline is within 3 feet of the center line of an existing parallel culvert, the Owner will pay for removal and replacement of the culvert under Section SURFACE RESTORATION.

Replace all culvert pipe to the lines and grades established by the Engineer. Do not replace culverts until the proposed pipeline is installed and the proper backfilling of the trench has been completed to the subgrade of the culvert.

D. PAYMENT. Payment for the work specified in this section will be made at the unit prices stated in the Contractor's Proposal and shall be included under the following items. Computation of quantities will be as indicated for each item and will be based upon measurements made by the Engineer.

TRENCH EXCAVATION AND BACKFILL. Payment for trench excavation and backfill will be made at the respective unit prices per linear foot stated in the Contractor's Proposal for the trench excavation and the class of backfill used, and all incidental work.

The length of trench for which payment will be made is based on the measured horizontal distance along the center line of the pipe and fittings in place.

Payment for trench excavation and the respective backfill shall constitute full compensation for all work specified under this item.

Consider the price bid per linear foot to include any extra excavation required to provide space for gravel base where specified or ordered by the Engineer. The bid price shall also include any incidental excavation and backfill necessary to widen the trench for installation of branch-line fittings. Pipe base and pipe zone backfill is specified under Section CAST IRON PIPE AND FITTINGS and Section CONCRETE CYLINDER PIPE AND FITTINGS.

FOUNDATION STABILIZATION. Payment for this item will be based on the unit price per cubic yard as stated in the Contractor's Proposal. Measurement will be based upon individual trip tickets of actual truck measure furnished the Engineer for cubic yards used under this item. Trip tickets shall be presented to the Engineer for his signature on the day the material is delivered. No payment will be allowed on trip tickets not so validated by the Engineer. Payment for this item shall be considered full payment for all materials, labor, equipment, and incidentals necessary to furnish materials at trench side and for placing it in the trench and for the extra depth of trench excavation required below flow line grade to provide for a stable base for the pipe. This item is to provide for unstable base encountered in the progress of the work and shall be used only under the direction of the Engineer.

REMOVAL AND REPLACEMENT OF TOPSOIL. Payment for removal and replacement of topsoil will be made at the unit price stated in the Contractor's Proposal. This payment shall constitute full compensation for all work specified under this section.

****

2B. SURFACE RESTORATION

A. SCOPE. This section covers the work necessary for all required replacement of pavement, curbs, sidewalks, and rock surfacing, complete.

B. MATERIALS.

ROCK FOR SURFACE REPLACEMENT AND LEVELING COURSE. Rock shall be crushed gravel or rock meeting the following quality standards:

Abrasion (AASHO T 96)	maximum wear	35%
Liquid Limit (AASHO T 89)	not greater than	30%
Plasticity Index (AASHO T 91)	not greater than	6%
Sand Equivalent (AASHO T 176)	not less than	35%
Fractured Face	min. of particles	50%

The aggregate shall consist of uniform quality, clean, tough, durable fragments of rock or gravel, free from flat, elongated, soft or disintegrated pieces, and other objectionable matter occurring either free or as a coating on the stone.

The sizes of the aggregates to be furnished shall be as indicated below and shall be furnished mixed to the proportions shown therein:

GRADATION

Sieve Size	Designated Size Leveling Course 3/4" Minus
1" to 3/4" size	0-10%
3/4" to 3/8" size	20-40%
Passing 1/4" sieve	40-60%
Passing 200 sieve	0- 5%

Submit proof in the form of test results from an approved commercial testing laboratory or other evidence satisfactory to the Engineer to show that the materials meet the quality and gradation requirements.

ASPHALT CONCRETE. Hot-plant mix with maximum 3/4-inch aggregate, conforming to the current Standard Specifications for Highway Construction of the Oregon State Highway Department. On 2-course pavements, maximum size aggregate shall be 1/2 inch in top course.

Asphalt cement shall be 85-100 penetration paving asphalt conforming to AASHO M 20.

ASPHALT PRIME. Liquid asphalt for use as a prime coat under asphalt concrete shall be RC-70 or MC-70 liquid asphalt conforming to AASHO M 81 or M 82.

CONCRETE. Concrete for curbs, sidewalks, pavement, and miscellaneous construction shall conform to ASTM C 94, Alternate 2, and shall have a design

mix proportioned for 3,000 pounds per square inch compressive strength at 28 days. Concrete mix shall contain no less than 5-1/2 sacks of cement per cubic yard. Maximum size of coarse aggregate shall be 1-1/2 inches. Slump shall be between 2 and 4 inches.

CONCRETE FORMS. All forms for curbs and sidewalks shall be either 2-inch dimensioned lumber, plywood, or metal forms. Forms on the face of the curb shall have no horizontal form joints within 11 inches of the top of the curb.

CURING COMPOUND. Approved commercial grade conforming to ASTM C 309, Type 1.

REINFORCING STEEL. Conform to ASTM A 615, Grade 40.

C. WORKMANSHIP.

CONSTRUCTION PROCEDURE. The Engineer reserves the right to vary the classes of backfill and the type of resurfacing as best serves the interest of the Owner. Trench backfill shall be as specified in Section TRENCH EXCAVATION AND BACKFILL.

In addition to the requirements set forth herein, the surface restoration shall conform to the applicable requirements for workmanship of the Yamhill County Road Department and the City of Newberg Road Department, and to the applicable portions of the Standard Specifications for Highway Construction of the Oregon State Highway Department, 1970 edition.

All applicable requirements concerning construction responsibilities and procedures shall apply.

REMOVAL OF PAVEMENT, SIDEWALK, CURBS, AND GUTTERS. Removal of all pavement, sidewalks, curbs, and gutters shall conform to Section TRENCH EXCAVATION AND BACKFILL, and payment for removal shall be included in that section.

STREET MAINTENANCE. Maintain all trenches as specified under Section TRENCH EXCAVATION AND BACKFILL.

ASPHALT CONCRETE PAVEMENT REPLACEMENT.

TEMPORARY ASPHALT COLD MIX. Remove as specified for pavement removal in Section TRENCH EXCAVATION AND BACKFILL.

SUBGRADE. Bring the trench to a smooth, even grade at the correct distance below the top of the existing pavement surface so as to provide adequate space for the base and/or 2-inch leveling course. Trim existing pavement to a straight line to remove any pavement which has been damaged or which is broken and unsound to provide a smooth, sound edge for joining the new pavement.

Compact the subgrade to 100 percent of the maximum density obtained in the Standard Proctor Test, AASHO T 99, Method D. Accomplish supplementary compaction where required with approved mechanical vibrating or power tampers.

LEVELING COURSE. Place, without segregating, enough leveling course material to obtain a thickness of 2 inches after compaction. Compact to the required depth of finished pavement and for proper matching with the adjacent existing pavement. Place the leveling course for the full width of the trench where pavement was disturbed, including bituminous surfaced shoulders.

Compact the leveling course to 100 percent of maximum density, AASHO T 99, Method D.

PRIME COAT. After the leveling course has been compacted, apply an asphalt prime coat, specified above, at 0.25 to 0.40 gallons per square yard to the surface of the leveling course and to the edges of the existing pavement.

ASPHALT CONCRETE. After the prime coat has set, but before it loses its adhering properties, place the hot plant-mix asphalt concrete on the prepared subgrade over the trench to a depth of not less than 2 inches or the depth of the adjacent pavement, whichever is greater. If the thickness is greater than 2-1/2 inches, place the surfacing in 2 lifts. The minimum depth for State highways shall be 4 inches. Spread and level the asphalt concrete with hand tools or by use of a mechanical spreader, depending upon the area to be paved. Bring the asphalt concrete to the proper grade and compact by rolling or the use of hand tampers where rolling is impossible.

Roll with power rollers capable of providing compression of 350 pounds per linear inch. Begin the rolling at the edges of the patch overlapping the existing surface at least 1/2 the width of the roller and progress toward the center of the resurfaced area. Overlap each preceding track by at least 1/2 the width of the roller and make sufficient passes over the entire area to produce the desired result, as determined by the Engineer.

The finished surface of the new paving shall be flush with the existing surface and shall conform to the grade and crown of the adjacent pavement.

SURFACE SMOOTHNESS. The surface smoothness of the replaced pavement shall be such that when a straightedge is laid across the patched area between the edges of the old surfacing and the surface of the new pavement, the new pavement shall not deviate from the straightedge more than 1/4 inch.

WEATHER CONDITIONS. Resurfacing will be permitted only during dry weather and while the trench conditions are satisfactory for pavement replacement. Exceptions will be permitted only in special cases and only with prior written approval of the Engineer.

PROTECTION OF STRUCTURES. Provide whatever protective coverings may be necessary to protect the exposed portions of bridges, culverts, curbs, gutters, posts, guard fences, road signs, and any other structures from splashing oil and asphalt from the paving operations. Remove any oil, asphalt, dirt, or any other undesirable matter that may come upon these structures by reason of the paving operations.

Where water valve boxes, manholes, catch basins, or other underground utility appurtenances are within the area to be surfaced, the resurfacing shall be level with the top of the existing finished elevation of these facilities. If it is evident that these facilities are not in accordance with the proposed finished surface, notify the Engineer to have the proper authority contacted in order to have the facility altered before proceeding with the resurfacing around the obstruction. Consider any delays experienced from such obstructions as incidental to the paving operation; no additional payment will be made.

EXCESS MATERIALS AND CONTRACTOR'S RESPONSIBILITY. Dispose of excess materials. Repair all settlement of pavement over Class D and F backfilled trenches within the warranty period at no additional cost to the Owner.

CONCRETE PAVEMENT. Pavement replaced shall be the same thickness as that removed, except that in no instance shall it be less than a minimum of 6 inches. Protect the newly placed concrete from traffic for a period of 7 days and cure by covering with burlap, sand, earth, or sawdust, which is kept continuously wet. Handle and place concrete pavement in accordance with the Standard Specifications for Highway Construction of the Oregon State Highway Department, 1970 edition.

ROCK SURFACING. Where so directed by the Engineer, place crushed rock surfacing material, as specified herein, for the full width of all streets, driveways, parking areas, street shoulders, and other areas disturbed by the construction. The areas covered, size of rock, and depth of application shall be as directed by the Engineer. Spread the rock by "tailgating" and supplement by hand labor where necessary. Level and grade the rock to conform to existing grades and surfaces.

SIDEWALKS, CURBS, AND DRIVEWAYS. Replace sidewalks, curbs, and asphalt driveways to the same section, width, depth, and to the same line and grade as that removed or damaged. Prior to replacing the sections, properly backfill and compact the trench to prevent subsequent settlement. Use a minimum 2-inch thick compacted leveling course of clean 3/4-inch minus rock or gravel under all sidewalks.

Replace concrete sidewalks between scored joints, and make replacement in a manner which will avoid a patched appearance. Finish all discontinuous edges of concrete curbs and sidewalks with suitable edging tool and groove. Finish curbs and sidewalks similar to the existing and abutting areas.

Tunneling under curbs and sidewalks is optional. However, should any subsequent cracking, subsidence, or any other indication of failure occur within the warranty period, the damaged section shall promptly be replaced at no additional cost to the Owner.

Replace asphalt driveways and walks as specified hereinbefore in Paragraph ASPHALT CONCRETE PAVEMENT REPLACEMENT.

D. PAYMENT. Payment for the work under this section will be based on the appropriate unit prices stated in the Contractor's Proposal. Payment shall constitute full compensation for furnishing all labor, materials, and equipment to complete the work as specified under this section.

ROCK SURFACING. Payment for replacement of rock surfacing will be based on the unit price per cubic yard for 3/4-inch rock as stated in the Contractor's Proposal. The quantity of rock replaced shall be the actual number of cubic yards used as directed by the Engineer, and shall be based on truck measure and trip tickets signed by the Engineer on the date of use. No payment will be allowed on trip tickets not so validated by the Engineer. The unit price for the rock shall include payment for excavating to provide space for the rock if necessary and disposal of all excess excavated material.

ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE PAVEMENT REPLACEMENT. When the trench center line crosses driveways or is under or at the edge of existing pavement, payment for asphalt concrete and portland cement surfacing will be based on the unit price bid per linear foot for the full width of the disturbed or damaged surface as stated in the Contractor's Proposal for each.

When the trench center line is 2 feet or less from the edge of the existing pavement, but not under or at the edge of the pavement, payment for resurfacing will be based on the unit price per square yard for each stated in the Contractor's Proposal for the actual area replaced. Payment, however, will be limited to pavement replaced within 2 feet of the trench center line. All pavement damaged outside these limits shall be replaced at the expense of the Contractor.

The unit prices shall include payment for excavation required to provide space for the surfacing, preparation of the trench, disposal of all excess excavated materials, and all other work required to complete the resurfacing. The 2-inch crushed rock leveling course will also be considered as included in the bid price per linear foot and in the bid price per square yard for pavement replacement as stated in the Contractor's Proposal.

Should the Contractor elect to tunnel under certain sections of pavement, payment will be made as though removal and replacement had been accomplished.

The unit price shall include payment for all required surface preparation, disposal of excess materials, and all other work required to complete the paving.

SIDEWALKS AND CURBS. Payment for concrete sidewalk replacement will be based on the unit price per square foot as stated in the Contractor's Proposal. Payment for sidewalk replacement will be limited to sidewalks replaced within 2 feet of the trench center line. All sidewalks damaged outside these limits shall be replaced at the expense of the Contractor.

Payment for concrete curb replacement will be based on the unit price per linear foot as stated in the Contractor's Proposal. Payment for curb replacement will be limited to curbs replaced within 2 feet of the trench center line. All curbs damaged outside these limits shall be replaced at the expense of the Contractor.

The 2-inch leveling course shall be included in the bid price per square foot or linear foot as stated in the Contractor's Proposal.

REMOVAL AND REPLACEMENT OF DRAINAGE CULVERTS. Payment for the removal and replacement of existing culverts will be based on the unit price per linear foot, irrespective of size, as stated in the Contractor's Proposal. Payment shall constitute full compensation for all work and material required to remove and replace the pipe and restore the culvert to at least its original condition and function. Replacement of existing culvert headwalls will also be included in this payment.

****

15A. CAST IRON PIPE AND FITTINGS

A. SCOPE. This section covers the work necessary for furnishing and installing the cast iron pipe and fittings, complete.

Reference herein is made to the latest editions of standards, tests, methods, and specifications of research and technical organizations as follows:

Item	Standard Specification, Test, or Method Designation
Cast iron pipe and fittings	Federal Specification WW-P-421 ASA A21.4, A21.6, A21.10, A21.11
Flanged pipe and fittings	Federal Specification WW-P-421 ASA B16.1
Ductile iron pipe	ASA A21.51, 1965

References to ASTM, AWWA, ASA, or Federal Specifications shall be understood to mean the latest standard or specification, unless otherwise stated.

B. MATERIALS.

JOINTS. Pipe joints shall be push-on joints. Fitting joints shall be mechanical joint ends, except where specifically shown or detailed otherwise.

PUSH-ON JOINT CAST IRON PIPE. Push-on joint cast iron pipe shall be cement-mortar lined and conform to ASA A21.6 and ASA A21.11, and shall be U. S. Tyton joint pipe, as manufactured by United States Pipe and Foundry Company and Pacific States Cast Iron Pipe Company, or as approved. The type and thickness class shall be 22. The rubber-ring gaskets shall conform to ASA A21.11, be suitable for the specified pipe sizes and pressures, and shall be furnished with the pipe. A nontoxic vegetable soap lubricant shall be supplied in sufficient quantities for installing the pipe furnished.

MECHANICAL JOINT FITTINGS. Mechanical joint cast iron fittings shall conform to AWWA C110 and shall be of a class at least equal to that of the adjacent pipe. No mortar lining is required on fittings.

FLANGED CAST IRON PIPE. Flanged cast iron pipe shall be cement-mortar lined and shall conform to ASA A21.6 as to metal thickness and quality, and the cement lining to ASA A21.4. The thickness class shall be 22. Flanges shall be screw type, faced and drilled 125-pound ASA. Flanges and bolts shall conform to ASA B16.1.

FLANGED CAST IRON FITTINGS. Flanged fittings shall conform to ASA B16.1 and shall be faced and drilled 125-pound ASA.

GASKETS. Gasket material for flanged joints in cast iron pipe shall be cloth-inserted sheet rubber gaskets conforming to AWWA C207 and ASA B16.21,

1/8-inch thick. The gasket shall extend from the inside diameter of the flange to at least the inside edge of the bolt. Gasket material shall be free from corrosive alkali or acid ingredients.

HANDLING. Handle the pipe so as to prevent injury to the coating. Place no pipe or other material inside any other pipe at any time after it has been coated.

COUPLINGS. The proper size coupling shall be determined in the field by the Contractor. Couplings indicated on the Drawings are from the best available data and are used to indicate the type of connection.

MECHANICAL COUPLINGS. Mechanical couplings, not a part of the pipe itself, shall be cast iron couplings with rubber rings and ductile iron bolts and nuts. Couplings shall be Smith-Blair or as approved.

FLANGED COUPLING ADAPTERS. Coupling adapters shall be provided with rubber rings and ductile iron bolts and nuts, and shall have anchor studs. Coupling adapters shall be Smith-Blair or as approved.

TRANSITION OR REDUCING COUPLINGS. Transition or reducing couplings, not a part of the pipe itself, shall be cast iron couplings with rubber rings and ductile iron bolts and nuts. Transition couplings and reducing couplings shall be Smith-Blair or as approved.

IMPORTED GRANULAR MATERIAL FOR PIPE BASE AND PIPE ZONE. Use clean pea gravel or crushed rock with a maximum size of 3/4 inch, uniformly graded from coarse to fine. Clean beach, pit-run, or reject crusher-run sand may be substituted for gravel in trenches with no groundwater in the pipe zone. Submit samples to the Engineer for approval.

SELECTED TRENCH SIDE MATERIAL FOR PIPE BASE AND PIPE ZONE. Selected trench side material used for backfill in the pipe zone shall contain no rock, frozen soil, or other piece of material larger than 1-1/2 inches.

C. WORKMANSHIP.

PREPARATION OF TRENCH.

GRADE. Grade the bottom of the trench by hand to the line and grade to which the pipe is to be laid, with proper allowance for pipe thickness and for gravel cushion when specified or indicated. Before laying each section of the pipe, check the grade with a straightedge and correct any irregularities found. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between bell holes, except that the grade may be disturbed for the removal of lifting tackle.

NONIMPORTED BASE. If, in the Engineer's opinion, the trench excavation has material suitable for pipe bedding, grade the bottom of the trench by hand with a uniform bedding of selected trench side material, 4 inches in thickness, placed and leveled to grade in advance of the pipe laying. If the trench is overexcavated, rebuild the overexcavated section of the trench with imported pipe base at no additional cost to the Owner.

IMPORTED GRANULAR BASE. Provide imported granular base under all pipe where, in the opinion of the Engineer, material satisfactory for fine grading and bedding the pipe is not available at the trench. Imported base will be used principally where groundwater conditions make the use of a lesser base impractical. Place granular base for pipe in the trench to a minimum depth of 6 inches. Trenches to be provided with a granular base for pipe will be designated by the Engineer during construction. Grade the top of the base to the bottom of the pipe ahead of pipe laying for the full width of the trench. Base shall provide a firm, unyielding support along entire pipe length.

BELL (JOINT) HOLES. At the location of each joint, dig bell (joint) holes of ample dimensions in the bottom of the trench and at the sides where necessary to permit the joint to be made properly and to permit easy visual inspection of the entire joint.

REMOVAL OF WATER. Provide and maintain ample means and devices at all times to remove and dispose of all water entering the trench excavation during the process of pipe laying.

LAYING.

DISTRIBUTING PIPE. Distribute material on the job from the cars or storage yard no faster than can be used to good advantage. In general, distribute no more than one week's supply of material in advance of the laying.

HANDLING MATERIAL. Provide and use proper implements, tools, and facilities satisfactory to the Engineer for the safe and convenient prosecution of the work. Lower all pipe, fittings, and appurtenances into the trench, piece by piece, by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to the pipeline materials and protective coatings and linings. Do not drop or dump pipeline materials into the trench.

CLEANING PIPE AND FITTINGS. Remove all lumps, blisters, and excess coal-tar coating from the bell-and-spigot ends of each pipe. Wire brush the outside of the spigot and the inside of the bell and wipe clean, dry, and free from oil and grease before the pipe is laid.

Wipe the ends of mechanical joint pipe and fittings and of rubber gasket joint pipe and fittings clean of all dirt, grease, and foreign matter.

PLACING OF PIPE IN THE TRENCH. Do not allow foreign material to enter the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into the pipe, the Engineer may require that a heavy, tightly woven canvas bag of suitable size be placed over each end before lowering the pipe into the trench and left there until the connection is to be made to the adjacent pipe. During laying operations, prevent debris, tools, clothing, or other materials from entering the pipe.

PUSH-ON JOINT PIPE. After the first length of push-on joint pipe is installed in the trench, secure pipe in place with approved backfill

material tamped under and along sides to prevent movement. Keep ends clear of backfill. After each section is joined, place backfill as specified to prevent movement.

MECHANICAL JOINT AND PUSH-ON JOINT PIPE. Connect mechanical joint pipe and push-on joint pipe as hereinafter specified as soon as they are placed in the trench.

PREVENTING TRENCH WATER FROM ENTERING PIPE. At times when pipe laying is not in progress, close the open ends of pipe by a watertight plug or other means approved by the Engineer, and allow no trench water to enter the pipe. Caulk joints of pipe in the trench which cannot be poured with packing to make them as watertight as possible. These provisions shall apply during the noon hour as well as overnight. If water is in the trench, keep the seal in place until the trench is pumped dry.

CUTTING PIPE.

GENERAL. Cut pipe for inserting valves, fittings, or closure pieces in a neat and workmanlike manner without damaging the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.

CAST IRON PIPE. Cut pipe with milling-type cutter, rolling pipe cutter, or with sledge and cold cutter. Do not flame cut.

DRESSING CUT ENDS. On rubber gasket joint pipe, grind back the outside of the cut or dress as recommended by the pipe manufacturer and approved by the Engineer.

BELL END TO FACE DIRECTION OF LAYING. Unless otherwise directed, lay pipe with bell end facing in the direction of the laying. For lines on an appreciable slope, face bells upgrade (at the discretion of the Engineer).

PERMISSIBLE DEFLECTION AT JOINTS. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions or plumb stems, or where long-radius curves are permitted, the amount of deflection allowed shall not exceed that approved by the Engineer. Maximum permitted deflections are indicated hereinafter.

(See next page)

Maximum Deflection Permitted

18' Length Pipe

D	Bell & Spigot *		Mechanical Joint**		Push-On Joint	
	Max. Defl. Angle	Defl. in Inches	Max. Defl. Angle	Defl. in Inches	Max. Defl. Angle	Defl. in Inches
4"	4°20'	16.7	8°18'	31	5°	18
6"	4°20'	16.7	7°07'	27	5°	18
8"	3°50'	14.6	5°21'	20	5°	18
10"	3°40'	14.0	5°21'	20	5°	18
12"	3°10'	11.9	5°21'	20	5°	18
14"	2°40'	10.1	3°35'	13-1/2	3°	11

The maximum deflection shall be whichever is less, the above or that recommended by the pipe manufacturer.

*--Limiting factors: (1) Joint opening not to exceed 0.75 inch.
(2) Caulking space at face of bell to be not less than 0.25 inch in width.

**--Safe deflection for 150 pounds pressure. For higher pressure, reduce tabulated deflection 10 percent for each 150 pounds added pressure.

ALIGNMENT. For pipelines intended to be straight, do not deviate from the straight line at any joint in excess of 1 inch.

UNSUITABLE CONDITIONS FOR LAYING PIPE. Do not lay pipe in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

JOINTING MECHANICAL JOINT FITTINGS. Mechanical joint fittings vary slightly with different manufacturers. Install the particular fitting furnished in accordance with the manufacturer's recommendations as approved by the Engineer. In general, the procedure shall be as hereinafter specified. Clean the ends of the pipe of all dirt, mud, and foreign matter by washing with water and scrubbing with a wire brush, after which slip the gland and gasket on the plain end. If necessary, lubricate the pipe end with soapy water to facilitate sliding the gasket in place. Then guide the end of the pipe into the bell of the fitting. Locate the spigot centrally in the bell, place the gasket in position, and insert the bolts in the holes.

Torque ranges to be applied to bolts and wrench lengths which should produce the required torque when applied by the average man should be as follows:

Diameter of Bolt - In.	Torque Range Ft. - Lbs.	Wrench Length - In.
5/8	40 - 60	8
3/4	60 - 90	10
1	70 - 100	12
1-1/4	90 - 120	14

When tightening bolts, bring the gland up toward the flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. Tighten all nuts progressively a little at a time. Do not overstress bolts to compensate for poor alignment. If effective sealing is not attained at the maximum torque, disassemble the joint and reassemble after cleaning.

INSTALLATION OF DUCTILE IRON RETAINER GLANDS ON MECHANICAL JOINT PIPE AND FITTINGS. Install in accordance with the pipe manufacturer's printed instructions. Use torque wrench for correct tightening of set screws.

JOINTING PUSH-ON JOINT PIPE. Lay and joint pipe with push-on type joints in strict accordance with the manufacturer's recommendations as approved by the Engineer. Provide all special tools and devices, such as special jacks, chokers, and similar items required for the installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted under any circumstances.

PROTECTION FOR FLANGE ADAPTER OR MECHANICAL COUPLED JOINTS. No protection will be required for cast iron adapters or couplings. Clean all steel flange adapter or mechanical coupled joints after assembly by wire brushing, and give 2 coats of Koppers Bitumastic No. 505 to a minimum dry film thickness of 30 mils.

ANCHORAGE.

LIMITING PIPE DIAMETER AND DEGREE OF BEND. On all pipelines 4 inches in diameter or larger, securely anchor by suitable thrust blocking, all tees, plugs, caps, and bends exceeding 22-1/2 degrees, as shown, and at other locations where unbalanced forces exist, as directed by the Engineer. See Standard Detail No's. 100 and 111.

THRUST BLOCKING. Provide reaction or thrust blocking as shown. The concrete mix shall not be leaner than 1 cement, 2-1/2 sand, 5 stone, and shall have a compressive strength of not less than 2,000 pounds per square inch. Place blocking between the undisturbed ground and the fitting to be anchored. The quantity of concrete and the area of bearing on the pipe shall be as shown or as directed by the Engineer. Place the blocking so that the pipe and fitting joints will be accessible to repairs, unless otherwise shown.

DEFINITION OF PIPE ZONE. The pipe zone shall include the full width of the trench from the bottom of the pipe to a point 6 inches above the top of the pipe barrel.

SELECTED TRENCH SIDE MATERIAL AT PIPE ZONE. After the pipe is in place and ready for backfilling, place SELECTED TRENCH SIDE MATERIAL FOR PIPE ZONE at approximately the same rate on each side of the pipe such that the elevation of the backfill on each side of the pipe is approximately equal at all times. Compact the backfill by tamping by hand or pneumatic tampers in 6-inch lifts. Each layer shall be compacted to at least 90 percent of its maximum density as determined by AASHO T 99, Method C. Particular attention shall be given to the backfilling and tamping procedures to insure that no unfilled or uncompacted areas occur beneath the pipe.

IMPORTED GRANULAR BACKFILL AT PIPE ZONE. When, in the opinion of the Engineer, insufficient or unsuitable material exists at trench side for selected pipe zone material, import and place imported granular backfill as hereinbefore specified. The imported granular material shall be placed and compacted in the same manner specified for SELECTED TRENCH SIDE MATERIAL. Extra payment for placing imported granular material backfill in the pipe zone will be made only when the Engineer has directed that the material be provided and placed.

HYDROSTATIC TESTS. Make pressure and leakage tests on all newly laid pipe. Test all sections of pipe separately that can be isolated by valves and/or dead ends, except for fire hydrant branches. Fire hydrant auxiliary valves shall be open during the tests. Furnish all necessary equipment and material, make all taps in the pipe as required, and conduct the tests. The Engineer will monitor the tests.

Furnish the following equipment and materials for the tests:

2 Approved graduated containers.
2 Pressure gauges.
1 Hydraulic force pump as approved by the Engineer.
Suitable hose and suction pipe as required.

Conduct the tests after the trench has been backfilled or partially backfilled with the joints left exposed for inspection, or when completely backfilled, as permitted by the Engineer. Where any section of pipe is provided with concrete reaction blocking, do not make the pressure test until at least 5 days have elapsed after the concrete thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be cut to 2 days.

Conduct the pressure test in the following manner, unless otherwise approved by the Engineer: After the trench has been backfilled or partially backfilled as hereinbefore specified, fill the pipe with water. The test pressure shall be 150 pounds per square inch at the low points in the line.

DURATION. The duration of each pressure test shall be 30 minutes, unless otherwise directed by the Engineer.

EXPELLING AIR. Before applying the specified test pressure, expel all air from the pipe.

PROCEDURE. Fill the pipe with water and apply the specified test pressure by pumping, if necessary.

Then valve off the pump and hold the pressure in the line for the test period. At the end of the test period, operate the pump until the test pressure is again attained. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to restore the test pressure may be measured accurately.

LEAKAGE. Leakage shall be defined as the quantity of water necessary to restore the specified test pressure at the end of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

$$L = \frac{NDP^{\frac{1}{2}}}{5,500}$$

in which

L = allowable leakage in gallons per hour
N = number of joints in the length of pipe tested
D = nominal diameter of pipe in inches
P = average test pressure during the leakage test in pounds per square inch.

CORRECTION OF LEAKAGE. Should any test of pipe laid disclose leakage greater than that allowed, in accordance with the above formula, locate and repair the defective joints or pipe until the leakage of a subsequent test is within the specified allowance and there is no visible leakage.

FLUSHING. Before sterilizing, flush all foreign matter from the pipeline. Provide hoses, temporary pipes, ditches, etc. as required to dispose of flushing water without damage to adjacent properties. Flushing velocities shall be at least 2.5 fps. For large diameter pipe where it is impractical or impossible to flush the pipe at 2.5 fps velocity, clean the pipeline in place from the inside by brushing and sweeping, then flush the line at a lower velocity.

STERILIZATION. Pipelines intended to carry potable water shall be sterilized before placing in service. Sterilizing procedures shall conform to AWWA C601 as hereinafter modified or expanded.

STERILIZING MIXTURE. Shall be a chlorine-water solution having a free chlorine residual of 50 ppm. The sterilizing mixture shall be prepared by injecting: 1) a liquid chlorine gas-water mixture; 2) dry chlorine gas; or 3) a calcium or sodium hypochlorite and water mixture into the pipeline at a measured rate while fresh water is allowed to flow through the pipeline at a measured rate so that the combined mixture of fresh water and chlorine solution or gas is of the specified strength.

The liquid chlorine gas-water mixture shall be applied by means of an approved solution feed chlorinating device. Dry chlorine gas shall be fed through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder.

If the calcium hypochlorite procedure is used, first mix the dry powder with water to make a thick paste, then thin to approximately a 1 percent solution (10,000 ppm chlorine). If the sodium hypochlorite procedure is used, dilute the liquid with water to obtain a 1 percent solution. The following proportions of hypochlorite to water will be required:

Product	Quantity	Water
Calcium Hypochlorite (1) (65 - 70% Cl)	1 lb.	7.5 gal.
Sodium Hypochlorite (2) (5.25% Cl)	1 gal.	4.25 gal.

(1) Comparable to commercial products known as HTH, Perchloron, and Pittchlor.
(2) Known as liquid laundry bleach, Chlorox, Purex, etc.

All pipe and fittings used for making connections to existing pipelines shall be sprayed with a solution containing sufficient chlorine to provide a free chlorine residual of 200 ppm, prior to installation.

POINT OF APPLICATION. Inject the chlorine mixture into the pipeline to be treated at the beginning of the line through a corporation stop or suitable tap in the top of the pipeline. Water from the existing system or other approved source shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the combined mixture shall contain 50 ppm of free available chlorine. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Use check valves if necessary.

RETENTION PERIOD. Treated water shall be retained in the pipeline long enough to destroy all nonspore-forming bacteria. With proper flushing and the specified solution strength, 24 hours is adequate. At the end of the 24-hour period, the sterilizing mixture shall have a strength of at least 10 ppm of chlorine.

Operate all valves, hydrants, and other appurtenances during sterilization to assure that the sterilizing mixture is dispersed into all parts of the line, including dead ends, new services, and similar areas that otherwise may not receive the treated water.

Do not place concentrated quantities of commercial sterilizers in the line before it is filled with water.

After chlorination, flush the water from the line until the water through the line is equal chemically and bacteriologically to the permanent source of supply.

DISPOSAL OF STERILIZING WATER. Dispose of sterilizing water in an approved manner. Do not allow sterilizing water to flow into a waterway without adequate dilution or other satisfactory method of reducing chlorine concentrations to a safe level.

D. PAYMENT.

PIPE. Payment for furnishing and installing the cast iron pipe will be made at the unit price per linear foot stated in the Proposal. This payment shall constitute full compensation for all work specified under this section.

The measure for payment will be the field measured center line length of the pipe in place.

No payment for pipe in place will be made until the pipe has successfully passed the leakage test.

The Engineer will withhold full payment on any section of pipe deemed unsatisfactory due to excessive leakage or any other causes until such defects have been corrected in accordance with these Contract Documents and are acceptable to the Engineer.

CAST IRON FITTINGS. Payment for cast iron fittings will be made at the unit price per pound stated in the Contractor's Proposal for each type of fitting therein stated.

Measurement for payment of each type of fitting will be based upon the weight of each type of fitting furnished and installed. Whenever possible, the weight of cast iron fittings shall be the theoretical weight of the size and type of fitting, as listed in AWWA C110. The weight of all other cast iron fittings shall be as listed by the fabricator or supplier of the particular fitting. If the weight of a particular fitting is unavailable from the above sources, the Contractor shall have the fitting weighed. Weigh tickets shall be presented to the Engineer for verification and his records. Retainer glands will be measured for payment only to the extent that their weight exceeds that of a standard mechanical-joint gland. Standard joint accessories and cut sections of pipe will not be measured for payment as fittings.

MECHANICAL COUPLINGS. Payment for steel and cast iron mechanical couplings will be made at the unit price per diameter-inch stated in the Contractor's Proposal for each coupling furnished and installed as a permanent part of the system. The term "mechanical couplings" shall also include transition and reducing couplings.

Measurement for payment of mechanical couplings will be based upon the nominal diameter, in inches. Measurement for payment of transition and reducing mechanical couplings will be based on the nominal diameter, in inches, of the larger of the two openings.

FLANGED COUPLING ADAPTERS. Payment for steel and cast iron flanged coupling adapters will be made at the unit price per diameter-inch stated in the Contractor's Proposal for each coupling furnished and installed as a permanent part of the system.

Measurement for payment of flanged coupling adapters will be based on the nominal diameter, in inches.

IMPORTED GRANULAR PIPE BASE AND PIPE ZONE MATERIAL. Payment for imported granular material for the pipe base and pipe zone will be made at the unit price per linear foot stated in the Proposal. Since payment for placing and compacting the pipe base and pipe zone backfill is already included in PIPE, payment for imported granular backfill at the pipe base and pipe zone under this item shall be considered full payment for all materials, labor, equipment, and incidentals necessary to furnish and place the material at trench side and for any extra costs in handling or placing the pipe base and pipe zone.

The measurement for payment will be the horizontal distance along the center line of the pipe and fittings in place, regardless of trench width.

Imported granular material will be paid for only when authorized by the Engineer.

****

15B. CONCRETE CYLINDER PIPE AND FITTINGS

A. SCOPE. This section covers the work necessary for furnishing and installing concrete cylinder pipe and fittings, complete.

The term "concrete cylinder pipe" shall be understood to include all special pieces and related parts necessary for the complete installation as shown. Special pieces shall include, but not be limited to, fittings, bends, outlets, branches, closure sections, and all other concrete cylinder piping required to complete the work.

Rigid joints, where shown, shall be flanged or field-welded standard joints, as required.

B. MATERIALS.

CONCRETE CYLINDER PIPE. Concrete cylinder pipe shall conform to AWWA C 303-70, Reinforced Concrete Water Pipe - Steel Cylinder Type, Pretensioned.

SHOP DRAWINGS. Before starting fabrication, furnish the Engineer with shop drawings in quadruplicate. Shop drawings shall consist of a marking plan, based on the construction plans, showing the location of each pipe section and each special piece. Each pipe section and special piece shall be designated in sequence on the marking plan. Shop drawings shall show details of a standard pipe section and details of all special pieces, including dimensions, plate thicknesses, coating and lining thicknesses, laying lengths, outlet lengths, and other pertinent information. Pipe shall be furnished and installed in accordance with the approved marking plan.

CERTIFICATION. Certifications properly executed by the manufacturer shall be furnished to the Engineer showing compliance to the required Specifications. Test data on tests performed shall be provided as requested by the Engineer.

CLASSIFICATION. Concrete cylinder pipe shall have an internal diameter of 12, 16, and 24 inches and shall be designed for a maximum water working pressure of 150 psi, 150 psi, and 100 psi, respectively.

LONGITUDINAL STRESS. Where pipe and/or fittings are subjected to longitudinal stresses induced by thrust ties or thrust blocks, the longitudinal steel area (cylinder thickness) shall be increased, if necessary, to prevent the cylinder stress from exceeding the minimum yield point with a differential pressure equal to 2-1/4 times the design pressure at the restrained location.

CEMENT. The total alkali content, when determined as the mixed sulphates of sodium and potassium and calculated to sodium oxide, shall not exceed 0.6 of 1 percent.

JOINT LUBRICANT. Furnish joint lubricant with the pipe. Furnish the amount and type recommended by the pipe manufacturer. The lubricant shall be a water-soluble, nontoxic, vegetable soap compound conforming to United States Pharmacopeoia No. P 39.

FLANGED JOINTS. Flanges for Class 100 and Class 150 pipe, and pipe of intermediate design pressures shall be steel-ring flanges, Class D, conforming to AWWA C207.

PLAIN ENDS. Where mechanical couplings are shown, provide plain ends on pipe and/or special pieces. Plain ends shall be at least 8 inches long, shall have wall thicknesses not less than specified for special pieces, and shall be such that when the field joint is made, including welds, the joint shall be at least equal in strength to the adjoining pipe section. The OD of the plain end section shall be such that the joint can be coupled with a mechanical coupling. Protect plain ends with at least one coat of Amercoat No. 25, or as approved.

JOINT SWAB. Furnish sufficient swabs of the proper size and shape for use by the installation contractor to remove excess mortar from the joints inside pipes with diameters less than 24 inches. These swabs shall be of rubber and capable of being inflated to the proper size for their intended use. The swabs shall be equipped with rings, straps, or similar devices which will permit a rope or cable to be attached to pull the swab through the pipe without deforming the swab to the point where the inside joint is not wiped clean.

INSPECTION. The Engineer and his representatives shall have access to all phases of the work and the manufacturer shall provide proper facilities for access and inspection. Material, fabricated parts, and pipe which are discovered to be defective, or which do not conform to the requirements of this Special Specification will be subject to rejection at any time prior to final acceptance of the pipe.

MECHANICAL, TRANSITION, OR REDUCING COUPLINGS. Couplings shall be Smith-Blair or as approved.

FLANGED COUPLING ADAPTERS WITH ANCHOR STUDS. Adapters shall be Smith-Blair or as approved.

COUPLINGS. The proper size coupling shall be determined in the field by the Contractor. Couplings indicated on the drawings are from the best available data and are used to indicate the type of connection.

STEEL PIPE FOR CLOSURE SECTIONS. Steel pipe for closure sections shall conform to AWWA C201, except that the pipe shall be mortar-lined to the same thickness as the cylinder pipe. Alternate closure section designs may be submitted for approval.

BONDING MATERIALS. Bond bars shall be 5/16-inch diameter mild steel rod.

WELDING MATERIALS. Welding materials shall conform to AWWA C206.

NUTS, BOLTS, AND GASKETS. Nuts and bolts shall be of the sizes and quantities recommended in AWWA C207. Gaskets for flanged joints shall be cloth-inserted sheet rubber gaskets conforming to AWWA C207 and ASA B16.21,

1/8 inch thick. The gasket shall extend from the inside diameter of the flange to at least the inside edge of the bolt. Gasket material shall be free from corrosive alkali or acid ingredients.

CONCRETE FOR THRUST BLOCKING. Plant-mix concrete, conforming to ASTM C 94, Alternate 2, developing a 28-day compressive strength of at least 2,000 psi.

FLANGES. Flanges shall be steel-ring flanges or steel hub flanges as required for the class of pipe to which they are attached. All valves shall be connected to the pipe by means of flanges.

IMPORTED GRANULAR MATERIAL FOR PIPE BASE AND PIPE ZONE. For pipe 36 inches in diameter and smaller use clean pea gravel or crushed rock with a maximum size of 3/4 inch, uniformly graded from coarse to fine. Clean beach, pit-run, or reject crusher-run sand may be substituted for gravel in trenches with no groundwater in the pipe zone. Submit samples to the Engineer for approval.

SELECTED TRENCH SIDE MATERIAL FOR PIPE ZONE. Selected trench side material used for backfill in the pipe zone shall contain no rock, frozen soil, or other piece of material larger than 1-1/2 inches.

C. WORKMANSHIP.

GENERAL. Stationing shown on the Plans is approximate only. Contractor should field verify actual measurements. Fitting connections and closures shall be made with approved closure pieces or shop-fabricated lengths of pipe certified in the field by the Contractor.

HANDLING MATERIAL. Pipe shall not be stored under conditions which would cause injurious drying out of the mortar coatings. When necessary, stored pipe shall be protected by means of shelter and application of water. Deliver the pipe to the site of the work no more than 7 calendar days in advance of laying the pipe. No pipe shall be hauled to the site of the work until it has been fully cured as specified.

Lifting of pipe shall be done using at least two slings placed at the quarter points of the pipe sections. The slings shall bear uniformly against the pipe. When not being handled, the pipe shall be supported on timber cradles or on properly prepared ground, graded to eliminate all rock points and to provide uniform support along the full length. When being transported, the pipe shall be supported at all times in a manner which will not permit distortion or damage to the lining or coating. Any unit of pipe that, in the opinion of the Engineer, is damaged beyond repair by the Contractor shall be removed from the site of the work and replaced with another unit. No payment will be made for damaged pipe or for repairs to such damaged pipe.

PREPARATION OF TRENCH.

NONIMPORTED BASE. If, in the Engineer's opinion, the trench excavation has material suitable for pipe bedding, grade the bottom of the trench by hand with a uniform bedding of selected trench side material 4 inches

in thickness placed and leveled to grade in advance of the pipe laying. If the trench is overexcavated, rebuild the overexcavated section of the trench with imported pipe base at no additional cost to the Owner.

IMPORTED GRANULAR BASE. Provide imported granular base under all pipe where, in the opinion of the Engineer, material satisfactory for fine grading and bedding the pipe is not available at the trench. Imported base will be used principally where groundwater conditions make the use of a lesser base impractical. Place granular base for pipe in the trench to a minimum depth of 6 inches. Trenches to be provided with a granular base for pipe will be designated by the Engineer during construction. Grade the top of the base to the bottom of the pipe ahead of pipe laying for the full width of the trench. Base shall provide a firm unyielding support along entire pipe length.

BELL (JOINT) HOLES. At the location of each joint, dig bell (joint) holes in the bottom of the trench and at the sides where necessary to permit the joint to be made as specified and to permit visual inspection of the entire joint.

LAYING.

LAYING PLAN. Furnish laying plan prior to delivery of material. Lay the pipe and fittings in accordance with the marking plan, except as modified by the Engineer.

PLACING OF PIPE IN THE TRENCH. Prevent foreign material from entering the pipe while it is being placed in the trench. Remove all foreign material from the pipe or joint ring before the next pipe is placed. If the pipe-laying crew cannot put the pipe into the trench and in place without getting earth into the pipe, the Engineer may require that snugly fitted, tightly-woven, canvas bags be placed over each end before lowering the pipe. The bags shall be left in place until the connection is to be made to the adjacent pipe. During laying operations, keep debris, tools, clothing, or other materials out of the pipe.

Place the backfill carefully and simultaneously on both sides of the pipe to avoid displacement of the pipe and damage to the joints and mortar coating. Follow pipe-laying operations closely with outside grouting operations and backfilling of the trenches with sufficient material to prevent the pipe from floating. Schedule work so that at no time will pipe remain in the trench more than 1 day before being covered with backfill, unless otherwise approved by the Engineer.

UNSUITABLE CONDITIONS FOR LAYING PIPE. Do not lay pipe in water, or when, in the opinion of the Engineer, trench conditions are unsuitable.

JOINTING.

INSTALLATION. Point the bell end of the pipe in the direction of laying. As the next section of pipe is being readied for laying, clean the bell of the previously laid pipe of all foregin material, and "butter" the inside face of the bell with a mortar composed of 1 part portland cement

to not more than 3 parts fine aggregate. At the same time, lubricate the rubber gasket and install in the spigot groove. The gasket tension shall be uniform around the groove before placing the pipe in the trench. Lower the pipe section to be laid into the trench until it is approximately in line with the previously laid pipe section and the spigot is centered in the bell. Then force the pipe home and secure to proper alignment and grade with approved backfill material, well tamped. Use wood wedges as required to hold the joint open a distance sufficient to check the placement of the gasket. The rubber gasket shall be checked with a feeler gauge to assure proper seating. After the pipe is in place, pull the joint swab past the joint to remove any excess mortar that may be squeezed into the interior of the pipe.

ALIGNMENT. Pipelines intended to be straight shall be so laid, and in no case shall a deviation from a straight line exceed one inch. Where pipelines are to be laid on a curve by means of unsymmetrical closure of spigot into bell rings, the deflections shall not exceed the maximum allowable deflections as follows:

Pipe Size Range	Max. Deflection Angle
10 - 14	2°30'
16 - 21	1°50'
24 - 33	1°30'
36 - 48	1°00'
48 - 60	0°45'

STANDARD JOINT PROTECTION. After the pipe section has been laid, clean the exposed metal at the exterior space at the joint and fill the annular space with a portland cement grout, composed of one part cement to one part fine aggregate with sufficient water to form a mixture the consistency of thick cream. Wrap the joint with a strip of medium, coarse, woven fabric and band around the pipe at each side of the joint. The fabric shall be of such a weave as to allow the escape of air and excess water but prevent escape of mortar. Pour the joint full of grout through a space in the woven fabric slightly to one side of the top. Rod the grout with a beaded wire or chain as it is poured into the joint. Immediately after completing the exterior joint, place damp earth over and around the joint to prevent rapid drying. Styrofoam "diapers" with integral banding may be used subject to prior approval by the Engineer of the design and method of use.

PROTECTION FOR FLANGED OR MECHANICALLY COUPLED JOINTS. Clean all flanged or mechanical coupled joints after assembly by wire brushing, and give 2 coats of Kopper's Bitumastic No. 505 to a minimum dry film thickness of 30 mils.

CLOSING PIPE ENDS. At times when pipe laying is not in progress, close the open end of pipe with a watertight plug, or by other means approved by the Engineer, to preclude rapid drying of the interior joint mortar and to prevent trench water from entering the pipe. If water is in the trench, keep the seal in place until the trench is pumped free of water.

WELDED JOINTS AND FLANGED JOINTS. Make field-welded joints in accordance with AWWA C206, or as shown, or both. Joint protection on field-welded joints shall be as specified for the standard joint.

Make up flanged joints using the specified bolts, nuts, and gaskets. Before tightening the nuts, the two faces of the flanges shall be parallel and firmly against the gasket. Tighten all nuts progressively a little at a time. Do not overstress bolts to compensate for poor alignment of the flanges.

INSTALLATION OF BOND BARS. Two bond-bar jumper rods shall be welded at each joint in conformance with the details of the Plans.

ELECTRIC CONTINUITY TEST. At the completion of the pipeline installation, The Engineer will make tests to insure that the pipeline and test lead stations have electrical continuity throughout the length of the pipeline. If the pipe does not pass the tests, the Contractor shall uncover the joints and correct the deficiency.

ANCHORAGE.

LOCATION OF THRUST BLOCKING. All pipeline tees, plugs, caps, bends, and other locations where unbalanced forces exist shall be anchored by thrust blocking as shown or specified.

THRUST BLOCKING. Place thrust blocking between undisturbed ground and the fitting to be anchored. The quantity of concrete and the area of bearing on the pipe shall be as shown or directed. Place the blocking so that the pipe and fitting joints will be accessible for repairs, unless otherwise directed. See Standard Details 100 and 111.

FLANGED OR WELDED JOINTS. Thrust blocking at fittings where flanged or welded joints transmit the reaction to the pipeline may be either reduced or eliminated as permitted by the Engineer.

BACKFILL AT PIPE ZONE.

DEFINITION OF PIPE ZONE. The pipe zone shall include the full width of the trench from the bottom of the pipe to a point 6 inches above the top of the pipe barrel.

SELECTED TRENCH SIDE MATERIAL AT PIPE ZONE. After the pipe is in place and ready for backfilling, place SELECTED TRENCH SIDE MATERIAL FOR PIPE ZONE at approximately the same rate on each side of the pipe such that the elevation of the backfill on each side of the pipe is approximately equal at all times. Compact the backfill by tamping by hand or pneumatic tampers in 6-inch lifts. Each layer shall be compacted to at least 90 percent of its maximum density as determined by AASHO T 99. Particular attention shall be given to the backfilling and tamping procedures to insure that no unfilled or uncompacted areas occur beneath the pipe.

IMPORTED GRANULAR BACKFILL AT PIPE ZONE. When, in the opinion of the Engineer, insufficient or unsuitable material exists at trench side for

selected pipe zone material, import and place imported granular backfill as hereinbefore specified. The imported granular material shall be placed in the same manner specified for SELECTED TRENCH SIDE MATERIAL, except that compacting by tamping will not be required. Extra payment for placing imported granular material backfill in the pipe zone will be made only when the Engineer has directed that the material be provided and placed.

SUBSTITUTION OF BASE AND PIPE ZONE MATERIALS. The Contractor may, at his option, substitute IMPORTED GRANULAR MATERIAL FOR PIPE BASE AND PIPE ZONE in lieu of the tamped SELECTED TRENCH SIDE MATERIAL FOR PIPE ZONE AND PIPE BASE for the pipe base and backfill in the pipe zone. It is understood and agreed that the Contractor shall not receive payment for IMPORTED GRANULAR MATERIAL FOR PIPE BASE AND PIPE ZONE where this material by the Contractor's choice is used in lieu of the tamped native material.

TIME INTERVAL BEFORE FILLING PIPE. Do not fill pipe with water within 12 hours of the time the last joint has been completed and the interior mortar placed. Do not subject the pipe to internal hydrostatic pressure until all joints have aged at least 36 hours.

HYDROSTATIC TESTS. Make pressure and leakage tests on all newly laid pipe and valved section of it. Tests shall be made on two or more valved sections not to exceed 1,000 feet when this procedure is acceptable to the Engineer. Furnish all necessary equipment and material, make all taps, and furnish all closure pieces in the pipe as required. On open-end sections of pipe, provide the necessary plugs and thrust blocking to test the pipe at the specified pressures. The Engineer will monitor and approve a satisfactory test.

Furnish the following equipment and materials for the tests:

2 Approved graduated containers
2 Pressure gauges
1 Hydraulic force pump as approved by the Engineer
Suitable hose and suction pipe as required.

Conduct the tests after the trench has been partially backfilled with the joints left exposed for inspection or when completely backfilled, as permitted by the Engineer. Where any section of pipe is provided with concrete thrust blocking, do not make the pressure test until at least 5 days have elapsed after the thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be reduced to 2 days.

Conduct the pressure test in the following manner: After the pipe has been partially backfilled as hereinbefore specified, fill the pipe with water. The test pressure shall be the design working pressure of the pipe.

DURATION. The duration of each pressure test shall be 30 minutes.

EXPELLING AIR. Before applying the specified test pressure, expel all air from the pipe.

PROCEDURE. Slowly fill the section of pipe to be tested with water and allow to stand for 48 hours under slight pressure to allow the cement-mortar lining to absorb water. Then slowly apply the specified test pressure, calculated for the point of lowest elevation, by means of a pump connected to the pipe.

Then valve off the pump and hold the pressure in the line for the test period. At the end of the test period, operate the pump until the test pressure is again attained. The pump suction shall be in a barrel or similar device, or metered so that the amount of water required to restore the test pressure may be measured accurately.

LEAKAGE. Leakage shall be defined as the quantity of makeup water required to hold the specified test pressure for the duration of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the formula following:

$$L = \frac{NDP^{\frac{1}{2}}}{5,500}$$

in which

L = allowable leakage in gallons per hour
N = number of joints in the length of pipe tested
D = nominal diameter of pipe in inches
P = average test pressure during the leakage test, in pounds per square inch.

CORRECTION OF LEAKAGE. Should any test of pipe laid disclose leakage greater than that allowed by use of the above formula, locate and repair the defective joints or pipe until the leakage from subsequent testing is within the specified allowance and there is no visible leakage.

FLUSHING. Before sterilizing, flush all foreign matter from the pipeline. Provide hoses, temporary pipes, ditches, etc. as required to dispose of flushing water without damage to adjacent properties. Flushing velocities shall be at least 2.5 fps. For large diameter pipe where it is impractical or impossible to flush the pipe at 2.5 fps velocity, clean the pipeline in place from the inside by brushing and sweeping, then flush the line at a lower velocity.

STERILIZATION. Pipelines shall be sterilized before placing in service. Sterilizing procedures shall conform to AWWA C601 as hereinafter modified or expanded.

STERILIZING MIXTURE. Shall be a chlorine-water solution having a free chlorine residual of 50 ppm. The sterilizing mixture shall be prepared by injecting: 1) a liquid chlorine gas-water mixture; 2) dry chlorine gas; or 3) a calcium or sodium hypochlorite and water mixture into the pipeline at a measured rate while fresh water is allowed to flow through the pipeline at a measured rate so that the combined mixture of fresh water and chlorine solution or gas is of the specified strength.

The liquid chlorine gas-water mixture shall be applied by means of an approved solution feed chlorinating device. Dry chlorine gas shall be fed through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe being treated. Chlorinating devices for feeding solutions of the chlorine gas or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder.

If the calcium hypochlorite procedure is used, first mix the dry powder with water to make a thick paste, then thin to approximately a one percent solution (10,000 ppm chlorine). If the sodium hypochlorite procedure is used, dilute the liquid with water to obtain a one percent solution. The following proportions of hypochlorite to water will be required:

Product	Quantity	Water
Calcium Hypochlorite (1) (65 - 70% Cl)	1 lb.	7.5 gal.
Sodium Hypochlorite (2) (5.25% Cl)	1 gal.	4.25 gal.

(1) Comparable to commercial products known as HTH, Perchloron, and Pittchlor.
(2) Known as liquid laundry bleach, Chlorox, Purex, etc.

All pipe and fittings used for making connections to existing pipelines shall be sprayed with a solution containing sufficient chlorine to provide a free chlorine residual of 200 ppm, prior to installation.

POINT OF APPLICATION. Inject the chlorine mixture into the pipeline to be treated at the beginning of the line through a corporation stop or suitable tap in the top of the pipeline. Water from the existing system or other approved source shall be controlled so as to flow slowly into the newly laid pipeline during the application of chlorine. The rate of chlorine mixture flow shall be in such proportion to the rate of water entering the pipe that the combined mixture shall contain 50 ppm of free available chlorine. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Use check valves if necessary.

RETENTION PERIOD. Treated water shall be retained in the pipeline long enough to destroy all nonspore-forming bacteria. With proper flushing and the specified solution strength, 24 hours is adequate. At the end of the 24-hour period, the sterilizing mixture shall have a strength of at least 10 ppm of chlorine.

Operate all valves, hydrants, and other appurtenances during sterilization to assure that the sterilizing mixture is dispersed into all parts of the line, including dead ends, new services, and similar areas that otherwise may not receive the treated water.

Do not place concentrated quantities of commercial sterilizers in the line before it is filled with water.

After chlorination, flush the water from the line until the water through the line is equal chemically and bacteriologically to the permanent source of supply.

DISPOSAL OF STERILIZING WATER. Dispose of sterilizing water in an approved manner. Do not allow sterilizing water to flow into a waterway without adequate dilution or other satisfactory method of reducing chlorine concentrations to a safe level.

D. PAYMENT. Payment for furnishing and installing the concrete cylinder pipe and fittings will be made at the unit price per linear foot stated in the Contractor's Proposal. This payment shall constitute full compensation for all work specified under this section.

The measure for payment will be the field measured center line length of the pipe and fittings in place.

No payment for pipe in place will be made until the pipe has successfully passed the leakage test.

The Engineer will withhold full payment on any section of pipe deemed unsatisfactory due to excessive leakage or any other causes until such defects have been corrected in accordance with these Contract Documents and are acceptable to the Engineer.

MECHANICAL COUPLINGS AND FLANGED COUPLING ADAPTERS. Measurement and payment for mechanical couplings and flanged coupling adapters will be made at unit prices stated in the Contractor's Proposal under the section CAST IRON PIPE AND FITTINGS.

IMPORTED GRANULAR PIPE BASE AND PIPE ZONE MATERIAL. Measurement and payment for imported granular material for pipe base and pipe zone will be made at the unit prices stated in the Contractor's Proposal under Section CAST IRON PIPE AND FITTINGS.

Imported granular material will be paid for only when authorized by the Engineer.

15C. VALVES AND VALVE BOXES

A. SCOPE. This section covers the work necessary for furnishing and installing the butterfly valves, gate valves, and valve boxes, complete.

B. MATERIALS.

BUTTERFLY VALVES. Butterfly valves shall be the rubber-seated type, suitable for direct-burial service and suitable for 150 psi working pressure and 150 psi pressure differential across the valve. Valve ends shall be as shown. Furnish all joint accessories with valve. Mechanical joint ends shall conform to AWWA C111. Valves shall be equipped with iron body and either 304 stainless steel circular shaft or high-tensile steel hexagon shaft with 304 stainless steel journals. Shaft and disc seals shall be designed for a bottle-tight seal. Valve disc shall be either cast iron alloy conforming to ASTM A 436, Type 1, or chrome-edged cast iron with Buna-N rubber seat bonded to the valve body; or shall be cast iron with rubber disc seat and 304 stainless steel body seat integrally cast into the valve body. Valve operator shall be as specified below. Except as herein noted, the butterfly valve shall conform to AWWA C504-66 for Class 150B. Valve shall be Dresser No. 450, or as approved.

BUTTERFLY VALVE OPERATORS. All butterfly valves shall be furnished with totally enclosed, integral valve operators designed to withstand a minimum of 300 foot-pound input torque without damage to the valve or operator. Operators shall be fully gasketed and grease-packed and designed to withstand submersion in water to a pressure of 10 psi. Valves shall open with a counterclockwise rotation of an AWWA nut. A minimum of 30 turns of the operating nut shall be required to move the disc from a fully-open position to a fully-closed position. Valve operators shall conform to AWWA C504-66.

GATE VALVES, 4-INCH. Gate valves shall be iron body, bronze mounted, double disc, parallel seat, NRS valves with O-ring seals, and shall open when the stem is rotated counterclockwise. Valves shall have 2-inch square wrench nut. Valve ends and valve sizes shall be as shown. Valves shall conform to AWWA C500. Mechanical joint by flange valves shall be Mueller A-2380-18; flanged valves shall be Mueller A-2380-6, with 2-inch square wrench nut; and mechanical joint valves shall be Mueller A-2380-22; or as approved.

CORPORATION STOP. The corporation stop shall have iron pipe outlet threads and shall be Mueller H-10045, H-10046, or as approved.

JOINTING MATERIALS. Jointing materials for mechanical joint for cast iron pipe shall conform to AWWA C111. Jointing materials for flanged joints shall consist of 1/8-inch thick, cloth-inserted sheet rubber gaskets extending from the inside diameter of the flange to at least the inside edge of the bolt and shall conform to Section 7 of AWWA C207. Bolts and nuts shall conform to Section 8 of AWWA C207.

VALVE BOXES. Valve boxes shall be Buffalo 2-piece sliding type, cast iron with 5-1/4-inch shaft, and shall be Mueller H-10364 of appropriate length for the installation, or as approved. The word WATER shall be cast into the top of the lid. Extension pieces, if required, shall be the manufacturer's standard type for use with the valve box.

C. WORKMANSHIP.

VALVES. Before installation, the valves shall be thoroughly cleaned of all foreign material, and shall be inspected for proper operation, both opening and closing, and to verify that the valves seat properly. Valves shall be installed so that the stems are vertical, unless otherwise directed by the Engineer. Jointing shall conform to AWWA C600 or AWWA C603, whichever is applicable. Valves shall be installed in accordance with Standard Detail No's. 103 and 113.

VALVE BOXES. Center the valve boxes and set plumb over the wrench nuts of the valves. Set valve boxes so that they do not transmit shock or stress to the valves. Set the valve box covers flush with the surface of the finished grade as shown, or such other level as may be ordered by the Engineer. Cut extensions to the proper length so that the valve box does not ride on the extension when set at grade. Valve boxes shall be installed in conformance with Standard Detail No's. 103 and 113.

Place backfill around the valve boxes and thoroughly compact to a density equal to that of the undisturbed ground and in such a manner that will not damage or displace the valve box from proper alignment or grade. Misaligned valve boxes shall be excavated, plumbed, and backfilled at the Contractor's expense.

CORPORATION STOPS. Install corporation stops on concrete cylinder pipe in locations field verified by the Contractor and taps installed during the time of fabrication of the pipe.

D. PAYMENT. Payment will be made for each valve and valve box furnished and installed at the unit prices stated in the Contractor's Proposal. Payment for the valves and valve boxes shall constitute full compensation for all work specified under this section.

Payment for corporation stops will be made at the unit price stated in the Contractor's Proposal. Payment for corporation stops shall constitute full compensation for work specified under this section.

15D. FIRE HYDRANT ASSEMBLIES

A. SCOPE. This section covers the work necessary for furnishing and installing the fire hydrant assemblies, complete.

B. MATERIALS.

HYDRANTS. Nominal 5-1/4-inch main valve opening with 6-inch bottom connection. Equip with two 2-1/2-inch hose nozzles and one 4-1/2-inch pumper nozzle. Operating nut shall be 1-1/2-inch National Standard pentagon nut. The main valve shall be equipped with O-ring seals and shall open when turned to the left or counterclockwise. Hydrants shall be of the break-flange or safety-top type. Hydrants shall conform to AWWA C502, and this Specification. The depth of bury shall generally be 4 feet, but the Contractor shall verify at each location in the field with the Engineer. Nozzle threads shall be American National Standard. The inlet connection shall be flanged. Hydrants shall be white above the ground line.

Nozzle caps and top of hydrant shall be black. Hydrants shall be Mueller A-24015 improved AWWA fire hydrant.

BASE BLOCK. Solid precast concrete pier block having nominal dimensions of 12" x 8" x 16".

GRAVEL FOR DRAINAGE. 3/4-inch crushed rock or graded river gravel free of organic matter, sand, loam, clay, and other small particles that will tend to restrict water flow through the gravel.

EXISTING HYDRANTS. Existing hydrants to be transferred to new pipelines are indicated on the Plans.

C. WORKMANSHIP. Construction and installation shall conform to provisions of Sections 11 and 12 of AWWA C600, except where otherwise specified.

LOCATION AND POSITION. Locate as shown or directed so as to provide complete accessibility and minimize possibility of damage from vehicles or injury to pedestrians. The length of connecting spool piece shall be verified in the field by the Contractor with the Engineer. Improperly located hydrants shall be disconnected and relocated at the Contractor's expense.

When placed behind the curb, set hydrant barrel so that no portion of the pumper or hose nozzle cap will be less than 18 inches from the gutter face of the curb.

Set all hydrants plumb and nozzles parallel with, or at right angles to, the curb, with the pumper nozzle facing the curb, except that hydrants having 2 hose nozzles 90 degrees apart, set with each nozzle facing the curb at an angle of 45 degrees. Set hydrants so that safety flange is a minimum of 2 inches above finished ground or sidewalk level to clear bolts and nuts, or as directed.

EXCAVATION. Do not carry below subbase grade. Refill overexcavated areas with gravel, and hand tamp to provide firm foundation.

BASE BLOCK. Place on firm, level subbase to assure uniform support.

HYDRANTS. Place carefully to prevent the base blocking from breaking. When cast iron pipe is used, joining procedures shall conform to Section 9 of AWWA C600, except that cement joints shall not be used.

After hydrant is in place and connected to the pipeline, place temporary blocks to maintain the hydrant in a plumb position during subsequent work.

GRAVEL FOR DRAINAGE. Place around base block and hydrant bottom after hydrant has been blocked in place. Top of gravel shall be not less than 6 inches above hydrant drain opening. Do not connect drainage system to sewer.

TRANSFERRING HYDRANTS. Hydrants to be moved to new locations shall be disconnected and protected from damage until installed in new locations. If the hydrants appear not to be in proper working order, the Owner will be notified so that repairs can be made. The hydrants shall be installed in the same manner as new hydrants.

GUARD POSTS. On Wynooski Street remove one existing guard post as noted on the Plans, and install a new guard post similar to the old guard post as noted on the Plans. Paint new and old guard posts.

D. PAYMENT.

FIRE HYDRANT ASSEMBLY. Payment will be made for each fire hydrant assembly furnished and installed at the unit price stated in the Contractor's Proposal. This payment shall constitute full compensation for all work specified under this item.

TRANSFERRING HYDRANTS. Payment for transferring hydrants will be made at the unit price stated in the Contractor's Proposal. This payment shall constitute full compensation for all work specified under this item.

GUARD POST. Payment for removing the old guard post, installing the new guard post, and painting both guard posts will be made at the unit price stated in the Contractor's Proposal. This payment shall constitute full compensation for all work specified under this item.

15E. AIR AND VACUUM RELEASE VALVE ASSEMBLIES

A. SCOPE. This section covers the work necessary for furnishing and installing the air and vacuum release valve assemblies, complete.

The Type A air valve assembly shall include all work between limits shown on Standard Detail No. 101; including tapping main pipeline, installing service saddle, and any incidental excavation and backfill as may be required to install the vault.

B. MATERIALS.

SERVICE SADDLE. Smith-Blair No. 313 double-strap service clamps with AWWA thread corporation stop, tap, and neoprene gaskets. Service clamps shall be adequate for use with the size, type, and class of the water pipe.

AIR AND VACUUM RELEASE VALVES. The air and vacuum release valves shall be constructed to permit the escape of large volumes of air when the line is being filled with water to permit smaller amounts of accumulated air to be released under normal operating conditions, and so that air may re-enter the line to break any vacuum caused by the water leaving the line rapidly. The valves shall be designed to operate under working pressures of 150 psi and shall have been tested at a pressure not less than 300 psi.

The air and vacuum release valves shall be 1-inch air and vacuum and air release valves similar to APCO Heavy-Duty Combination Air Release Valve, Model No. 143C, as manufactured by the Valve and Primer Corporation, Chicago, Illinois. The inlets shall have iron pipe threads.

MANHOLE. The manhole for the Type A air release valve assemblies shall be one or more 3-foot lengths of tongue-and-groove, reinforced concrete sewer pipe conforming to ASTM C 76, Class II. Concrete sewer pipe shall be 24-inch diameter.

MANHOLE RING AND COVER. The manhole ring and cover shall be cast iron. The 24-inch manhole ring and cover shall be Olympic Pattern No. 5822, with lid Type A, as manufactured by the Olympic Foundry Company, Seattle, Washington, or similar as approved. Cover and ring shall have machined bearing surfaces.

ANGLE VALVE. The angle valve shall be bronze body, plug disc. Valve shall have threaded connections and shall be Crane No. 16-1/2P or as approved. Size shall be the same as the air release valve.

PIPE AND MALLEABLE IRON FITTINGS. The pipe used for the air release valve assemblies shall be Schedule 80 steel pipe conforming to ASTM A 120, as shown. Fittings and companion flanges shall conform to Federal Specification WW-P-521, Type II, galvanized.

CORPORATION STOP. The corporation stop shall be Mueller No. H-10045 with AWWA inlet threads and 1-inch inside iron pipe outlet threads.

BRASS FITTINGS. Brass nipples shall conform to Federal Specification WW-P-460.

GRAVEL. Gravel shall be 3/4-inch minus gravel with reasonably even gradation from coarse to fine and free from excessive dirt or other foreign material.

C. WORKMANSHIP.

TAPPING PIPE. The pipe shall be tapped and service saddle installed by experienced workmen using tools in good repair with proper adapters for size main being tapped. The tapping machine shall be of a type approved by the Engineer. Install the service saddle as recommended by the manufacturer.

PIPING. Cut pipe with sharp tools and ream ends of all cut sections. An approved joint compound shall be applied to the threads of all pipe, fittings, and valves prior to joining. After threaded joints are made up, the exposed threads and pipe shall be given a protective coating of Tarset, a coal-tar epoxy, manufactured by Pittsburgh Coke and Chemical Company; or Bitumastic 300, as manufactured by Koppers Company, Inc. Protective coating shall be applied in conformance with the manufacturer's printed directions and recommendations.

MANHOLE. Compact thoroughly the pipe zone and bedding for the manhole. The concrete pipe for manhole shall then be set in place. The concrete manhole pipe shall be bedded upon gravel in such a manner that it does not rest within 8 inches of the crown of the transmission pipeline. Cut concrete pipe as required so that the finished grade of the manhole conforms to the slope and elevation of the adjacent ground. The concrete pipe shall be placed off center and the air valve oriented for easy access to the valve operator.

The manhole ring and cover shall be set in a bed of mortar consisting of 1 part cement to 3 parts sand. The ring shall have continuous and uniform bearing on the concrete pipe.

CELLULAR POLYSTYRENE. Install as shown.

TESTING. Air valve assemblies shall be tested in conjunction with pipeline.

STERILIZATION. Air valve assemblies shall be sterilized in conjunction with the pipeline sterilization.

D. PAYMENT. Payment for the vacuum and air release valve assemblies will be made at the unit prices stated in the Contractor's Proposal for each respective air release valve assembly installed.

15F. BLOWOFF VALVE ASSEMBLIES

A. SCOPE. This section covers the work necessary for furnishing and installing the blowoff assemblies, complete.

B. MATERIALS.

BUTTERFLY VALVES. Butterfly valves shall be the rubber-seated type, suitable for direct-burial service and suitable for 150 psi working pressure and 150 psi pressure differential across the valve. Valve ends shall be flanged. Furnish all joint accessories with valve. Valves shall be equipped with iron body and either 304 stainless steel circular shaft or high-tensile steel hexagon shaft with 304 stainless steel journals. Shaft and disc seals shall be designed for a bottle-tight seal. Valve disc shall be either cast iron alloy conforming to ASTM A 436, Type 1, or chrome-edged cast iron with Buna-N rubber seat bonded to the valve body; or shall be cast iron with rubber disc seat and 304 stainless steel body seat integrally cast into the valve body. Valve operator shall be as specified below. Except as herein noted, the butterfly valve shall conform to AWWA C504-66 for Class 150B. Valve shall be Dresser No. 450, or as approved.

BUTTERFLY VALVE BURIED OPERATORS. All butterfly valves shall be furnished with totally enclosed, integral valve operators designed to withstand a minimum of 300 foot-pound input torque without damage to the valve or operator. Operators shall be fully gasketed and grease-packed and designed to withstand submersion in water to a pressure of 10 psi. Valves shall open with a counterclockwise rotation of an AWWA nut. A minimum of 30 turns of the operating nut shall be required to move the disc from a fully-open position to a fully-closed position. Valve operators shall conform to AWWA C504-66.

JOINTING MATERIALS. Jointing materials for flanged joints shall consist of 1/8-inch thick, cloth-inserted sheet rubber gaskets, extending from the inside diameter of the flange to at least the inside edge of the bolt and conforming to Section 7 of AWWA C207, and bolts and nuts, which shall conform to Section 8 of AWWA C207.

VALVE BOXES. Valve boxes shall be Buffalo 2-piece sliding type, cast iron with 5-1/4-inch shaft, and shall be Mueller H-10364 of appropriate length for the installation, or as approved. The word WATER shall be cast into the top of the lid. Extension pieces, if required, shall be the manufacturer's standard type for use with the valve box.

BLOWOFF PIPE AND FITTINGS. Blowoff pipe and fittings shall be cast iron pipe. Pipe and fittings shall conform to the applicable portions of Section CAST IRON PIPE AND FITTINGS. Fittings shall be the same class as adjacent pipe.

RIPRAP. Riprap shall be clean, hard quarry stone or rock with a maximum size of 65 pounds, and 75 percent of the rock shall be between 30- and 50-pound pieces with only sufficient smaller material to key the larger material.

TRENCH EXCAVATION AND BACKFILL. Shall be of the same class as adjacent pipeline and shall conform to Section TRENCH EXCAVATION AND BACKFILL.

C. WORKMANSHIP.

GENERAL. Before installation, carefully clean valves of all foreign materials, adjust stuffing boxes, and inspect valves in OPEN and CLOSED positions. Install valves in accordance with the applicable portions of these Specifications. Install valves with the stem vertical. Installation practices shall conform to manufacturer's recommendations.

Prior to joining flanged valves, the flange faces shall be thoroughly cleaned. After cleaning, insert the gasket and bolts and tighten the nuts progressively and uniformly. If flanges leak under pressure, loosen the nuts, reseat or replace the gasket, retighten the nuts, and retest the joint. Joints must be watertight at test pressures before acceptance.

PIPE AND FITTINGS. Blowoff assemblies shall be set as shown with the discharge pointed toward the receiving stream or ditch for Type A assemblies. Install piping in conformance with the applicable portions of Section CAST IRON PIPE AND FITTINGS. Location of outlet shall be as directed by the Engineer.

TRENCH EXCAVATION AND BACKFILL. Shall conform to the applicable portions of these Specifications. Trench excavation and backfill shall be the same class as the adjoining pipe.

D. PAYMENT. Payment for blowoff assemblies will be based on the unit price for each valve and valve box installed. Pipe and fittings will be paid for under Section CAST IRON PIPE AND FITTINGS. Excavation and backfill will be paid for under Section TRENCH EXCAVATION AND BACKFILL.

16A. ELECTRICAL TEST LEAD STATIONS

A. SCOPE. This section covers the work necessary for the installation of electrical test lead stations and electrical wiring connections from the pipelines to the test lead stations.

The locations of the electrical test lead stations shown on the Plans are approximate only. The actual locations will be as directed by the Engineer.

B. MATERIALS.

MARKER POSTS. Marker posts, as shown on the Plans, shall be 4" x 4" S4S Construction Grade cedar posts.

MISCELLANEOUS ELECTRICAL ACCESSORIES. The Contractor shall furnish the miscellaneous electrical accessories shown on the Plans and as required. Where a manufacturer's numbers and brand names of products are not indicated, the material shall be of the best commercial quality, thoroughly suited for the intended use, and shall meet with the approval of the Engineer. Any substitutions made from the materials designated shall be approved by the Engineer before installation.

TEST LEADS. Test leads shall be No. 12 stranded copper wire with TW insulation. The thermite welds required to attach the test leads to the pipe shall be No. 15 PCI, Thermoweld cartridge, manufactured by Continental Industries, Inc., 7401 East 41st Street, Tulsa, Oklahoma, or as approved. Graphite molds and other thermite welding appurtenances, designed by the manufacturer for installing the thermite weld cartridges, shall be used to make the welds. Coal-tar enamel shall be Koppers Bitumastic No. 505.

JUNCTION BOX. The junction box for each installation shall be an Appleton No. FS-1-75L box with No. FSK-1B-C cover and gasket.

C. WORKMANSHIP.

ELECTRICAL TEST LEADS. The installation of the test leads between the pipeline and electrical test lead stations shall be performed by skilled mechanics and in accordance with the information on the Plans. Each cable shall consist of a single length extending from the pipe to the point of connection with the extra slack, as indicated. The point of contact and the thermite weld shall be wire brushed or filed to a bare metal surface. The thermite welding cartridge and molds shall be used in strict accordance with the manufacturer's recommendations. After the thermite welds have been made and have cooled, slag shall be brushed from the bonded area and the joint thoroughly cleaned. The Contractor shall perform all excavation and backfill as necessary for the installation, shall dispose of any excess excavation, and shall leave the area of work clean, neat, and satisfactory to the Engineer. The connecting cable shall be buried at a minimum depth of 18 inches. Backfill material over test lead wires shall be carefully backfilled with hand shovels.

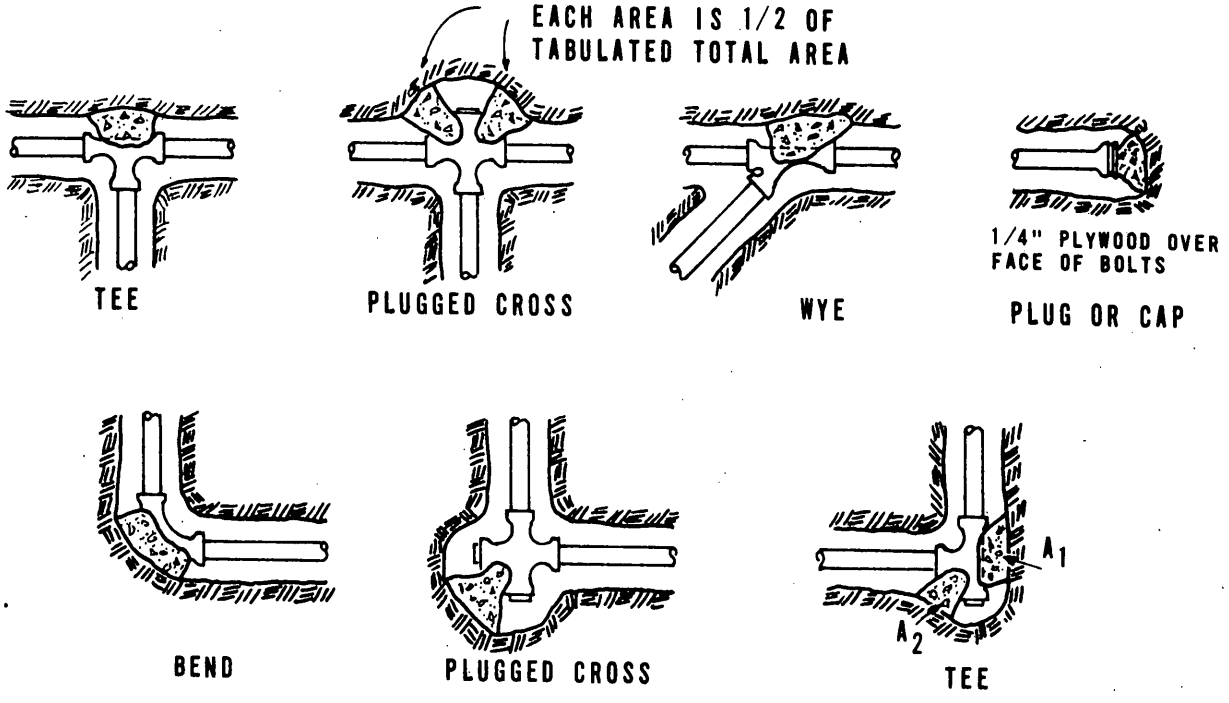
MARKER POSTS. Marker posts shall be installed true and plumb at locations shown on the Plans. Posts shall be set adjacent to the leads in the locations directed by the Engineer.

The marker post shall receive 2 coats of white exterior enamel paint. The identification letter shall be of black enamel paint and shall face in the usual direction of approach.

WELDING HALF COUPLINGS TO PIPE. Half couplings shall be shop welded or brazed to the pipe. Damaged lining and coating shall be replaced in the shop. After the thermite weld connection has been made, fill the coupling with hot coal-tar enamel, and wrap (half-hitch) the test lead wire around the coupling.

D. PAYMENT. Payment for electrical test lead stations will be made at the unit price stated in the Contractor's Proposal for each test lead station installed. This payment shall constitute full compensation for all work specified under this section.

****



NOTES:

1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS; e.g. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.
4. IF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED BELOW, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

BEARING AREA OF THRUST BLOCKS IN SQ. FT.

FITTING SIZE	TEE, WYE, PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN A_1	TEE PLUGGED ON RUN A_2	45° BEND	22½° BEND	11¼° BEND
4	1.0	1.4	1.9	1.4	1.0	—	—
6	2.1	3.0	4.3	3.0	1.6	1.0	—
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

NOTE:

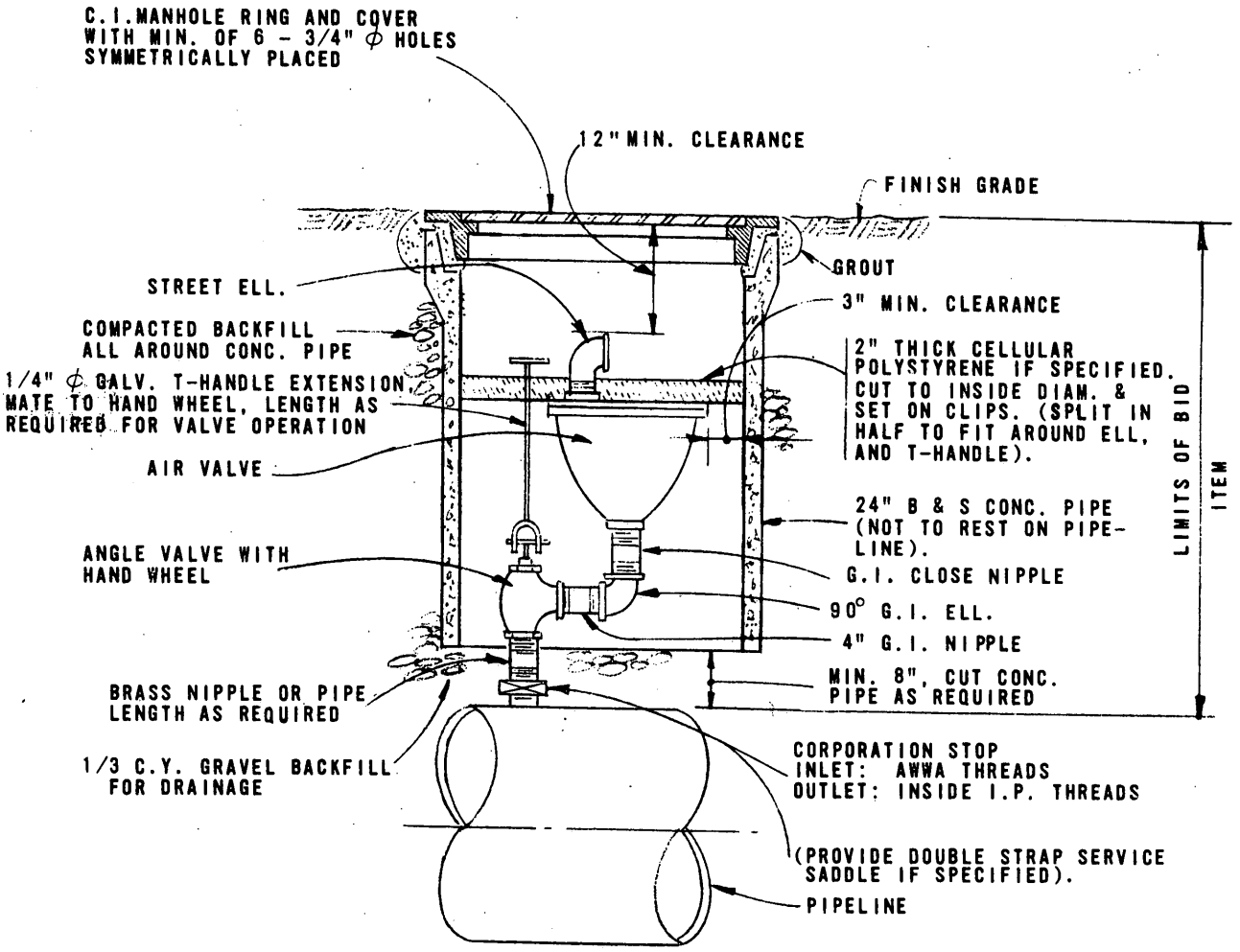
ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 p.s.i. AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BEARING AREA = (TEST PRESSURE/150)X(2000/SOIL BEARING STRESS)X(TABLE VALUE).

STANDARD DETAIL NO. 100

THRUST BLOCKING DETAILS

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M

A-0-269 REV. SEPT. 1968



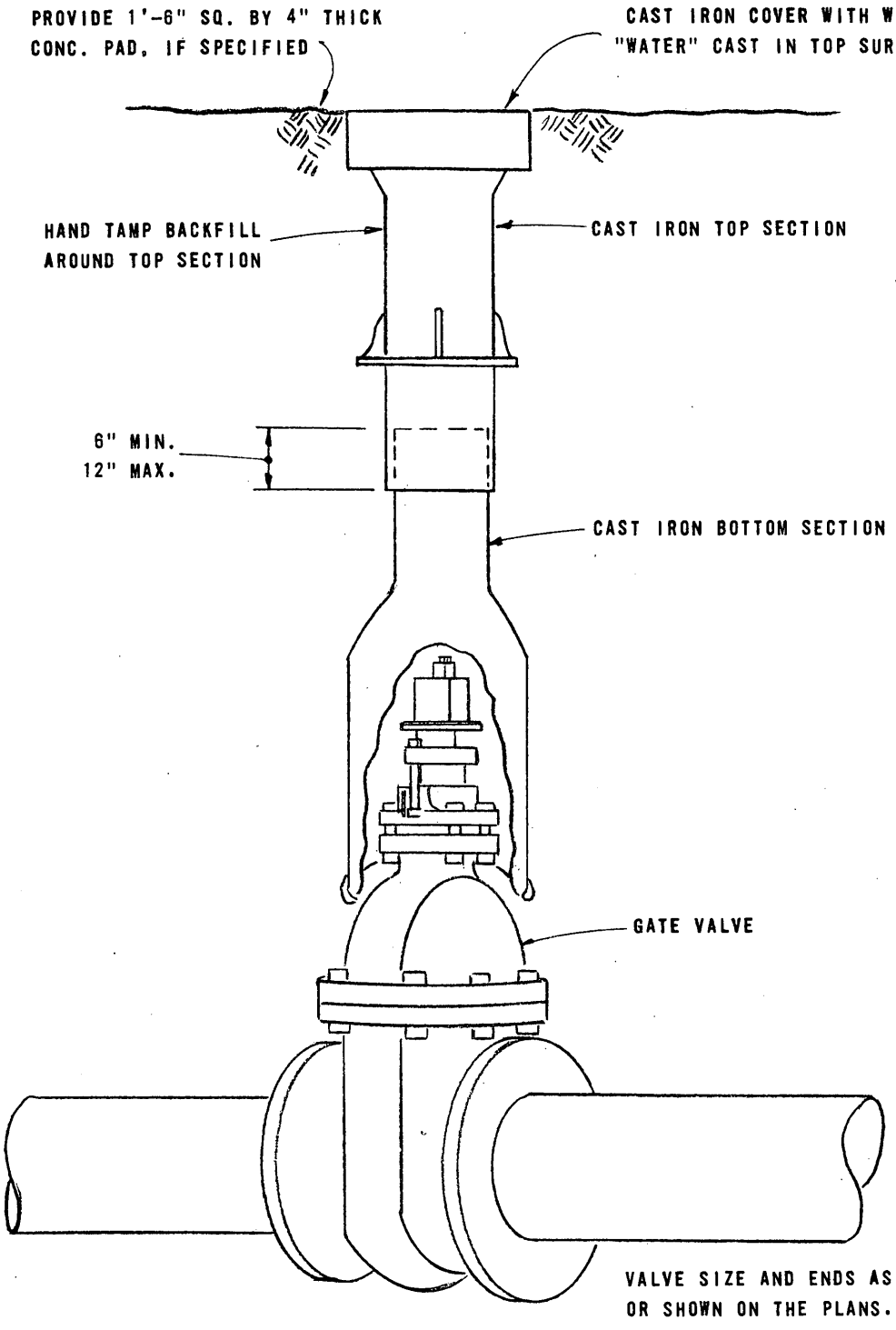
NOTES:

1. CORPORATION STOP, ANGLE VALVE AND CONNECTING PIPING SHALL BE THE SAME DIAMETER AS THE AIR VALVE INLET.
2. USE APPROVED JOINTING COMPOUND ON ALL THREADED CONNECTIONS.
3. ROTATE AIR VALVE TO PROVIDE MAXIMUM CLEARANCE FOR ACCESS TO ANGLE VALVE.
4. AIR VALVE DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER THIS STANDARD DETAIL.

STANDARD DETAIL NO. 101
AIR VALVE ASSEMBLY
DETAIL -- TYPE A
(FOR AIR VALVES UP TO AND INCLUDING 2")

REVISED OCTOBER 1968

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M



TYPICAL VALVE SETTING

STANDARD DETAIL NO. 103

GATE VALVE AND VALVE BOX SETTING DETAILS

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M

LINE SYMBOLS FOR UTILITY LINE CONSTRUCTION (NOTE: All of the symbols shown below are not necessarily used on the accompanying plans)

GENERAL SYMBOLS

- Proposed Utility (this project)
- 5 — Stationing Along Proposed Utility
- Existing Improvements or Utilities
- —P/L— P/L: Property Lines; R/W: Rights-of-way Lines; E/L: Easement Line
- -x—x—x- Existing Fence
- -O—W 6"— Existing Water Line and Valve
- -O—S 12"— Existing Sanitary Sewer and Manhole
- -□- SS 18"— Existing Storm Sewer and Catch Basin
- —G—4"— Existing Gas Line
- —T— 26 PR Existing Underground Telephone
- -E— 220V Existing Underground Electric
- —IR— Existing Irrigation Pipeline
- Ditch
- 12" Existing Culvert Showing Showing Flow Direction
- Centerline (also noted ℄)
- Boundary Lines (city limits, parks, cemeteries, etc.)
- Section Lines, DLC Lines, etc.
- MH Proposed Manhole in new line
- Proposed Valve in new line
- Proposed Fire Hydrant on new line
- Existing Fire Hydrant
- 1" ARV / 2" CARV — Air Release Valve, Size / Combination Air Release Valve, Size
- 6"BO — Blowoff, size
- Power or Telephone Pole, Guy Anchor (line indicates the location of the face of the pole nearest the proposed utility line location)
- 32+10 — Survey Hub and Stationing
- Land Monument (iron rod, iron pipe, brass cap set in concrete, etc.)
- Pavement Replacement
- T — Topsoil Replacement
- D — Backfill Classification
- 48"@0.0012 — Size and Slope of Pipe 48" pipe = 0.0012 FT/FT
- PT — Angle Point
- TH #3 — Test Hole Location on Plan
- BM #3 — Bench Mark Location on Plan
- 6 — Test Hole Number; Bottom of Test Hole — Test Hole Location On Profile

LETTER SYMBOLS

PIPING

A.C.	Asbestos Cement
ALT.V.	Altitude Valve
ARV.	Air Release Valve
BI.	Black Iron or Steel
BO.	Blowoff
BS.	Bell and Spigot
BV.	Butterfly Valve
CARV.	Combination Air Release Valve
CC	Concrete Cylinder
CI	Cast Iron
CISP	Cast Iron Soil Pipe
CMP	Corrugated Metal Pipe
CO	Clean Out
CONC.	Concrete
CORP.	Corporation Stop
CU.	Copper
CULV.	Culvert
DI	Ductile Iron
F	Flange
FCA	Flange Coupling Adapter
FH	Fire Hydrant
GI	Galv. Steel or Galv. Iron
GV	Gate Valve
H	Hub Joint
IPT	Iron Pipe Threads
MC	Mechanical Coupling
MH	Manhole
MJ	Mechanical Joint
P	Plastic (of type designated)
PE	Plain End
PO	Push-On Joint
PRV	Pressure Reducing Valve
P.RF.V.	Pressure Relief Valve
RED	Reducer
RG	Retainer Gland
SCR	Screwed Joint
SOL	Solvent Weld Joint

LETTER SYMBOLS (cont.)

PIPING (cont.)

TC	Transition Coupling
TT	Thrust Tie
VC	Vitrified Clay
WI	Wrought Iron
WOOD	Wood Stave
WS	Welded Steel

SURFACING

A.C.	Asphaltic Concrete
CONC.	Portland Cement Concrete
O.M.	Oil Mat
GR	Gravel
PVMT.	Pavement
SWDK.	Sidewalk

MISCELLANEOUS

A.B.	Anchor Bolt
AH	Ahead
BK	Back
BM	Bench Mark
EL	Elevation
EP	Edge of Pavement
EQ	Equation
EX	Existing
FL	Flow Line
Gd.	Ground
HOR.	Horizontal
INV.	Invert
LT.	Left
NA	Not applicable
NTS	Not to Scale
OC	On Centers
P.I.	Point of Intersection
P.O.T.	Point of Tangent
RT.	Right
TB	Thrust Block
TBM	Temporary Bench Mark
VERT.	Vertical
W/	With
W/O	Without
X-ING	Crossing: Railroad, Highway, etc.

GENERAL SYMBOLS (cont.)

CLASS OF SEWER PIPE

- No Symbol ASTM C-14 Standard Strength
- X — ASTM C-14 Extra Strength
- IV — ASTM C-76 Class II, III, IV, or V, as indicated
- 10" AC 150 (Size Type Class) — Pressure Pipe Description

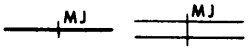
STANDARD DETAIL NO. 109

LINE SYMBOLS FOR UTILITY LINE CONSTRUCTION

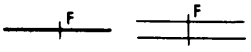
CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M

PIPING DETAIL SYMBOLS FOR UTILITY LINE CONSTRUCTION (NOTE: All of the symbols shown below are not necessarily used on the accompanying plans)

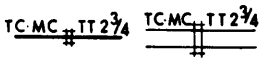
JOINTS



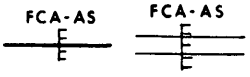
Mechanical Joint



Flanged

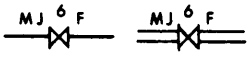


Mechanical coupling or transition coupling — the TT 2-3/4 notes that two — 3/4 inch thrust ties req'd across coupling.

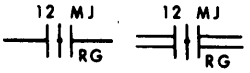


Flange coupling adapter "as" notes anchor studs required.

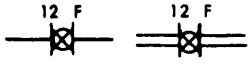
VALVES



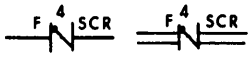
6" Mechanical joint X flange gate valve



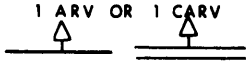
12" Mechanical joint butterfly valve with retainer gland — one end



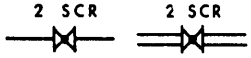
12" Flanged ball valve



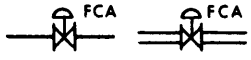
4" Flange X screwed check valve



1" Air release valve or combination air release valve

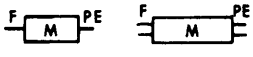


2" Screwed globe valve



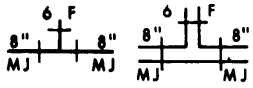
Special purpose valve (type as noted) with flange coupling adapter

MISCELLANEOUS

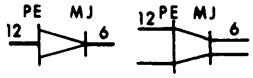


Meter (type as noted) — flange X plain end.

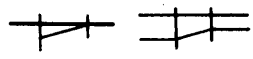
FITTINGS

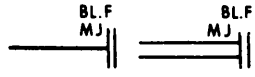


8X8X6 Mechanical joint X Mechanical joint X Flanged tee

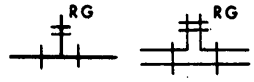


Concentric reducer 12" plain end X 6" mechanical joint

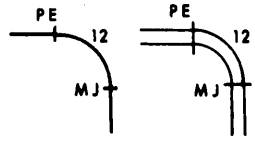

Eccentric reducer



Blind flange or mechanical joint plug, etc.



Retainer gland on mechanical joint fitting

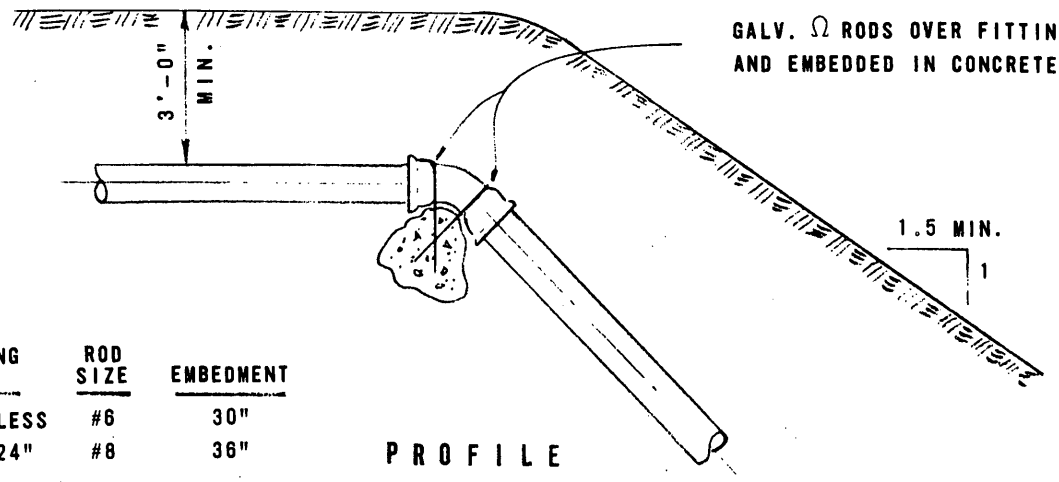


12" Mechanical joint X plain end 90° bend

STANDARD DETAIL NO. 110

PIPING DETAIL SYMBOLS FOR UTILITY LINE CONSTRUCTION

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M



FITTING SIZE	ROD SIZE	EMBEDMENT
12" & LESS	#6	30"
14" – 24"	#8	36"

PROFILE

N.T.S.

1. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES.
2. THE REQUIRED THRUST BLOCK VOLUMES FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLAN; e.g. (6) INDICATES 6 CUBIC YARDS OF CONCRETE ARE REQUIRED.
3. IF NOT SHOWN ON PLANS, REQUIRED VOLUMES AT FITTINGS SHALL BE AS INDICATED BELOW, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) STATED IN THE SPECIAL SPECIFICATIONS.
4. VOLUMES AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER VOLUMES AND THE BLOCKING DETAIL SHOWN ON THIS STANDARD DETAIL.
5. THRUST BLOCKS FOR VERTICAL UP-BENDS SHALL BE THE SAME AS FOR HORIZONTAL BENDS.

FITTING SIZE	VOLUME OF THRUST BLOCK IN CU. YD.			
	90° BEND	45° BEND	22½° BEND	11¼° BEND
4	--	--	--	--
6	1.3	--	--	--
8	2.3	1.1	--	--
10	3.7	1.8	--	--
12	5.5	2.8	1.2	--
14	7.6	3.9	1.7	--
16	9.9	5.1	2.3	0.9
18		6.3	3.2	1.4
20		7.7	4.0	1.8
24		11.1	5.7	2.6

NOTE:

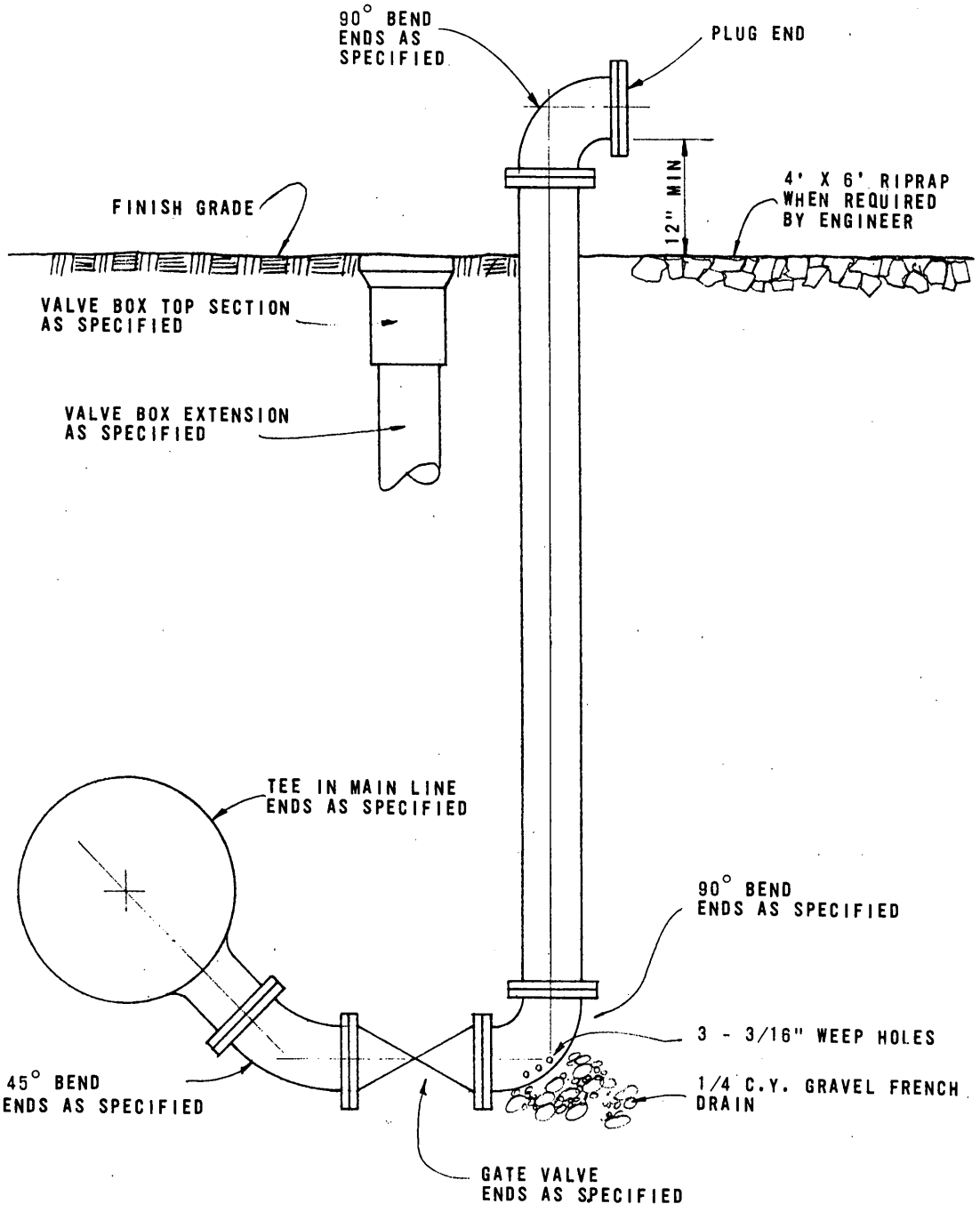
ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 psi. AND THE WEIGHT OF CONCRETE = 4050 LBS/CU. YD. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION: VOLUME = (TEST PRESSURE /150) X (TABLE VALUE).

STANDARD DETAIL NO. 111

THRUST BLOCK DETAILS FOR VERTICAL DOWN-BENDS

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M

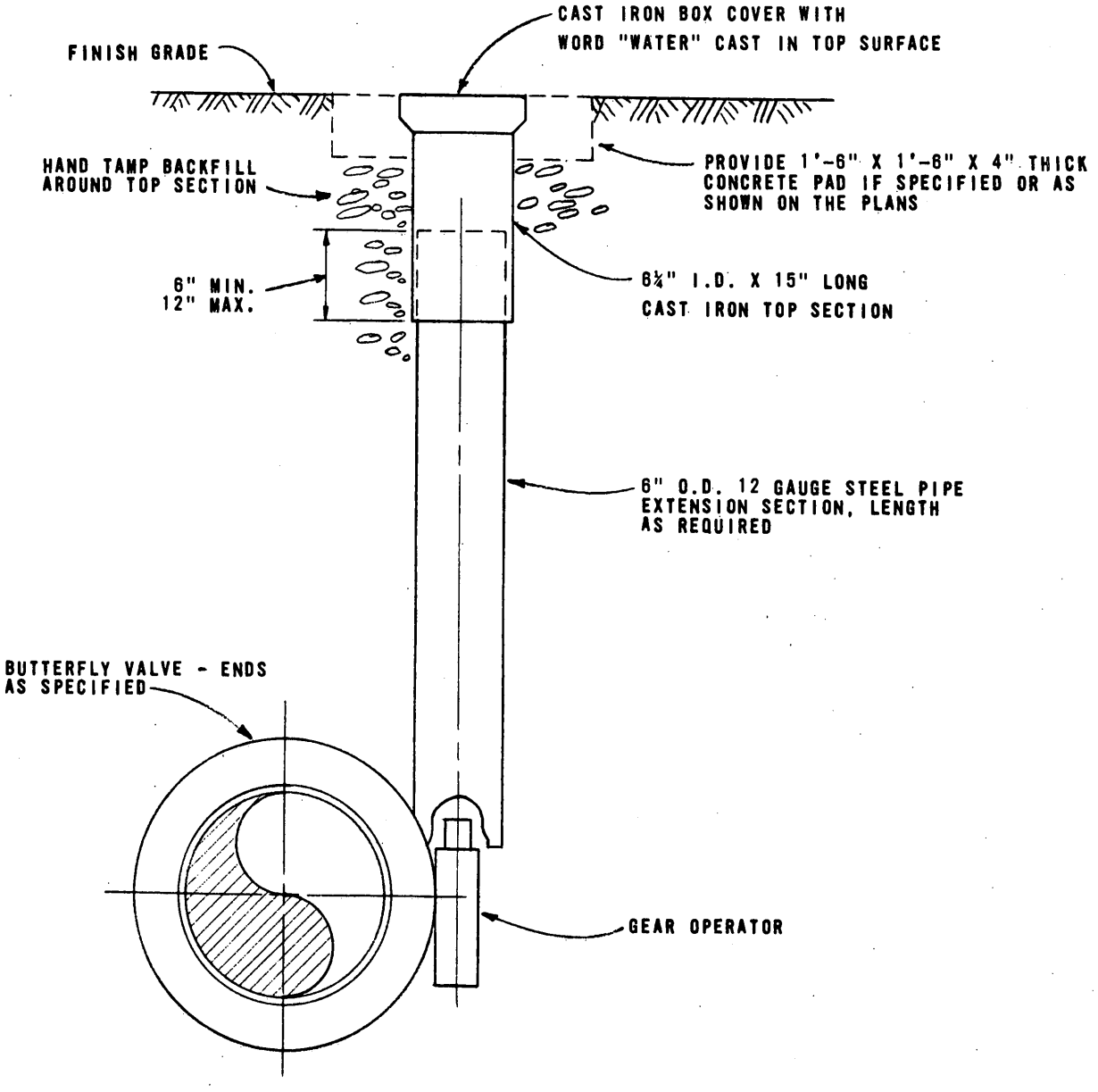
A-0-269 - REVISED MAY 1968



STANDARD DETAIL NO. 112

BLOW-OFF ASSEMBLY TYPE A

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M

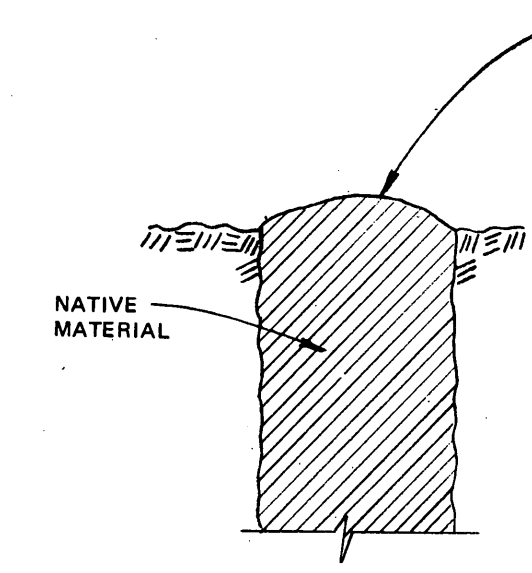


STANDARD DETAIL NO. 113

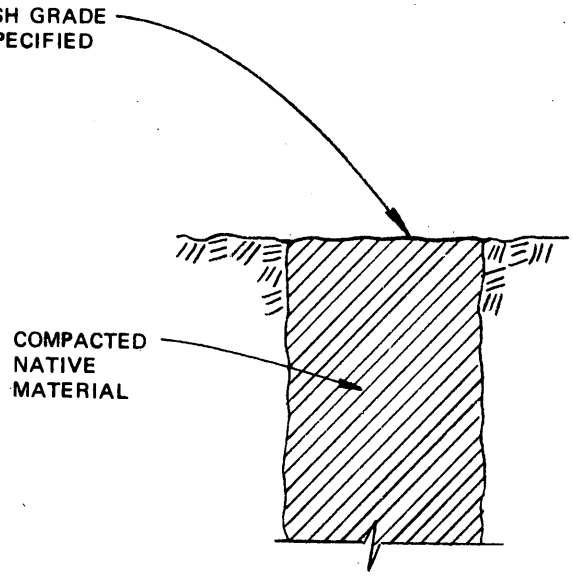
BURIED BUTTERFLY VALVE
AND
VALVE BOX SETTING DETAILS

A-0-269

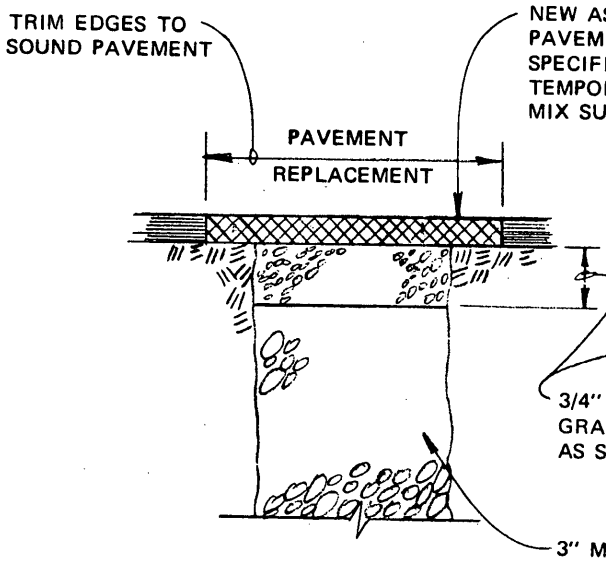
CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND
CH2M



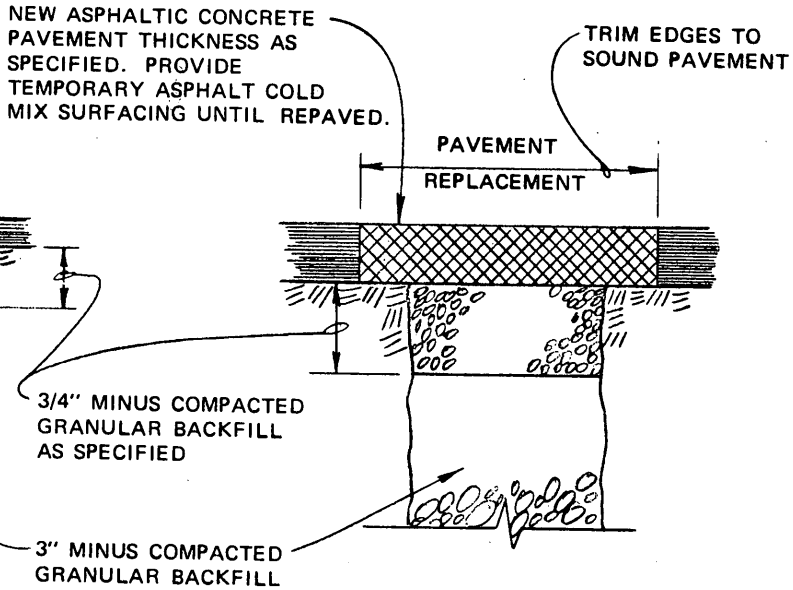
CLASS "C"



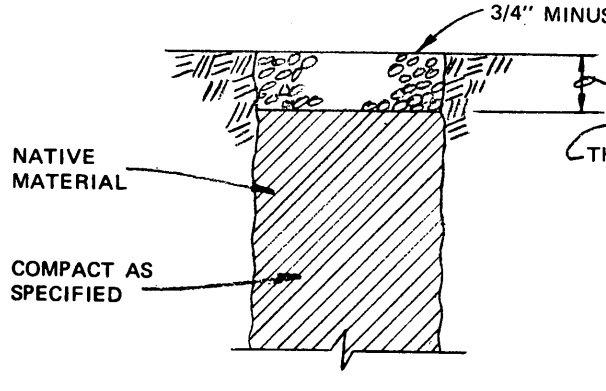
CLASS "H"



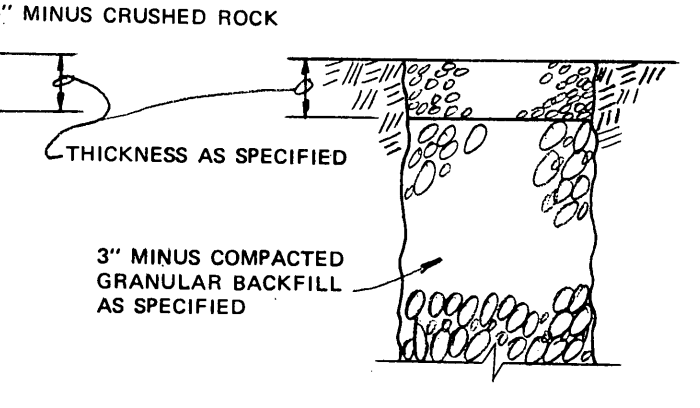
CLASS "D"



CLASS "F"



CLASS "E"



CLASS "J"

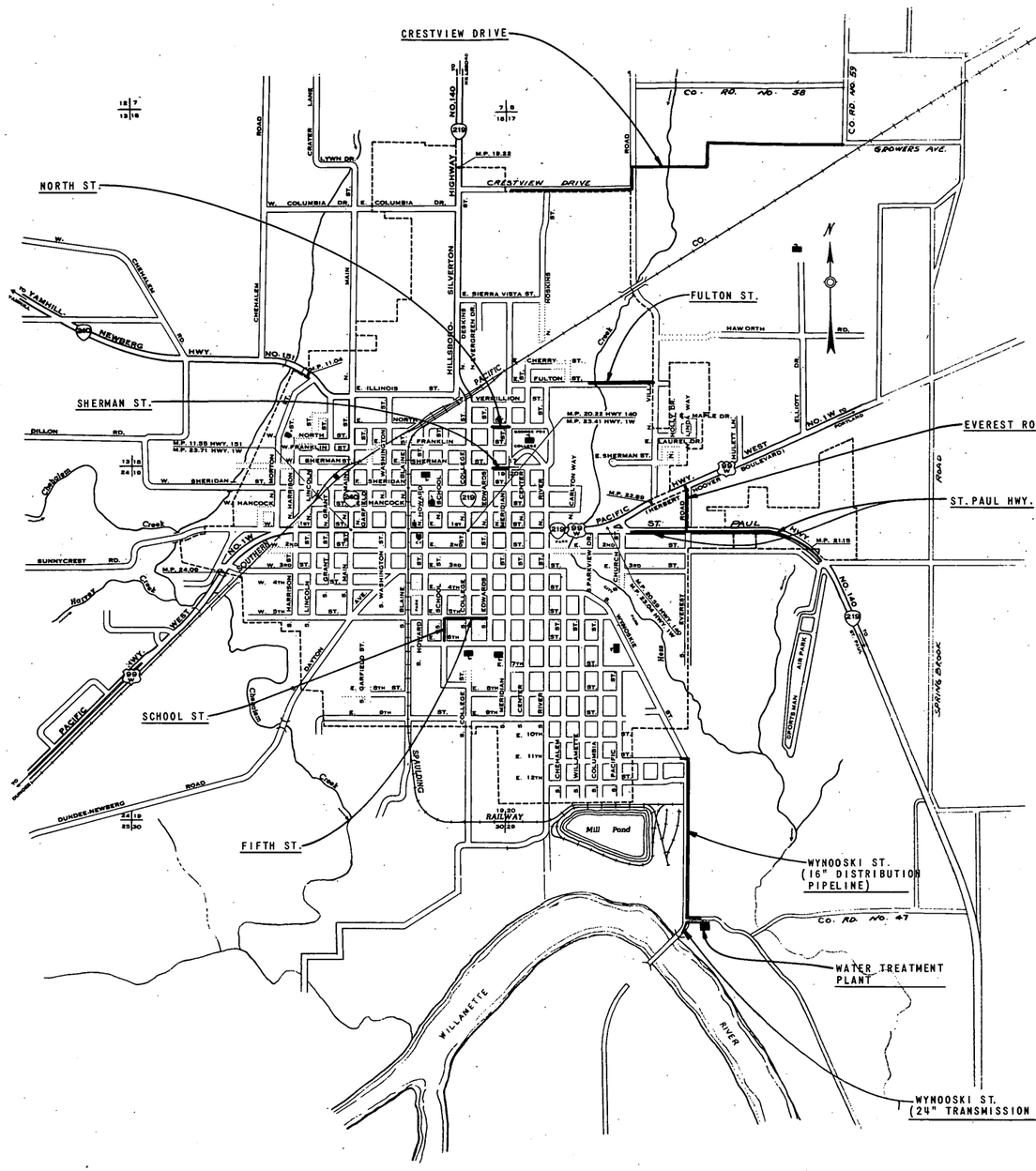
STANDARD DETAIL NO. 204

TRENCH BACKFILL
ABOVE THE PIPE ZONE

CORNELL, HOWLAND, HAYES & MERRYFIELD
Engineers and Planners
SEATTLE CORVALLIS BOISE PORTLAND

CH2M

A-0-269 C5510.1



VICINITY MAP
N.T.S

SECTION OR DETAIL DESIGNATION
SHEET WHERE SECTION OR DETAIL IS SHOWN
SHEET WHERE SECTION OR DETAIL IS TAKEN

SECTION DESIGNATION

INDEX TO DRAWINGS

SHEET NO.	TITLE
1	VICINITY MAP & INDEX TO DRAWINGS
2	CRESTVIEW DRIVE STATION 10+00 TO STATION 24+00
3	CRESTVIEW DRIVE STATION 24+00 TO STATION 38+00
4	CRESTVIEW DRIVE STATION 38+00 TO STATION 50+00
5	CRESTVIEW DRIVE STATION 50+00 TO STATION 60+57
6	ST. PAUL HIGHWAY STATION 11+59 TO STATION 21+00
7	ST. PAUL HIGHWAY STATION 21+00 TO STATION 34+00
8	ST. PAUL HIGHWAY STATION 34+00 TO STATION 40+06
9	EVEREST ROAD STATION 9+72 TO STATION 16+66
10	FULTON STREET STATION 10+00 TO STATION 21+29
11	WYNOOSKI STREET STATION 10+00 TO STATION 23+00
12	WYNOOSKI STREET STATION 23+00 TO STATION 34+31 - 16"
	WYNOOSKI STREET STATION 32+48 TO STATION 35+06 - 24"
13	SCHOOL STREET & FIFTH STREET STATION 0+49 TO STATION 10+17
14	SHERMAN STREET STATION 0+00 TO STATION 2+40
	NORTH STREET STATION 0+00 TO STATION 2+40
15	PIPING DETAILS
16	PIPING DETAILS-CONCRETE CYLINDER PIPING DETAILS
17	PIPING DETAILS

STANDARD DETAILS

(CONSIDERED A PART OF DRAWING NO. C5510-1, SHEET 1 OF 17)

DETAIL NO.	TITLE
100	THRUST BLOCKING DETAILS
101	AIR VALVE ASSEMBLY DETAIL, TYPE A
103	GATE VALVE AND VALVE BOX SETTING DETAILS
109	LINE SYMBOLS FOR UTILITY LINE CONSTRUCTION
110	PIPING DETAIL SYMBOLS FOR UTILITY LINE CONSTRUCTION
111	THRUST BLOCK DETAILS FOR VERTICAL DOWN BENDS
112	BLOW OFF ASSEMBLY TYPE A
113	BURIED BUTTERFLY VALVE AND VALVE BOX SETTING DETAILS
204	TRENCH BACKFILL ABOVE THE PIPE ZONE

NOTES:
1) CONTRACTOR SHALL VERIFY IN FIELD ALL EXISTING PIPELINE ELEVATIONS AND TYPES OF PIPELINE. CONNECTION BEFORE CUTTING EXISTING PIPELINES.
2) LINE SYMBOLS ARE SHOWN ON STANDARD DETAILS 109 & 110.
3) THE COVER OVER PIPELINES SHALL BE 3½ FEET UNLESS CHANGED BY THE ENGINEER OR SHOWN OTHERWISE ON THE PROFILE.
4) STATIONING AND ELEVATIONS ARE GENERALLY ALONG THE "P" LINE - OFFSET DISTANCES TO PIPELINE ARE GENERALLY TO RIGHT OR LEFT OF "P" LINE.

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"= 1'-0" USE ½"= 1'-0" OR 1"= 10' USE 1"= 20'

Archie E. Meeds

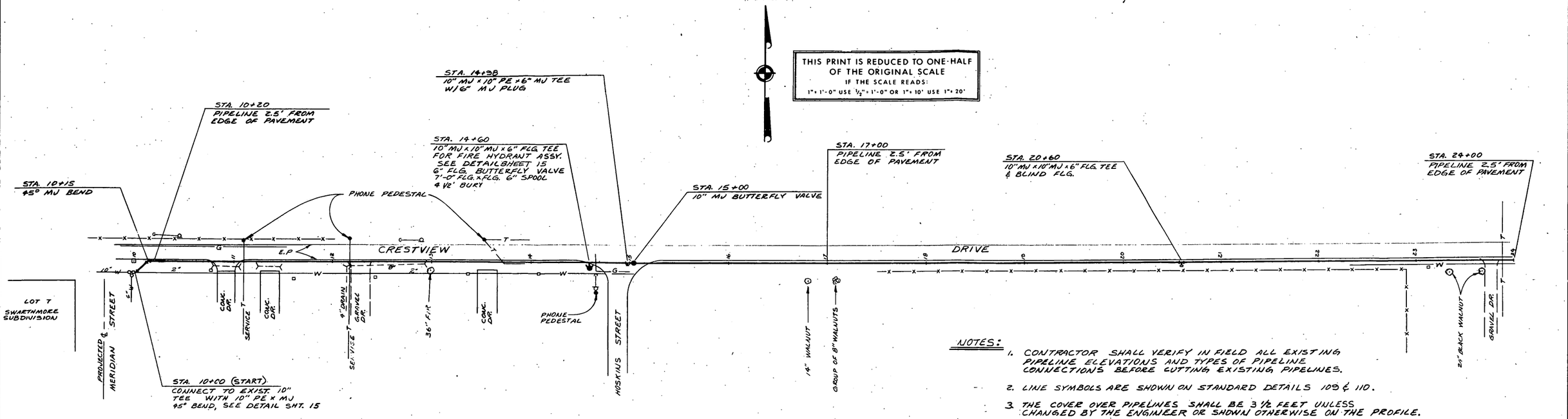
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

VICINITY MAP & INDEX TO DRAWINGS

DES	SHEET 1 OF 17
DR	
CK	DATE JUNE 1970
RN C5510.1	SCALE AS SHOWN
DWG C 5510-1	

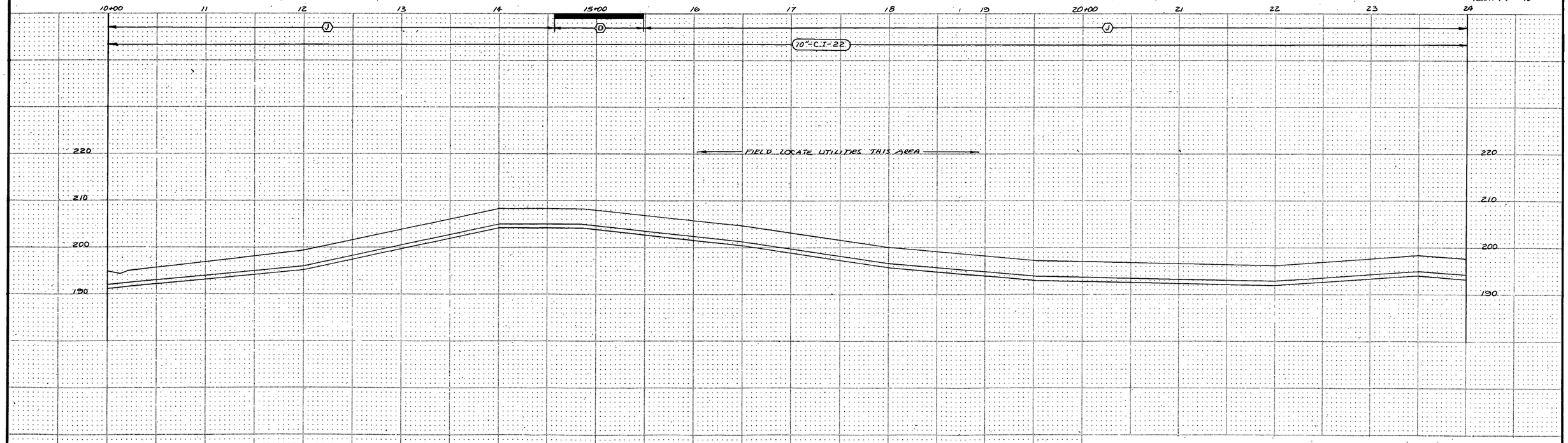
THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"= 1'-0" USE 1/2"= 1'-0" OR 1"= 10' USE 1"= 20'



NOTES:

1. CONTRACTOR SHALL VERIFY IN FIELD ALL EXISTING PIPELINE ELEVATIONS AND TYPES OF PIPELINE CONNECTIONS BEFORE CUTTING EXISTING PIPELINES.
2. LINE SYMBOLS ARE SHOWN ON STANDARD DETAILS 109 & 110.
3. THE COVER OVER PIPELINES SHALL BE 3½ FEET UNLESS CHANGED BY THE ENGINEER OR SHOWN OTHERWISE ON THE PROFILE.
4. STATIONING AND ELEVATIONS ARE GENERALLY ALONG THE "P" LINE. OFFSET DISTANCES TO PIPELINE ARE GENERALLY TO RIGHT OR LEFT OF "P" LINE.

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 10'

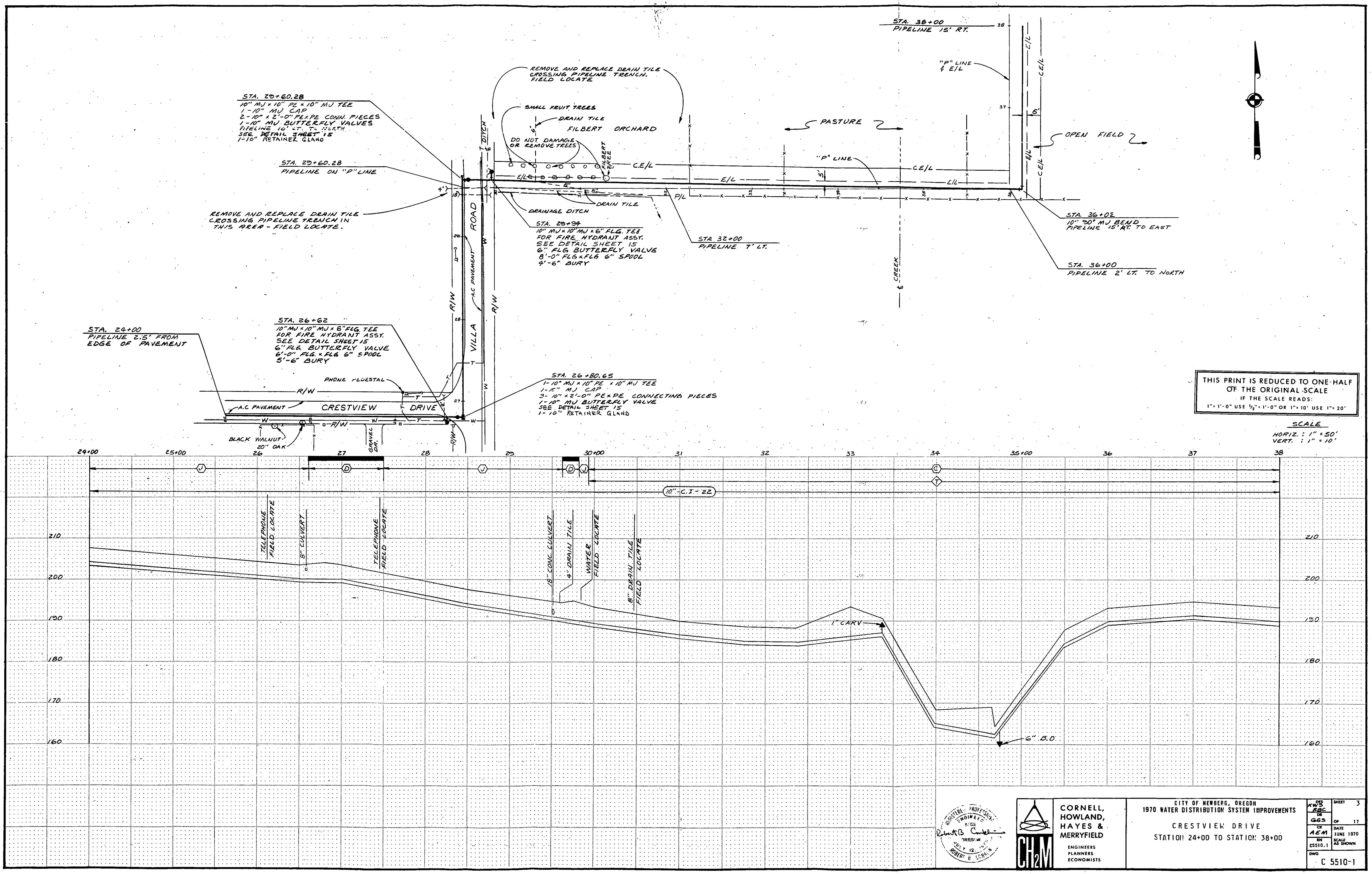


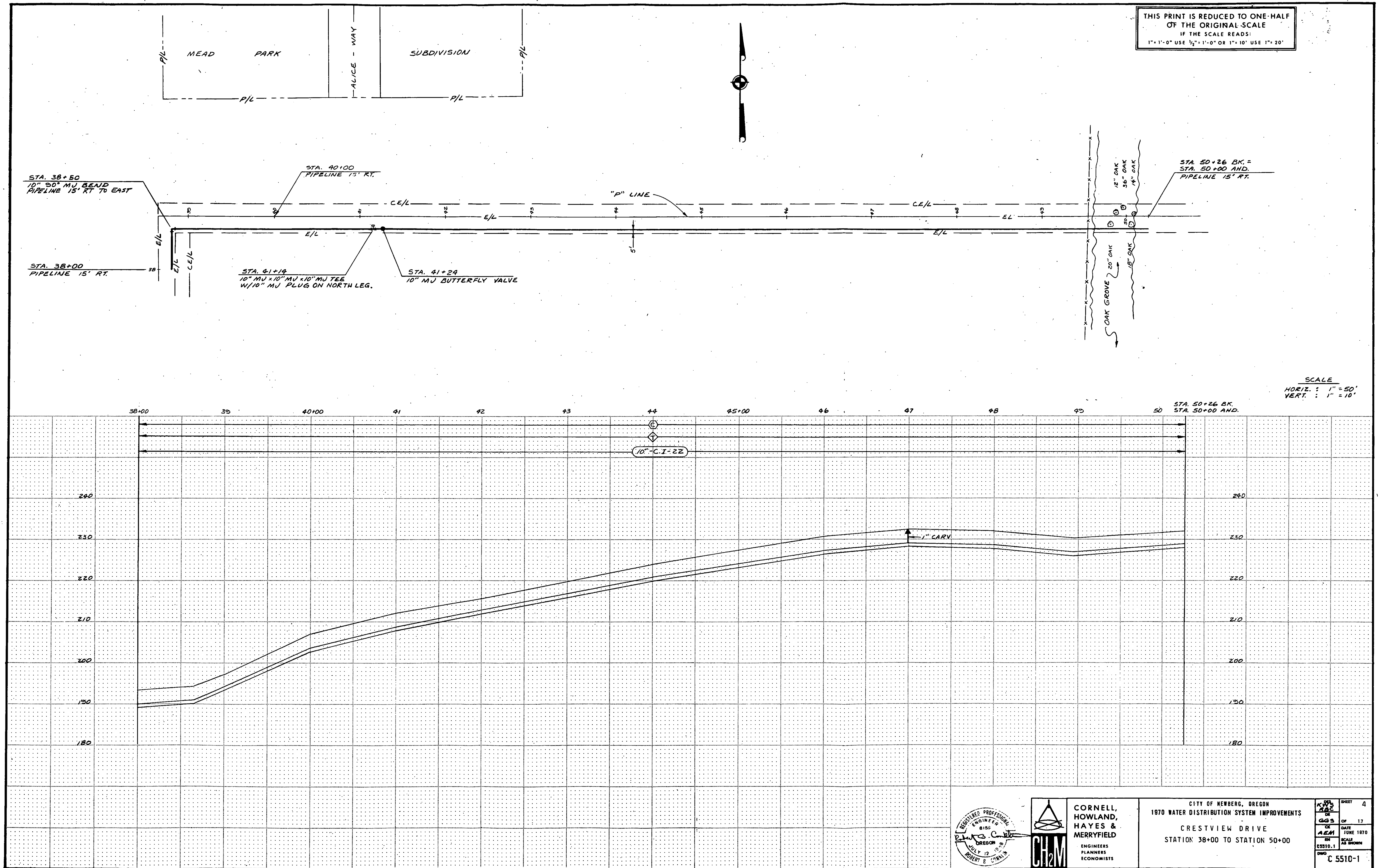
REGISTERED PROFESSIONAL ENGINEER
STATE OF OREGON
ROBERT E. TOMSON

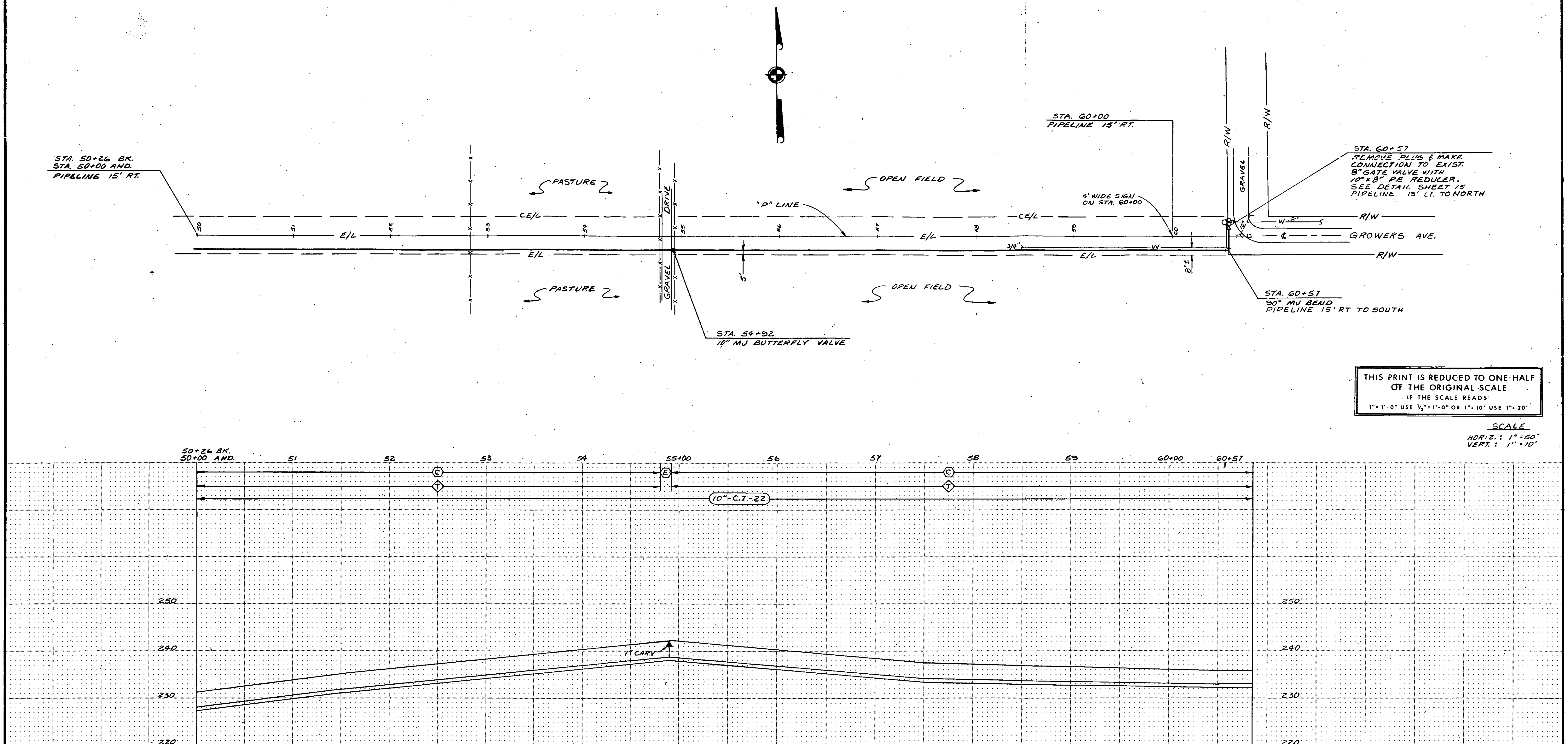
CH2M
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
CRESTVIEW DRIVE
STATION 10+00 TO STATION 24+00

DES. ARC	SHEET 2
DR. GGS	OF 17
CK. AEM	DATE JUNE 1970
JOB NO. C5510.1	SCALE AS SHOWN
DWG NO.	C5510-1


STA. 38+00
PIPELINE 15' RT.
REMOVE AND REPLACE DRAIN TILE CROSSING PIPELINE TRENCH. FIELD LOCATE
STA. 29+60.28
10" MJ x 10" PE x 10" MJ TEE
1 - 10" MJ CAP
2 - 10" x 2'-0" PExPE CONN. PIECES
1 - 10" MJ BUTTERFLY VALVES
PIPELINE 10' LT. TO NORTH
SEE DETAIL SHEET 15
1 - 10" RETAINER GLAND
SMALL FRUIT TREES
DRAIN TILE
FILBERT ORCHARD
DO NOT DAMAGE OR REMOVE TREES
PASTURE
OPEN FIELD
"P" LINE & E/L
"P" LINE
STA. 29+60.28
PIPELINE ON "P" LINE
REMOVE AND REPLACE DRAIN TILE CROSSING PIPELINE TRENCH IN THIS AREA - FIELD LOCATE.
DRAINAGE DITCH
DRAIN TILE
STA. 29+94
10" MJ x 10" MJ x 6" FLG. TEE FOR FIRE HYDRANT ASSY.
SEE DETAIL SHEET 15
6" FLG BUTTERFLY VALVE
8'-0" FLG x FLG 6" SPOOL
4'-6" BURY
STA. 32+00
PIPELINE 7' LT.
STA. 36+02
10" 90° MJ BEND
PIPELINE 15' RT. TO EAST
STA. 36+00
PIPELINE 2' LT. TO NORTH
CREEK
VILLA ROAD
A.C. PAVEMENT
R/W
STA. 24+00
PIPELINE 2.5' FROM EDGE OF PAVEMENT
STA. 26+62
10" MJ x 10" MJ x 6" FLG. TEE FOR FIRE HYDRANT ASSY.
SEE DETAIL SHEET 15
6" FLG. BUTTERFLY VALVE
6'-0" FLG. x FLG 6" SPOOL
5'-6" BURY
PHONE PEDESTAL
STA. 26+80.65
1 - 10" MJ x 10" PE x 10" MJ TEE
1 - 10" MJ CAP
3 - 10" x 2'-0" PExPE CONNECTING PIECES
1 - 10" MJ BUTTERFLY VALVE
SEE DETAIL SHEET 15
1 - 10" RETAINER GLAND
A.C. PAVEMENT
CRESTVIEW DRIVE
BLACK WALNUT
20" OAK
GRAVEL DR.
THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1" = 1'-0" USE 1/2" = 1'-0" OR 1" = 10' USE 1" = 20'
SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'
24+00
25+00
26
27
28
29
30+00
31
32
33
34
35+00
36
37
38
10" - C.I. - 22
TELEPHONE FIELD LOCATE
8" CULVERT
TELEPHONE FIELD LOCATE
18" CONC. CULVERT
4" DRAIN TILE
WATER FIELD LOCATE
8" DRAIN TILE FIELD LOCATE
1" CARV
6" B.O.
210
200
190
180
170
160
REGISTERED PROFESSIONAL ENGINEER
OREGON
ROBERT B. CONKLIN
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS
CH2M
CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
CRESTVIEW DRIVE
STATION 24+00 TO STATION 38+00
DES KWS EBC
DR GGS
CK AEM
RN C5510.1
SHEET 3 OF 17
DATE JUNE 1970
SCALE AS SHOWN
DWG C 5510-1


THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS: 1" = 1'-0" USE 1/2" = 1'-0" OR 1" = 10' USE 1" = 20'
MEAD PARK
ALICE - WAY
SUBDIVISION
P/L
STA. 38+50
10" 90° MJ BEND
PIPELINE 15' RT TO EAST
STA. 40+00
PIPELINE 15' RT.
"P" LINE
CE/L
E/L
STA. 38+00
PIPELINE 15' RT.
STA. 41+14
10" MJ x 10" MJ x 10" MJ TEE
W/10" MJ PLUG ON NORTH LEG.
STA. 41+24
10" MJ BUTTERFLY VALVE
12" OAK
36" OAK
14" OAK
20" OAK
18" OAK
OAK GROVE
STA. 50+26 BK. =
STA. 50+00 AHD.
PIPELINE 15' RT.
SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'
38+00
39
40+00
41
42
43
44
45+00
46
47
48
49
50
STA. 50+26 BK.
STA. 50+00 AHD.
10"-C.I-22
1" CARV
240
230
220
210
200
190
180
REGISTERED PROFESSIONAL ENGINEER
6158
OREGON
JULY 12 1968
ROBERT B. CONKLIN
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS
PLANNERS
ECONOMISTS
CH2M
CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
CRESTVIEW DRIVE
STATION 38+00 TO STATION 50+00
DES KWS RBC
DR GGS
CK AEM
BN C5510.1
SHEET 4
OF 17
DATE JUNE 1970
SCALE AS SHOWN
DWG C 5510-1



THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS: 1" = 1'-0" USE ½" = 1'-0" OR 1" = 10' USE 1" = 20'

SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 10'

REGISTERED PROFESSIONAL ENGINEER 6159 OREGON JULY 12, 1968 ROBERT B. CONKLIN

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE BOISE PORTLAND CORVALLIS

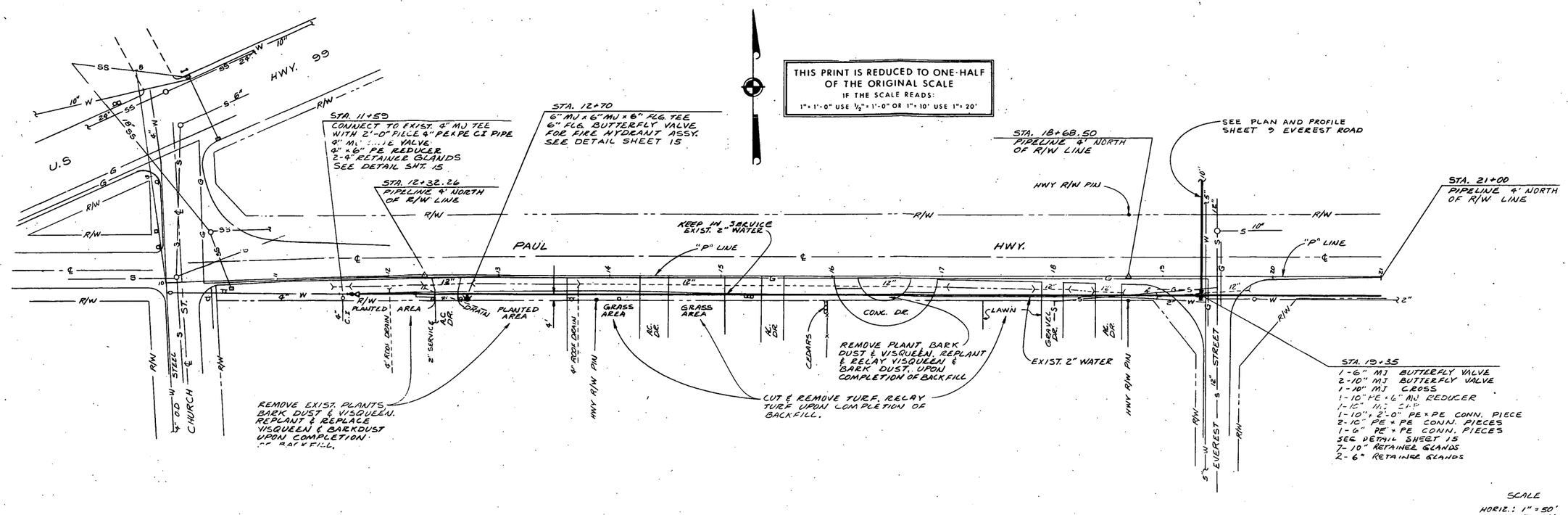
CITY OF NEWBERG OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

CRESTVIEW DRIVE

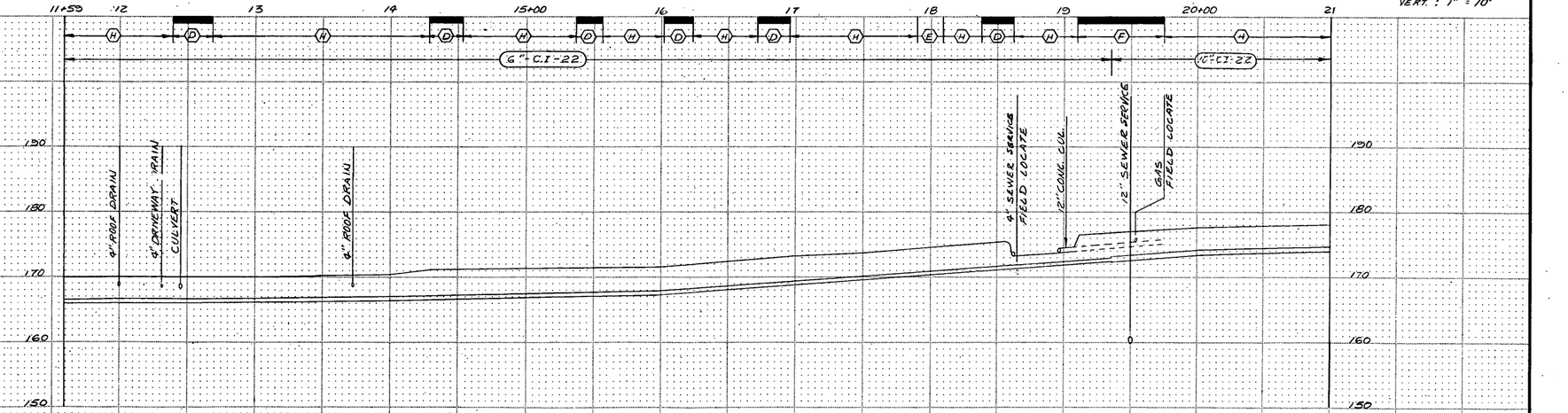
STATION 50+00 TO STATION 60+57

DES RBC KWS	SHEET 5
DR GGS	OF 17
CK AEM	DATE JUNE 1970
RN C5510.1	SCALE AS SHOWN
DWG C 5510-1	

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"= 1'-0" USE 1/2"= 1'-0" OR 1"= 10' USE 1"= 20'



SCALE
HORIZ.: 1" = 50'
VERT. : 1" = 10'



REGISTERED PROFESSIONAL ENGINEER 6159 OREGON JULY 12 1968 ROBERT B. CORNELIN

CH2M

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

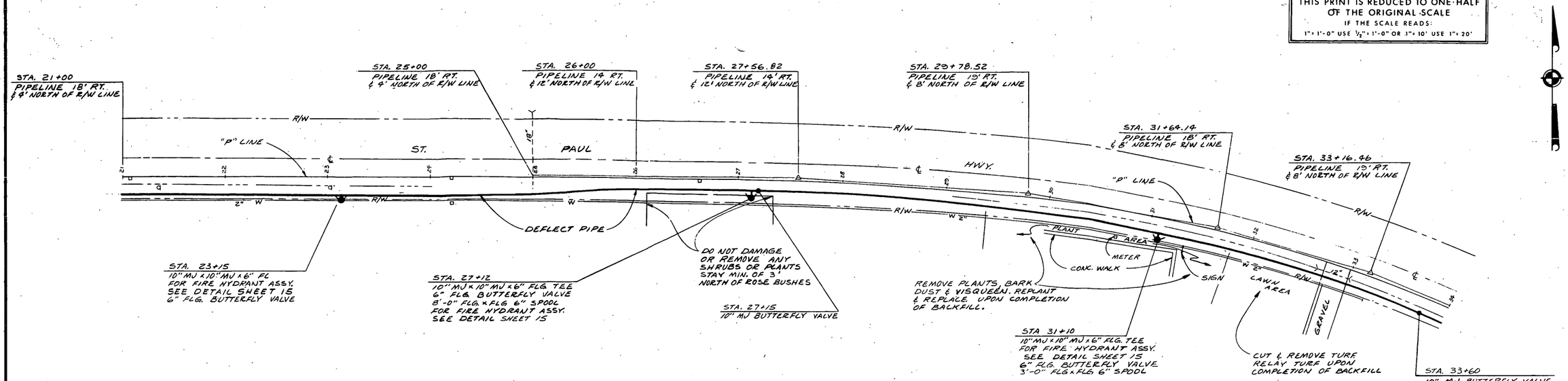
CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

ST. PAUL HIGHWAY

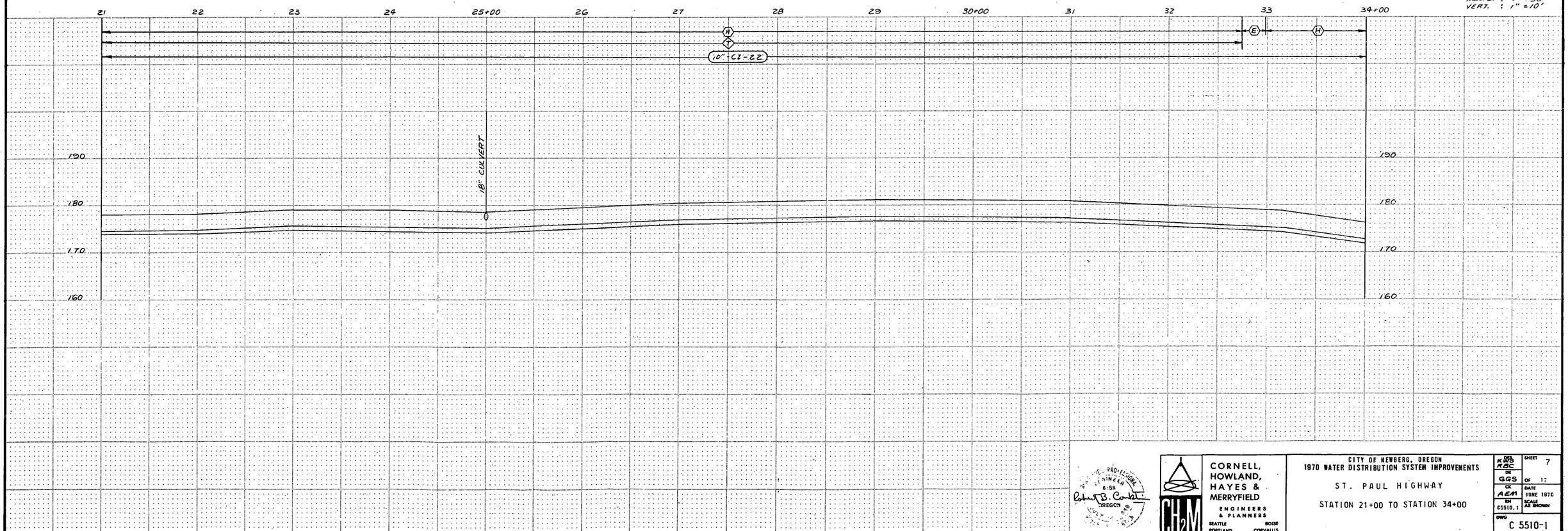
STATION 11+59 TO STATION 21+00

DES KWS RAC	SHEET 6
DR GGS	OF 19
CK A E M	DATE JUNE 1970
BK C5510.1	SCALE AS SHOWN
DWG C 5510-1	

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"= 1'-0" USE ½"= 1'-0" OR 1"= 10' USE 1"= 20'



SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'

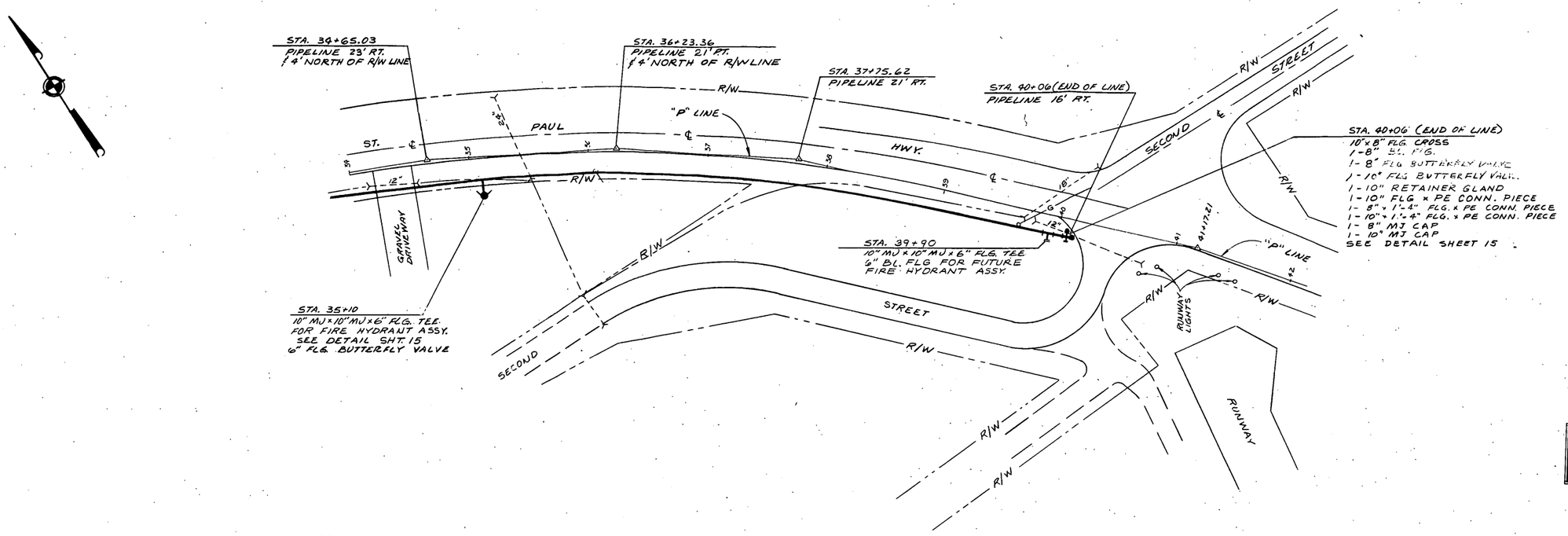


PROFESSIONAL ENGINEER
6-59
Robert B. Cornell
OREGON

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
ST. PAUL HIGHWAY
STATION 21+00 TO STATION 34+00

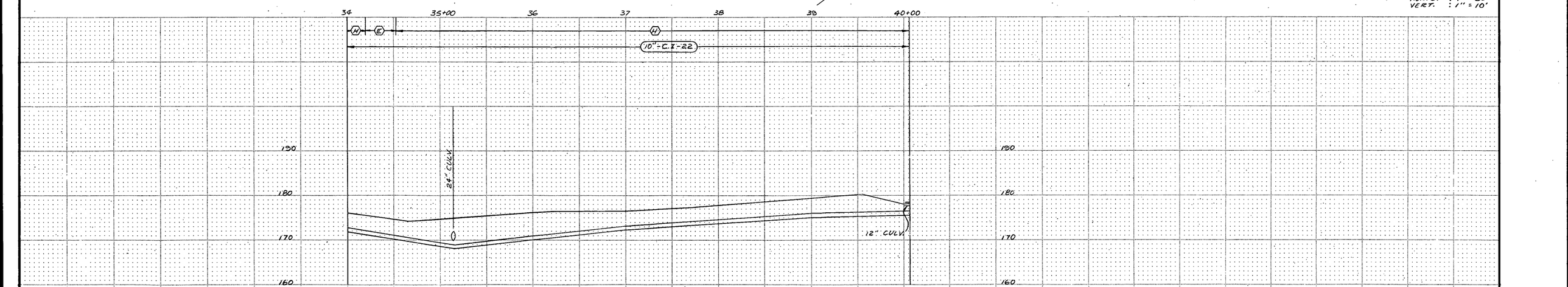
DES. KWS RBC	SHEET 7
DR. GGS	OF 17
CK. AEM	DATE JUNE 1970
JOB NO. C5510.1	SCALE AS SHOWN
DWG. C 5510-1	



THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE

IF THE SCALE READS:
1"=1'-0" USE 1/2"=1'-0" OR 1"=10', USE 1"=20'

SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'



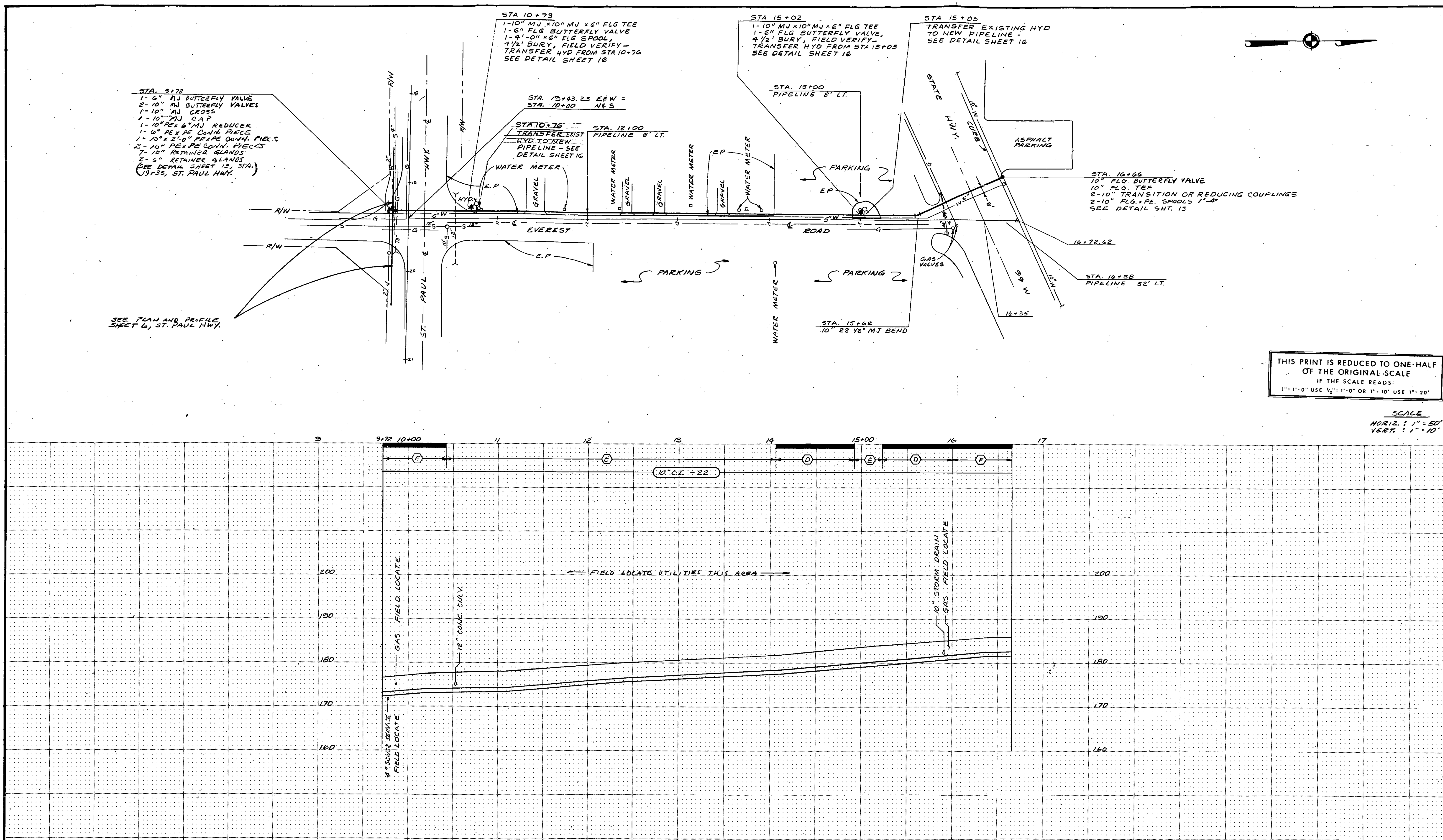
REGISTERED PROFESSIONAL ENGINEER
6155
Robert B. Conklin
OREGON

CH2M
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

ST. PAUL HIGHWAY
STATION 34+00 TO 40+06

RSP RC ANS	SHEET 8
DR GGS	OF 17
CK AEM	DATE JUNE 1970
EN C5510.1	SCALE AS SHOWN
DWG C5510-1	


STA 10+73
1-10" MJ x10" MJ x6" FLG TEE
1-6" FLG BUTTERFLY VALVE
1-4'-0" x6" FLG SPOOL,
4 1/2' BURY, FIELD VERIFY-
TRANSFER HYD FROM STA 10+76
SEE DETAIL SHEET 16
STA 15+02
1-10" MJ x10" MJ x6" FLG TEE
1-6" FLG BUTTERFLY VALVE,
4 1/2' BURY, FIELD VERIFY-
TRANSFER HYD FROM STA 15+05
SEE DETAIL SHEET 16
STA 15+05
TRANSFER EXISTING HYD
TO NEW PIPELINE -
SEE DETAIL SHEET 16
STA. 9+72
1-6" MJ BUTTERFLY VALVE
2-10" MJ BUTTERFLY VALVES
1-10" MJ CROSS
1-10" MJ CAP
1-10" PE x 6" MJ REDUCER
1-6" PE x PE CONN. PIECE
1-10" x 2'-0" PE x PE CONN. PIECE
2-10" PE x PE CONN. PIECES
7-10" RETAINER GLANDS
2-6" RETAINER GLANDS
(SEE DETAIL SHEET 15, STA. 19+35, ST. PAUL HWY.)
STA. 19+43.23 E&W =
STA. 10+00 N&S
STA 10+76
TRANSFER EXIST
HYD TO NEW
PIPELINE - SEE
DETAIL SHEET 16
STA. 12+00
PIPELINE 8' LT.
STA. 15+00
PIPELINE 8' LT.
STATE HWY.
CURB
ASPHALT PARKING
WATER METER
GRAVEL
EP
PARKING
EVEREST
ROAD
ST. PAUL HWY.
R/W
HYD
E.P
STA. 16+66
10" FLG. BUTTERFLY VALVE
10" FLG. TEE
2-10" TRANSITION OR REDUCING COUPLINGS
2-10" FLG. x PE. SPOOLS 1'-4"
SEE DETAIL SHT. 15
16+72.62
STA. 16+58
PIPELINE 52' LT.
16+35
GAS VALVES
99 W
STA. 15+62
10" 22 1/2" MJ BEND
SEE PLAN AND PROFILE SHEET 6, ST. PAUL HWY.
THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"=1'-0" USE 1/2"=1'-0" OR 1"=10' USE 1"=20'
SCALE
HORIZ.: 1" = 50'
VERT.: 1" = 10'
9
9+72 10+00
11
12
13
14
15+00
16
17
F
E
D
E
D
F
10" C.I. -22
200
190
180
170
160
FIELD LOCATE UTILITIES THIS AREA
GAS FIELD LOCATE
12" CONC. CULV.
4" SEWER SERVICE FIELD LOCATE
10" STORM DRAIN
GAS FIELD LOCATE

REGISTERED PROFESSIONAL ENGINEER 615 OREGON

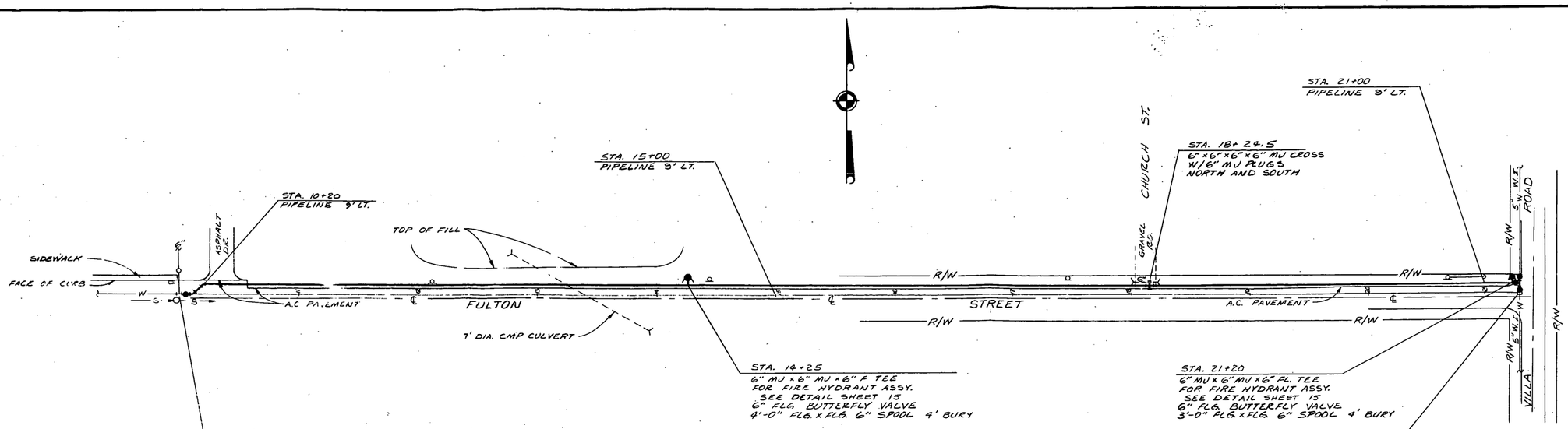
CH2M

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

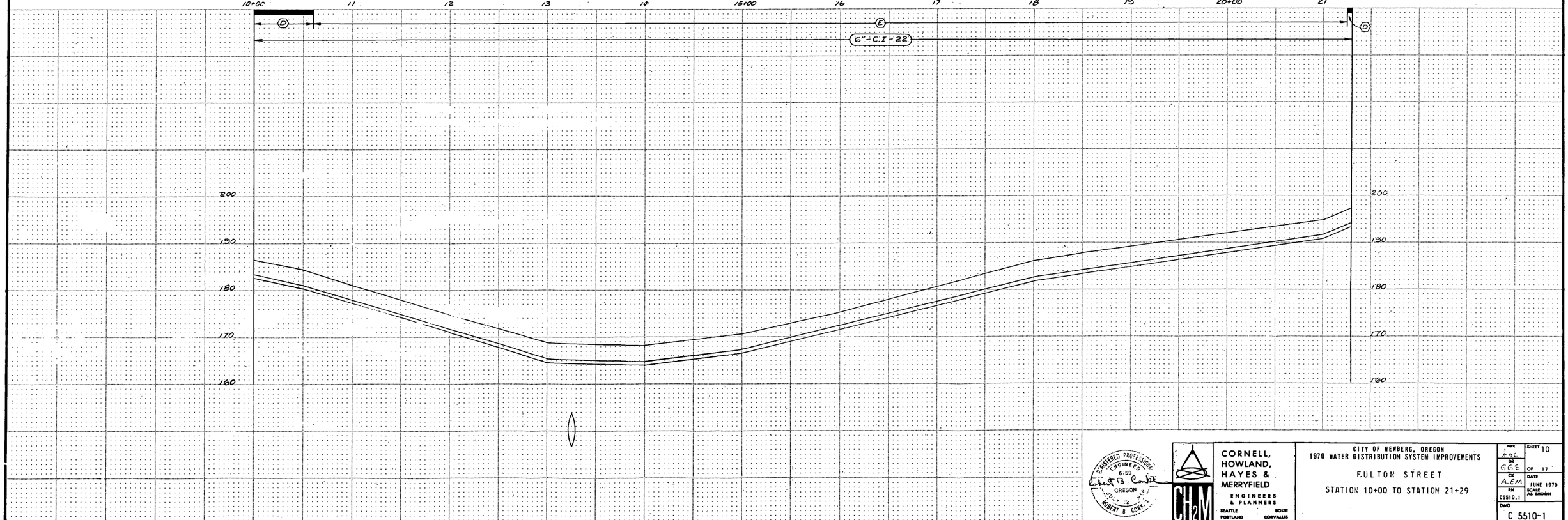
EVEREST ROAD
STATION 9+72 TO STATION 16+66

DES RBC KWE	SHEET 9
DR GGS	OF 17
CK AEM	DATE JUNE 1970
EN C5510.1	SCALE AS SHOWN
DWG C 5510-1	



THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1" = 1'-0" USE ½" = 1'-0" OR 1" = 10' USE 1" = 20'

SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'



REGISTERED PROFESSIONAL ENGINEER
6159
OREGON
ROBERT B. CONNELL

CH2M

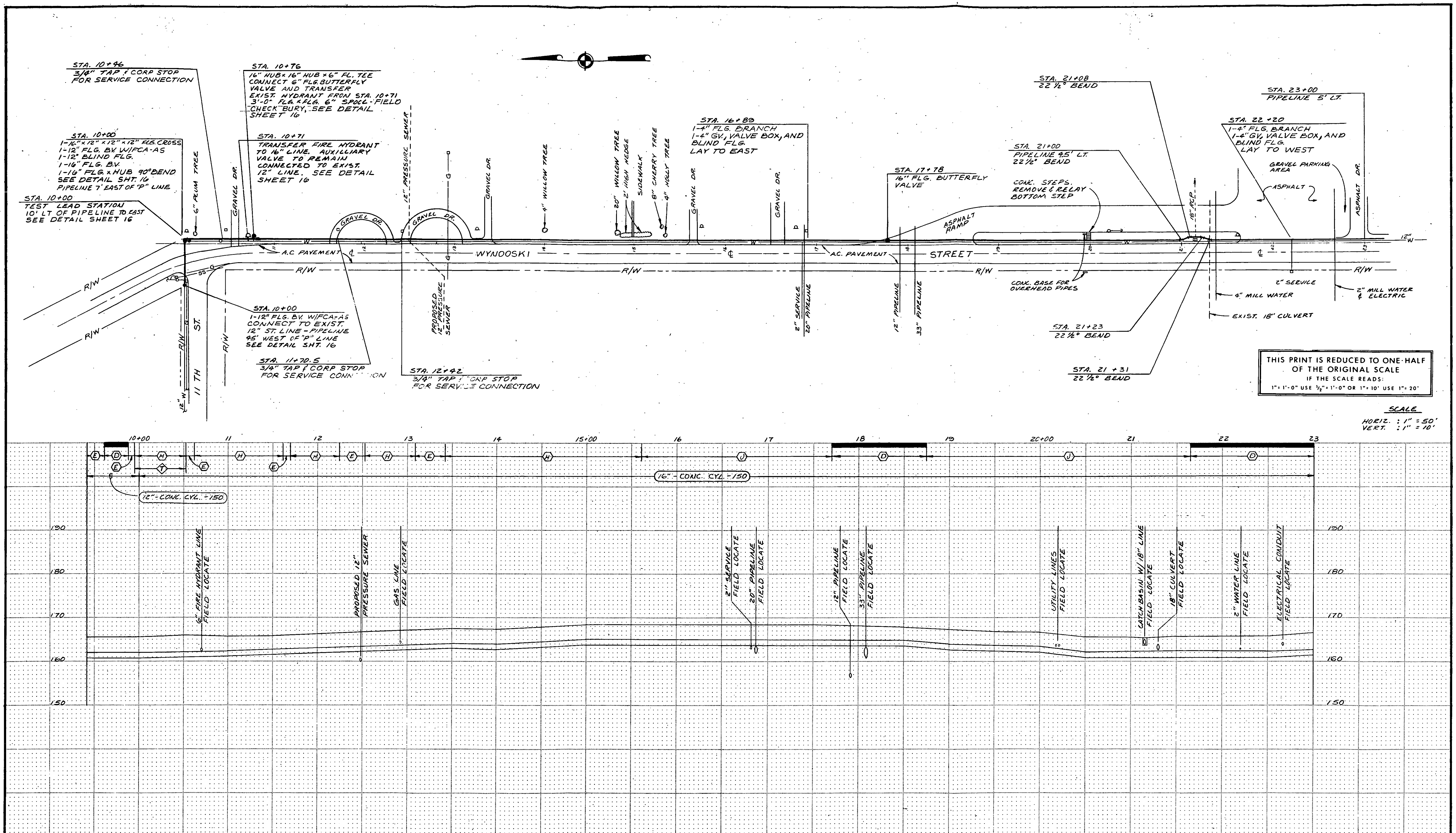
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

FULTON STREET

STATION 10+00 TO STATION 21+29

DES. KHC	SHEET 10
DR. GGS	OF 17
CK. A.E.M.	DATE JUNE 1970
EN. C5510.1	SCALE AS SHOWN
DWG. C 5510-1	


STA. 10+46
3/4" TAP & CORP STOP FOR SERVICE CONNECTION
STA. 10+76
16" HUB x 16" HUB x 6" FL. TEE CONNECT 6" FLG. BUTTERFLY VALVE AND TRANSFER EXIST. HYDRANT FROM STA. 10+71 3'-0" FLG. x FLG. 6" SPOOL - FIELD CHECK BURY, SEE DETAIL SHEET 16
STA. 10+00
1-16" x 12" x 12" x 12" FLG. CROSS
1-12" FLG. B.V. W/FCA-AS
1-12" BLIND FLG.
1-16" FLG. B.V.
1-16" FLG. x HUB 90° BEND
SEE DETAIL SHT. 16
PIPELINE 7' EAST OF "P" LINE
STA. 10+71
TRANSFER FIRE HYDRANT TO 16" LINE. AUXILLIARY VALVE TO REMAIN CONNECTED TO EXIST. 12" LINE. SEE DETAIL SHEET 16
STA. 10+00
TEST LEAD STATION 10' LT OF PIPELINE TO EAST SEE DETAIL SHEET 16
STA. 16+89
1-4" FLG. BRANCH
1-4" GV, VALVE BOX, AND BLIND FLG.
LAY TO EAST
STA. 17+78
16" FLG. BUTTERFLY VALVE
STA. 21+08
22 1/2° BEND
STA. 21+00
PIPELINE 4.5' LT.
22 1/2° BEND
CONC. STEPS. REMOVE & RELAY BOTTOM STEP
STA. 23+00
PIPELINE 5' LT.
STA. 22+20
1-4" FLG. BRANCH
1-4" GV, VALVE BOX, AND BLIND FLG.
LAY TO WEST
GRAVEL PARKING AREA
ASPHALT
ASPHALT DR.
ASPHALT RAMP
6" PLUM TREE
GRAVEL DR.
12" PRESSURE SEWER
4" WILLOW TREE
20" WILLOW TREE
2' HIGH HEDGE
SIDEWALK
6" CHERRY TREE
4" HOLLY TREE
18" FCP
A.C. PAVEMENT
WYNOOSKI
STREET
R/W
11 TH ST.
PROPOSED 12" PRESSURE SEWER
2" SERVICE
20" PIPELINE
12" PIPELINE
33" PIPELINE
CONC. BASE FOR OVERHEAD PIPES
2" SERVICE
4" MILL WATER
2" MILL WATER
¢ ELECTRIC
EXIST. 18" CULVERT
STA. 10+00
1-12" FLG. B.V. W/FCA-AS
CONNECT TO EXIST. 12" ST. LINE - PIPELINE 45' WEST OF "P" LINE
SEE DETAIL SHT. 16
STA. 11+70.5
3/4" TAP & CORP STOP FOR SERVICE CONNECTION
STA. 12+42
3/4" TAP & CORP STOP FOR SERVICE CONNECTION
STA. 21+23
22 1/2° BEND
STA. 21+31
22 1/2° BEND
THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1" = 1'-0" USE 1/2" = 1'-0" OR 1" = 10' USE 1" = 20'
SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'
10+00
11
12
13
14
15+00
16
17
18
19
20+00
21
22
23
16" - CONC. CYL. - 150
12" - CONC. CYL. - 150
190
180
170
160
150
6" FIRE HYDRANT LINE FIELD LOCATE
PROPOSED 12" PRESSURE SEWER
GAS LINE FIELD LOCATE
2" SERVICE FIELD LOCATE
20" PIPELINE FIELD LOCATE
12" PIPELINE FIELD LOCATE
33" PIPELINE FIELD LOCATE
UTILITY LINES FIELD LOCATE
CATCH BASIN W/18" LINE FIELD LOCATE
18" CULVERT FIELD LOCATE
2" WATER LINE FIELD LOCATE
ELECTRICAL CONDUIT FIELD LOCATE
REGISTERED PROFESSIONAL ENGINEER
5946
OREGON
JULY 14 1967
ARCHIE E. MEADOWS
Archie E. Meadows

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE BOISE PORTLAND CORVALLIS

CH2M

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

WYNOOSKI STREET
STATION 10+00 TO STATION 23+00

DES RBC	SHEET 11		
DR KWS GGS	OF 17		
CK AEM	DATE JUNE 1970		
RN C5510.1	SCALE AS SHOWN		
DWG C5510-1			

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE

IF THE SCALE READS:
1"= 1'-0" USE 1/2"= 1'-0" OR 1"= 10' USE 1"= 20'

STA. 23+21
TRANSFER FIRE HYDRANT TO 16" LINE. AUXILLIARY VALVE TO REMAIN CONNECTED TO EXIST. 12" LINE. SEE DETAIL SHEET 16

STA. 23+26
16" HUB x 16" HUB x 6" FLG. TEE CONNECT 6" FLG. BUTTERFLY VALVE AND TRANSFER EXIST. HYDRANT FROM STA. 23+21. 2'-0" FLG. x FLG. 6" SPOOL - FIELD CHECK BURY. SEE DETAIL SHEET 16

STA. 23+39
TEST LEAD STATION - 8' LT OF PIPELINE SEE DETAIL SHEET 16

STA. 23+00
PIPELINE 5' LT.

STA. 26+40
16 FLG. BUTTERFLY VALVE

STA. 28+00
PIPELINE 5' LT.

STA. 28+93
1-4" FLG. BRANCH
1-4" GV. VALVE BOX, AND BLIND FLG
LAY TO WEST

STA. 32+00
PIPELINE 6' LT.

STA. 32+64
16" 90° BEND
PIPELINE 28' RT. OF "P" LINE

STA. 32+48.66 (TRANS. LINE)
"P" LINE - BEGIN 24" PIPELINE - MAKE JOINT FOR PE CONNECTION FOR MECH COUPLING TO 24" OD STEEL PIPE, CONNECTION TO BE MADE AND COUPLING TO BE SUPPLIED BY OTHERS. PROVIDE 2 THRUST TIE LUGS FOR 5/8" THRUST RODS. (TEST LEAD STATION - 8' RIGHT OF PIPELINE, SEE DETAIL SHT. 16)

STA. 32+56.22
"P" LINE 16" PIPELINE

STA. 32+76
16" HUB x 16" HUB x 6" F TEE AND FIRE HYDRANT ASSY. 6" FLG. BUTTERFLY VALVE 4'-0" FLG. x FLG. 6" SPOOL - 5½' BURY SEE DETAIL SHEET 15

STA. 33+28.67
"P" LINE - 24" PIPELINE

STA. 33+28.75
75° HORIZ. BEND

STA. 34+31
(TEST LEAD STATION - 10' RT OF PIPELINE SEE DETAIL SHEET 16)
MAKE SPIGOT END JOINT FOR CONNECTION TO 16" CONC. CYL. PIPE

STA. 34+31 & ST. 35+06.75
END PIPELINES, WATER TREATMENT PLANT CONTRACTOR TO MAKE CONNECTION BETWEEN PLANT AND PIPELINES

STA. 34+56.08
"P" LINE - 16" PIPELINE

STA. 35+06.75
(TEST LEAD STATION - 6' RT. OF PIPELINE SEE DETAIL SHEET 16)
MAKE SPIGOT END JOINT FOR CONNECTION TO 24" CONC. CYL. PIPE

STA. 35+64.75
"P" LINE - 24" PIPELINE

16" CONCRETE CYLINDER PIPELINE

24" CONCRETE CYLINDER PIPELINE

WATER TREATMENT PLANT

PARKING AREA

GRAVEL DR.

ASPHALT DR.

CONC. SLAB

A.C. PAVEMENT

WYNOOSKI STREET

"P" LINE

R/W

12" TEL. CABLE

10" PIPELINE

24" FIBERGLASS

4" SERVICE

20" PIPELINE

24" PIPELINE

20" PIPELINE

20" TREE

12" TREE

8' BRIDGE

SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'

23+00 24 25+00 26 27 28 29 30+00 31 32 33 34 34+

16"-CONC. CYL.-150

24"-CONC. CYL.-100

FIRE HYDRANT
10" PIPELINE FIELD LOCATE
24" FIBERGLASS
8" WATER LINE FIELD LOCATE
24" SEWER FIELD LOCATE
8" SS LINE FIELD LOCATE
ELECTRICAL CONDUIT FIELD LOCATE
TELEPHONE CONDUIT FIELD LOCATE
PIPELINES FIELD LOCATE
12" WATER LINE FIELD LOCATE
12" WATER LINE FIELD LOCATE

GROUND PROFILE 16" PIPELINE
GROUND PROFILE 24" PIPELINE

16" FL. = 159.54
24" FL. = 157.71

MAINTAIN ELEV. SHOWN

STA. 32+48.66 24" PIPELINE ONLY
STA. 35+06.75 24" PIPELINE
STA. 34+31 16" PIPELINE

150 160 170 180 150

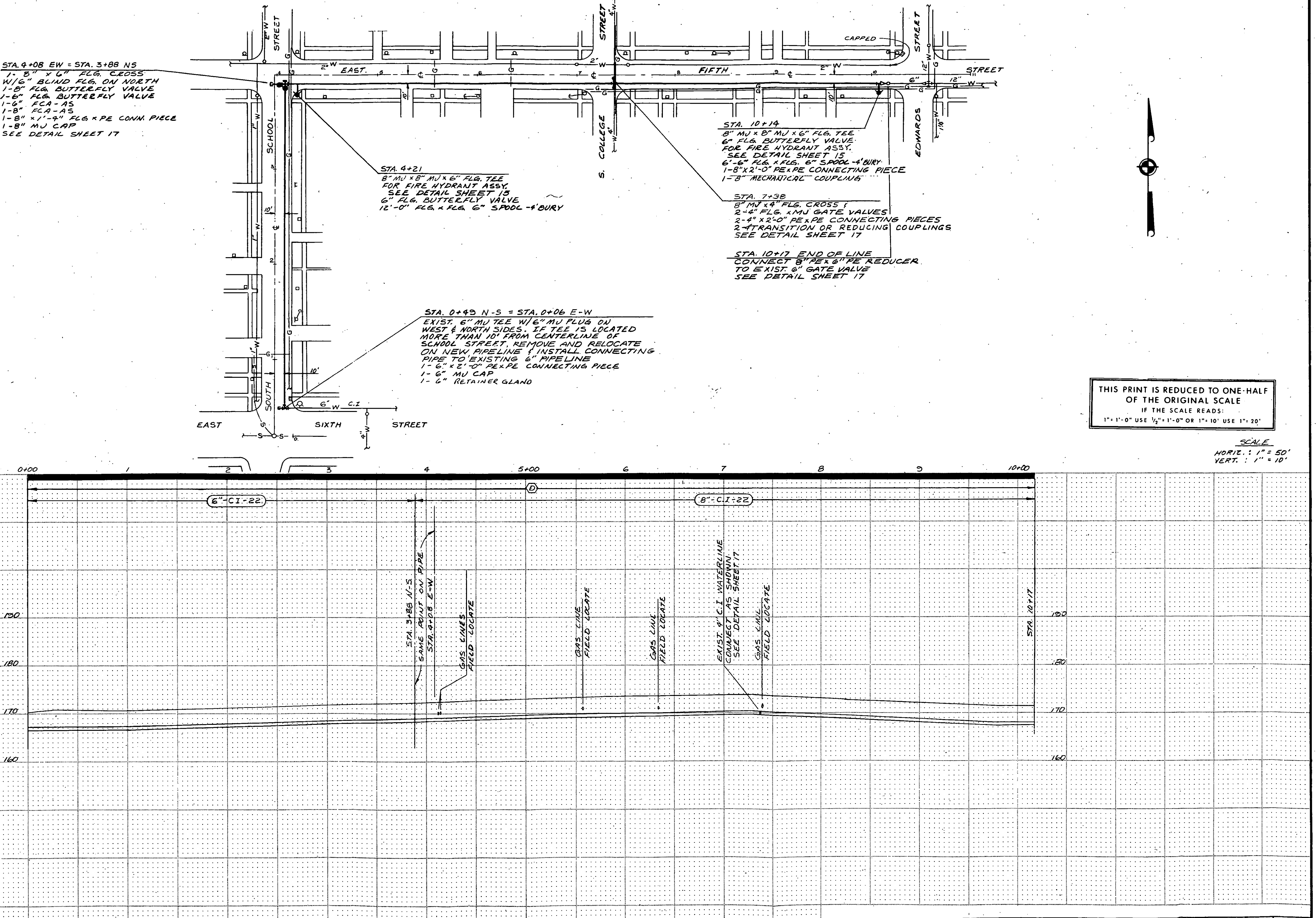
REGISTERED PROFESSIONAL ENGINEER 5946 OREGON JULY 14, 1967 ARCHIE E. MEADOWS

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE PORTLAND BOISE CORVALLIS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

WYNOOSKI STREET
STATION 23+00 TO STATION 34+31-16"
STATION 32+48 TO STATION 35+06-24"

DR KWS R&C	SHEET 12
CK GG3	OF 17
CK AEM	DATE JUNE 1970
EN C5510.1	SCALE AS SHOWN
DWG	C 5510-1



STA. 4+08 EW = STA. 3+88 NS
1- 8" x 6" FLG. CROSS
W/6" BLIND FLG. ON NORTH
1-8" FLG. BUTTERFLY VALVE
1-6" FLG. BUTTERFLY VALVE
1-6" FCA-AS
1-8" FCA-AS
1-8" x 1'-4" FLG. x PE CONN. PIECE
1-8" MJ CAP
SEE DETAIL SHEET 17
STA. 4+21
8" MJ x 8" MJ x 6" FLG. TEE
FOR FIRE HYDRANT ASSY.
SEE DETAIL SHEET 15
6" FLG. BUTTERFLY VALVE
12'-0" FLG. x FLG. 6" SPOOL -4' BURY
STA. 10+14
8" MJ x 8" MJ x 6" FLG. TEE
6" FLG. BUTTERFLY VALVE
FOR FIRE HYDRANT ASSY.
SEE DETAIL SHEET 15
6'-6" FLG. x FLG. 6" SPOOL -4' BURY
1-8" x 2'-0" PE x PE CONNECTING PIECE
1-8" MECHANICAL COUPLING
STA. 7+38
8" MJ x 4" FLG. CROSS &
2-4" FLG. x MJ GATE VALVES
2-4" x 2'-0" PE x PE CONNECTING PIECES
2-4" TRANSITION OR REDUCING COUPLINGS
SEE DETAIL SHEET 17
STA. 10+17 END OF LINE
CONNECT 8" PE x 6" PE REDUCER
TO EXIST. 6" GATE VALVE
SEE DETAIL SHEET 17
STA. 0+49 N-S = STA. 0+06 E-W
EXIST. 6" MJ TEE W/6" MJ PLUG ON
WEST & NORTH SIDES. IF TEE IS LOCATED
MORE THAN 10' FROM CENTERLINE OF
SCHOOL STREET, REMOVE AND RELOCATE
ON NEW PIPELINE & INSTALL CONNECTING
PIPE TO EXISTING 6" PIPELINE
1-6" x 2'-0" PE x PE CONNECTING PIECE
1-6" MJ CAP
1-6" RETAINER GLAND
EAST FIFTH STREET
SOUTH SCHOOL STREET
S. COLLEGE STREET
EDWARDS STREET
EAST SIXTH STREET
CAPPED
6"-C.I.-22
8"-C.I.-22
STA. 3+88 N-S SAME POINT ON PIPE STA. 4+08 E-W
GAS LINES FIELD LOCATE
GAS LINE FIELD LOCATE
EXIST. 4" C.I. WATERLINE CONNECT AS SHOWN SEE DETAIL SHEET 17
STA. 10+17
0+00
5+00
10+00
190
180
170
160

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1" = 1'-0" USE 1/2" = 1'-0" OR 1" = 10' USE 1" = 20'

SCALE
HORIZ. : 1" = 50'
VERT. : 1" = 10'

REGISTERED PROFESSIONAL ENGINEER 6:59 OREGON JULY 12, 1968 ROBERT B. CONKLIN

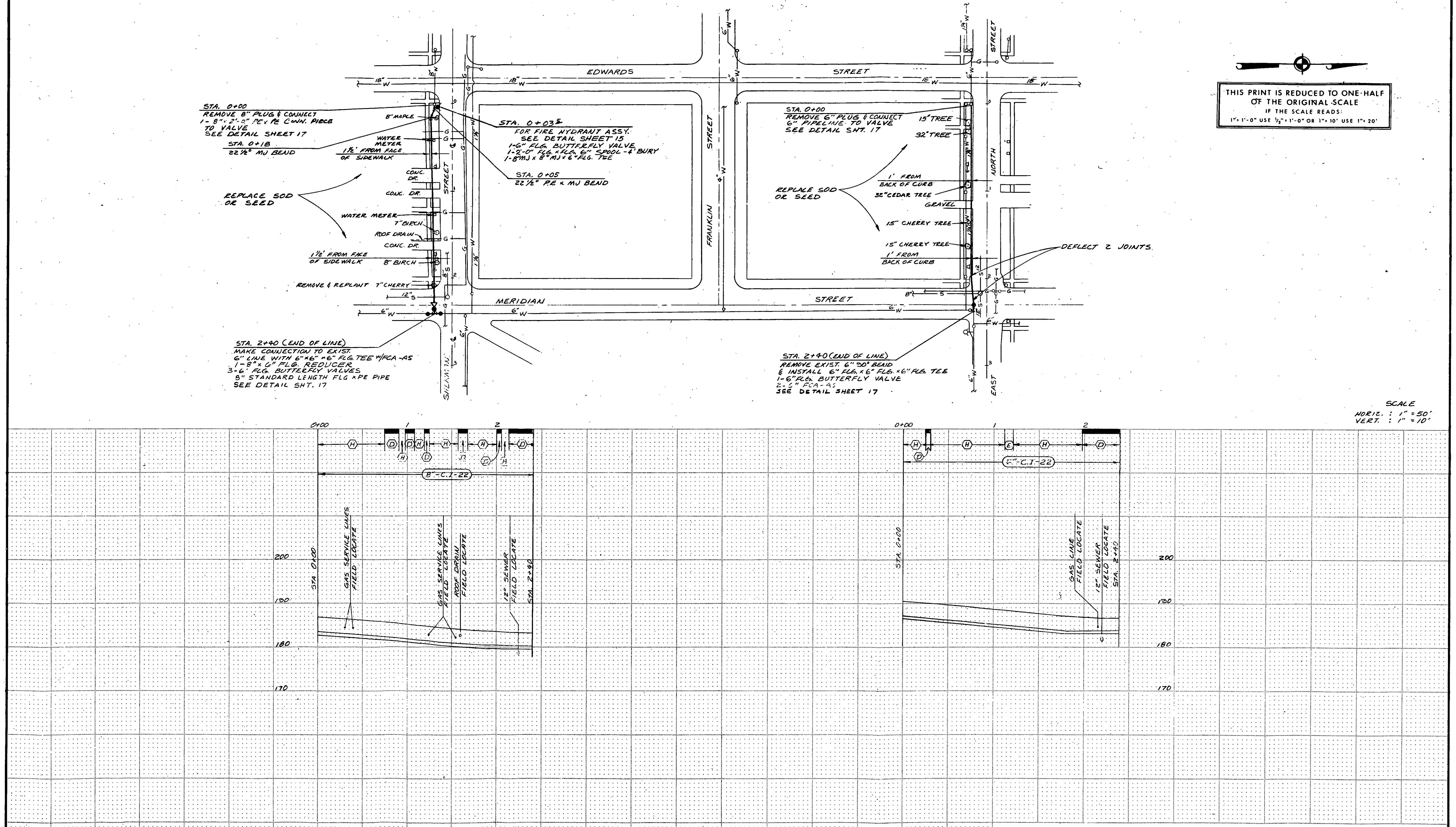
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE BOISE PORTLAND CORVALLIS
CH2M

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

SCHOOL STREET & FIFTH STREET

STATION 0+49 TO STATION 10+17

DES KWS RBC	SHEET 13	
DR GGS	OF 17	
CK AEM	DATE JUNE 1970	
BN C5510.1	SCALE AS SHOWN	
DWG C 5510-1		



REGISTERED PROFESSIONAL ENGINEER 6159 OREGON — Robert B. Conklin

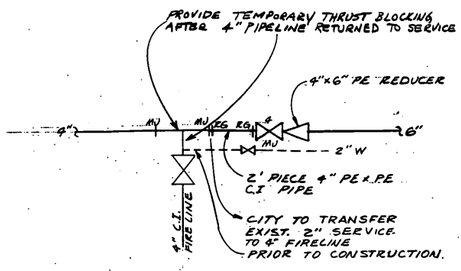
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS & PLANNERS
SEATTLE BOISE PORTLAND CORVALLIS
CH2M

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

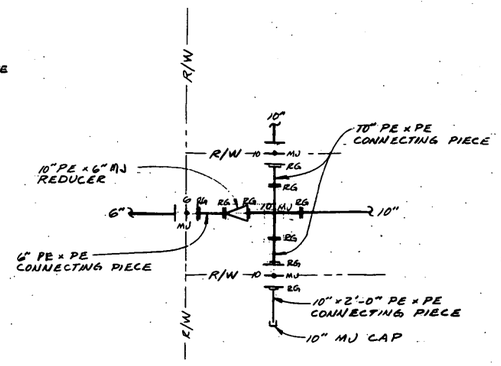
SHERMAN STREET & NORTH STREET

STA. 0+00 TO STA. 2+40 STA. 0+00 TO STA. 2+40

DES KWS RBC	SHEET 14
DR GGS	OF 17
CK AEM	DATE JUNE 1970
RN C5510.1	SCALE AS SHOWN
DWG C 5510-1	

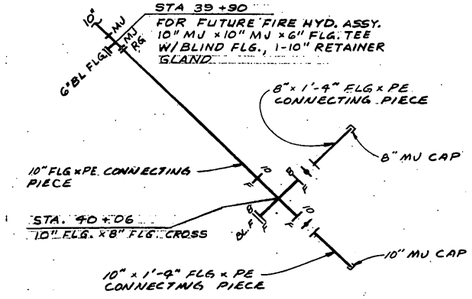


STA. 11+59



NOTE: PLACE ALL VALVES ON PROJECTED PROPERTY OR RIGHT OF WAY LINES.

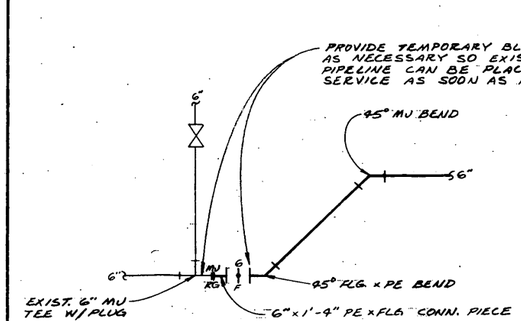
STA. 19+35



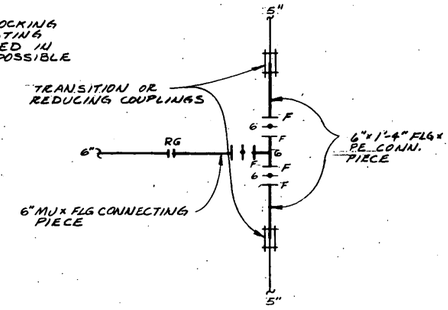
STA. 40+06

ST. PAUL HWY.

N.T.S



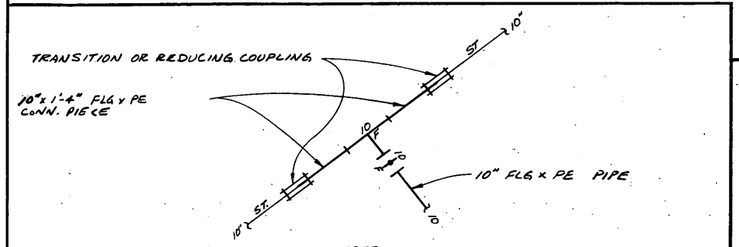
STA. 10+00



STA. 21+29

FULTON STREET

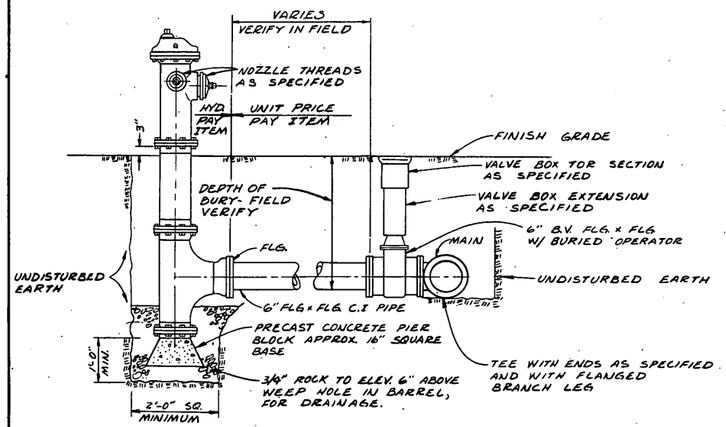
N.T.S



NOTE:
PROVIDE TEMPORARY BLOCKING UNTIL A MINIMUM OF TWO STAND. LENGTHS OF PIPE ARE INSTALLED AND BACKFILLED, AND THE CONCRETE THRUST BLOCK REACHES SPECIFIED STRENGTH.

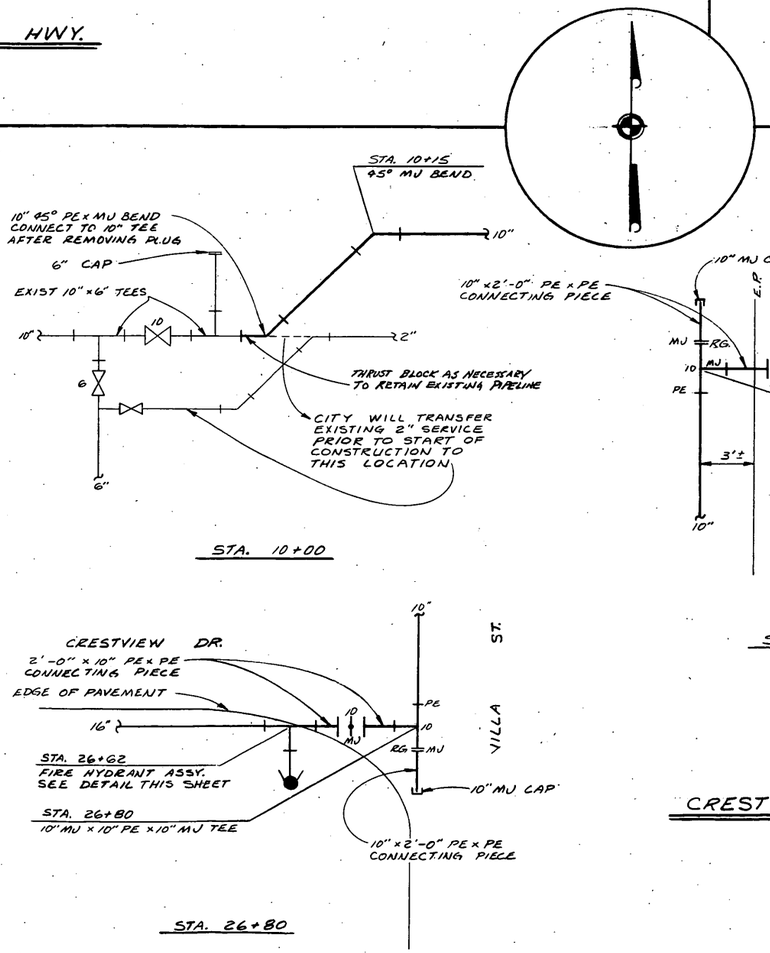
STA. 16+66

EVEREST ROAD



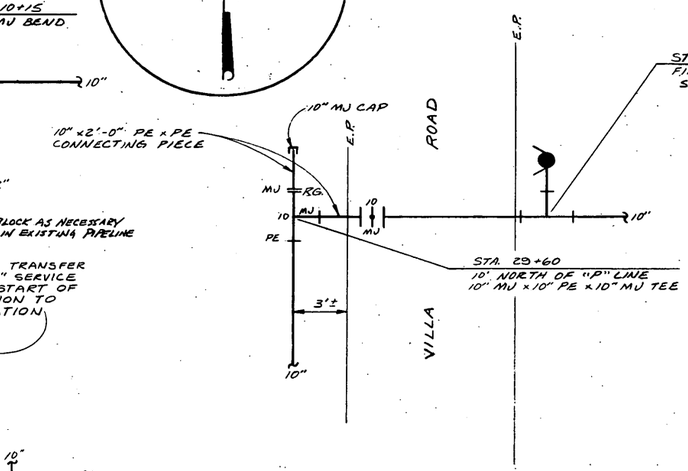
FIRE HYDRANT ASSEMBLY

N.T.S



STA. 10+00

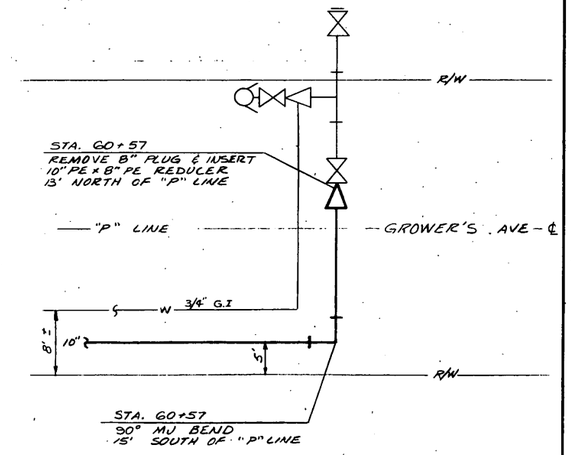
STA. 26+80



STA. 29+60

CRESTVIEW DRIVE

N.T.S



STA. 60+57

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"=1'-0" USE 1/2"=1'-0" OR 1"=10' USE 1"=20'

REGISTERED PROFESSIONAL ENGINEER 5948 OREGON JULY 14 1967 ARCHIE E. MEADOWS

CH2M

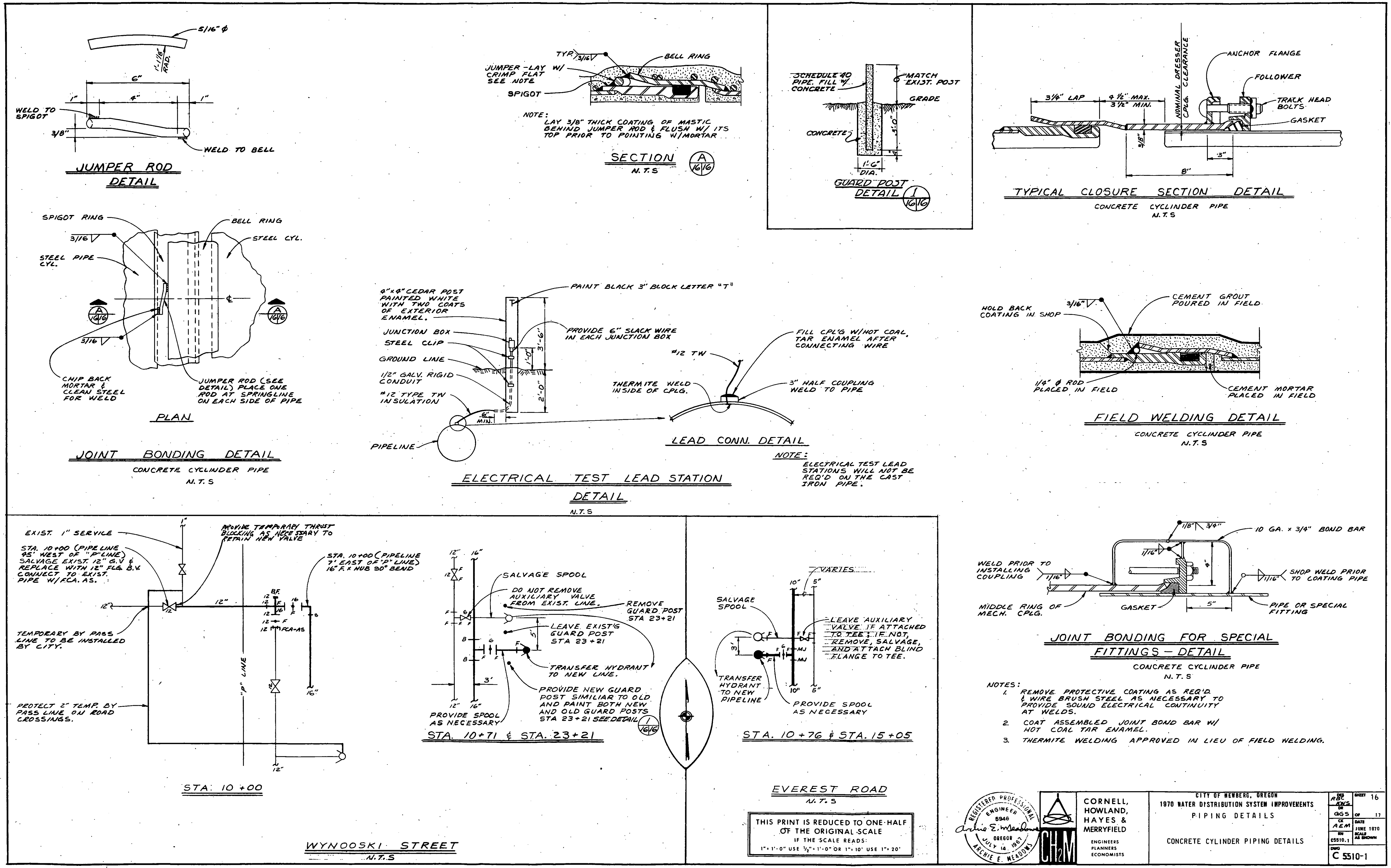
CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

PIPING DETAILS

DES. KWS		SHEET	15
DR. GGS		OF	17
CK. AEM		DATE	JUNE 1970
PROJ. C5510.1		SCALE	AS SHOWN

DWG C 5510-1



5/16" φ
1-1/16" RAD.
6"
1"
4"
1"
WELD TO SPIGOT
3/8"
WELD TO BELL
JUMPER ROD DETAIL
TYP. 3/16
BELL RING
JUMPER-LAY W/ CRIMP FLAT SEE NOTE
SPIGOT
NOTE: LAY 3/8" THICK COATING OF MASTIC BEHIND JUMPER ROD & FLUSH W/ ITS TOP PRIOR TO POINTING W/MORTAR
SECTION A 16/16
N.T.S
SCHEDULE 40 PIPE. FILL W/ CONCRETE
MATCH EXIST. POST
GRADE
CONCRETE
3'-0"
1'-6" DIA.
GUARD POST DETAIL 1 16/16
3 1/4" LAP
4 1/2" MAX. 3 1/2" MIN.
NOMINAL DRESSER CPLG. CLEARANCE
ANCHOR FLANGE
FOLLOWER
TRACK HEAD BOLTS
GASKET
3/8"
3"
8"
TYPICAL CLOSURE SECTION DETAIL
CONCRETE CYLINDER PIPE
N.T.S
SPIGOT RING
BELL RING
3/16
STEEL CYL.
STEEL PIPE CYL.
A 16/16
3/16
CHIP BACK MORTAR & CLEAN STEEL FOR WELD
JUMPER ROD (SEE DETAIL) PLACE ONE ROD AT SPRINGLINE ON EACH SIDE OF PIPE
PLAN
JOINT BONDING DETAIL
CONCRETE CYCLINDER PIPE
N.T.S
4"x4" CEDAR POST PAINTED WHITE WITH TWO COATS OF EXTERIOR ENAMEL.
PAINT BLACK 3" BLOCK LETTER "T"
JUNCTION BOX
STEEL CLIP
GROUND LINE
1/2" GALV. RIGID CONDUIT
#12 TYPE TW INSULATION
PROVIDE 6" SLACK WIRE IN EACH JUNCTION BOX
3'-6"
1'-0"
2'-0"
6" MIN.
PIPELINE
#12 TW
FILL CPL'G W/HOT COAL TAR ENAMEL AFTER CONNECTING WIRE
THERMITE WELD INSIDE OF CPLG.
3" HALF COUPLING WELD TO PIPE
LEAD CONN. DETAIL
NOTE: ELECTRICAL TEST LEAD STATIONS WILL NOT BE REQ'D ON THE CAST IRON PIPE.
ELECTRICAL TEST LEAD STATION DETAIL
N.T.S
HOLD BACK COATING IN SHOP
3/16"
CEMENT GROUT POURED IN FIELD
1/4" φ ROD PLACED IN FIELD
CEMENT MORTAR PLACED IN FIELD
FIELD WELDING DETAIL
CONCRETE CYCLINDER PIPE
N.T.S
EXIST. 1" SERVICE
1"
STA. 10+00 (PIPE LINE 45' WEST OF "P" LINE) SALVAGE EXIST. 12" G.V. & REPLACE WITH 12" FLG. B.V. CONNECT TO EXIST. PIPE W/ FCA. AS.
PROVIDE TEMPORARY THRUST BLOCKING AS NECESSARY TO RETAIN NEW VALVE
STA. 10+00 (PIPELINE 7' EAST OF "P" LINE) 16" F. x HUB 90° BEND
12"
12"
12
B.F.
16
FCA-AS
TEMPORARY BY PASS LINE TO BE INSTALLED BY CITY.
"P" LINE
PROTECT 2" TEMP. BY PASS LINE ON ROAD CROSSINGS.
16"
STA. 10+00
12" 16"
SALVAGE SPOOL
DO NOT REMOVE AUXILIARY VALVE FROM EXIST. LINE.
REMOVE GUARD POST STA 23+21
LEAVE EXIST'G GUARD POST STA 23+21
TRANSFER HYDRANT TO NEW LINE.
PROVIDE NEW GUARD POST SIMILIAR TO OLD AND PAINT BOTH NEW AND OLD GUARD POSTS STA 23+21 SEE DETAIL 1 16/16
3'
PROVIDE SPOOL AS NECESSARY
STA. 10+71 & STA. 23+21
WYNOOSKI STREET
N.T.S
VARIES
10" 5"
SALVAGE SPOOL
LEAVE AUXILIARY VALVE IF ATTACHED TO TEE. IF NOT, REMOVE, SALVAGE, AND ATTACH BLIND FLANGE TO TEE.
MJ
TRANSFER HYDRANT TO NEW PIPELINE
PROVIDE SPOOL AS NECESSARY
STA. 10+76 & STA. 15+05
EVEREST ROAD
N.T.S
1/8" 3/4"
10 GA. x 3/4" BOND BAR
1/16"
WELD PRIOR TO INSTALLING COUPLING
SHOP WELD PRIOR TO COATING PIPE
MIDDLE RING OF MECH. CPLG.
GASKET
5"
PIPE OR SPECIAL FITTING
JOINT BONDING FOR SPECIAL FITTINGS - DETAIL
CONCRETE CYCLINDER PIPE
N.T.S
NOTES:
1. REMOVE PROTECTIVE COATING AS REQ'D. & WIRE BRUSH STEEL AS NECESSARY TO PROVIDE SOUND ELECTRICAL CONTINUITY AT WELDS.
2. COAT ASSEMBLED JOINT BOND BAR W/ HOT COAL TAR ENAMEL.
3. THERMITE WELDING APPROVED IN LIEU OF FIELD WELDING.

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1" = 1'-0" USE 1/2" = 1'-0" OR 1" = 10' USE 1" = 20'

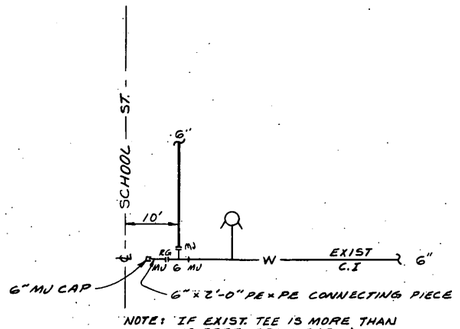
REGISTERED PROFESSIONAL ENGINEER 5946 OREGON JULY 14, 1967 ARCHIE E. MEADOWS

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS
CH2M

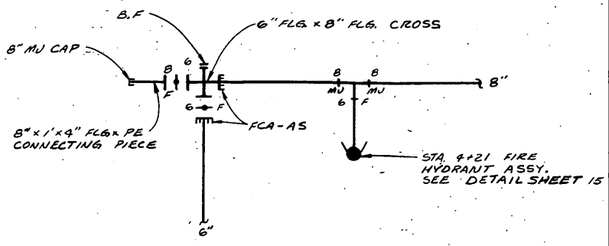
CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS
PIPING DETAILS

CONCRETE CYLINDER PIPING DETAILS

DES ABC KWS	SHEET 16
DR GGS	OF 17
CK AEM	DATE JUNE 1970
EN C5510.1	SCALE AS SHOWN
DWG C 5510-1	

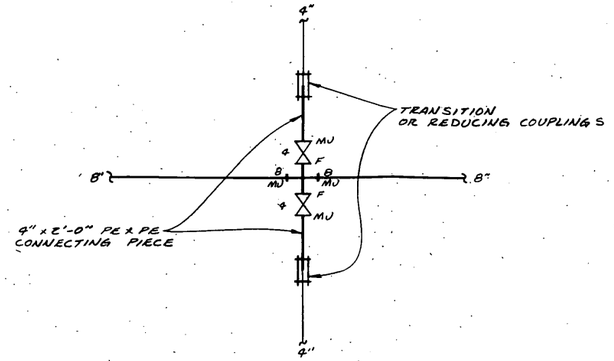


STA. 0+06 E-W

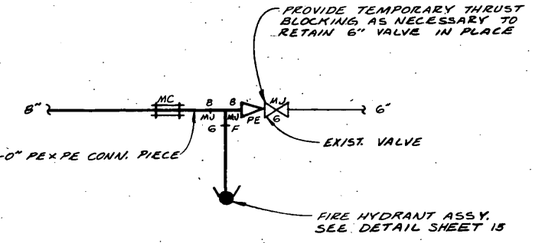


STA. 3+88 N-S

SCHOOL STREET
N.T.S



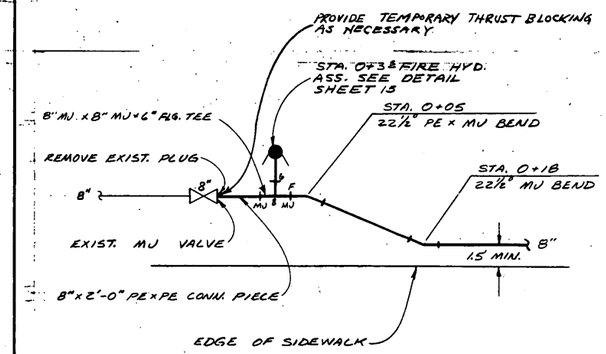
STA. 7+38



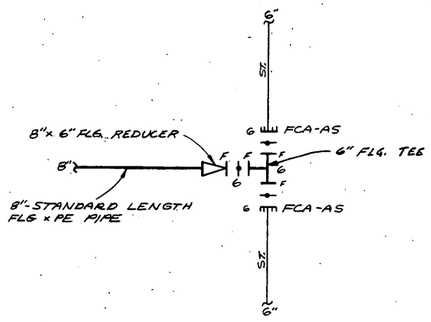
STA. 10+17

5TH STREET
N.T.S

ALL DETAILS

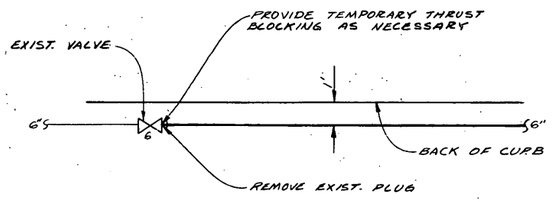


STA. 0+00

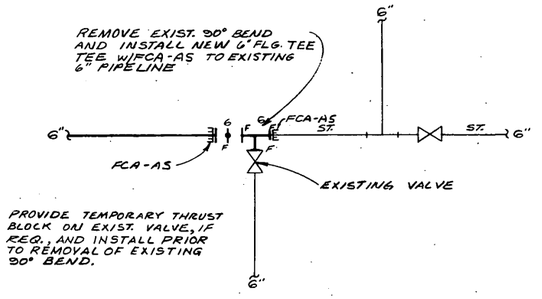


STA. 2+40

SHERMAN STREET
N.T.S



STA. 0+01



STA. 2+40

NORTH STREET
N.T.S

THIS PRINT IS REDUCED TO ONE-HALF OF THE ORIGINAL SCALE
IF THE SCALE READS:
1"=1'-0" USE ½"=1'-0" OR 1"=10' USE 1"=20'

REGISTERED PROFESSIONAL ENGINEER 5960 OREGON JULY 10 1967 ARCHIE E. MEADOWS

CH2M

CORNELL, HOWLAND, HAYES & MERRYFIELD
ENGINEERS PLANNERS ECONOMISTS

CITY OF NEWBERG, OREGON
1970 WATER DISTRIBUTION SYSTEM IMPROVEMENTS

PIPING DETAILS

DES KWS	SHEET 17
DR KAC	
CH GGS	OF 17
CK AEM	DATE JUNE 1970
JOB NO. 5510.1	SCALE AS SHOWN
DWG C 5510-1	