Law & Sons
9300 N.E Halsey St
Portland, Oregon 97220

CITY OF NEWBERG

414 EAST FIRST STREET TELEPHONE 538-9421 NEWBERG, OREGON 97132

CITY OF NEWBERG
CITY RECORDER INDEX NO. 1097

Contract Documents

for

The Construction

of

MESS CREEK SEWER EXTENSION

CRESTVIEW LATERAL

VILLA ROAD to A-DEC INDUSTRIAL PARK

1973?

City of Newberg

Engineering Dept.

ADVERTISEMENT FOR BIDS

Sealed proposals for the construction of Hess Creek Sanitary Sewer, addressed to the Honorable Mayor and City Council, City Hall, City of Newberg, Oregon will be received at the office of the City Finance Officer, until 7:30 P.M., Pacific Daylight Time, August 6, 1973 and then will be publicly opened and read.

Proposals will be received on Hess Creek Sanitary Sewer, Crestview Lateral consisting of approximately 1416 feet of 12 inch concrete sewer line, 1124 feet of 8 inch concrete sewer line, 10 manholes and 1 creek crossing.

Plans and Specifications may be examined at the Office of the City Engineer, City Hall, Newberg, Oregon. A copy of said Documents may be obtained at the Engineer's office at City Hall, Newberg, Oregon upon a deposit of Twenty Five Dollars ($25.00) 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 the City Engineer, City Hall, Newberg, 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 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 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 performance and payment bond for faithful performance of the contract in the full amount of the contract price.

The attention of bidders is directed to the requirements and conditions of employment to be observed and minimum wage rates to be paid under the contract.

The right is reserved to reject any or all proposals, to waive informalities, 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 interest of the City of Newberg.

DATED this 19th day of July, 1973.

CITY OF NEWBERG, OREGON

M. C. Gilbert
Finance Officer

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PROPOSAL

To: Honorable Mayor and City Council
City Hall
Newberg, Oregon

The undersigned, hereinafter called tne 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 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 fifteen (15) calendar days after notification of acceptance, execute the Contract with the Owner in the form of Contract annexed hereto; and will, at tne 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 tne 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, of each schedule for which his Proposal is accepted, within forty-five (45) 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 $50.00 per day 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.

12 INCH MAIN ON HESS CREEK

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
TRENCH EXCAVATION AND BACKFILL					
Class "A"	1386	lin ft	3.50	THREE DOLLARS - FIFTY CENTS	4851.00
Class "B"	30	lin ft	8.40	EIGHT DOLLARS - FORTY CENTS	252.00
PIPE BEDDING					
Class "B"	350	lin ft	1.25	ONE DOLLAR - TWENTY FIVE CENTS	437.50
Class "C"	1046	lin ft	.45	FORTY FIVE CENTS	470.70
COMPACTION OF TRENCH BACKFILL					
Water Settlement	1386	lin ft	.80	EIGHTY CENTS	1108.80
Mechanical Compaction	30	lin ft	2.25	TWO DOLLARS - TWENTY FIVE CENTS	67.50
PIPE 12 inch ASTEM C-14 Extra Strength Concrete PIPE IN PLACE					
	1416	lin ft	3.85	THREE DOLLARS - EIGHTY FIVE CENTS	5451.60
PRECAST CONCRETE MANHOLES (without steps) **Provide 3 water tight covers.**					
	6	each	313.00	THREE HUNDRED THIRTEEN DOLLARS	1878.00
MANHOLE EXTENSIONS					
	11.4	lin ft	30.00	THIRTY DOLLARS	342.00
MANHOLE STUB					
12 inch	1	each	15.00	FIFTEEN DOLLARS	15.00
CREEK CROSSING					
	20	lin ft	10.00	TEN DOLLARS	200.00

CHANNEL CHANGE of HESS CREEK					
	305	lin ft	2.00	Two Dollars	610.00
ASPHALT					
	0.45	ton	100.00	One Hundred Dollars	45.00
BANK PROTECTION					
	50	cubic yd.	6.00	Six Dollars	300.00
				SUB-TOTAL	16 0 x 9 10

8 INCH LATERAL

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
TRENCH EXCAVATION AND BACKFILL					
Class "A"	1124	lin ft	3.50	Three Dollars - Fifty Cents	3934.00
Class "B"	NONE	lin ft			
PIPE BEDDING					
Class "B"	NONE	lin ft			
Class "C"	1124	lin ft	.45	Forty - Five Cents	505.80
COMPACTION OF TRENCH BACKFILL					
Water Settlement	1124	lin ft	.80	Eighty Cents	899.20
Mechanical Compaction	NONE	lin ft			
PIPE 8 inch ASTEM C-14 Extra Strength Concrete PIPE IN PLACE	1124	lin ft	2.80	Two Dollars Eighty Cents	3.147.20
PRECAST CONCRETE MANHOLES (without steps)	4	each	313.00	Three Hundred Thirteen Dollars	1.252.00
MANHOLE EXTENSIONS	33.1	lin ft	30.00	Thirty Dollars	993.00
MANHOLE STUB	NONE	each			
CREEK CROSSING	NONE	lin ft			

8"

CHANNEL CHANGE of HESS CREEK					
	NONE	lin ft			-0-
ASPHALT					
	NONE	ton			-0-
BANK PROTECTION					
	20	cubic yd.	6.00	Six Dollars -	120.00
				SUB-TOTAL	76.88030

TOTAL AMOUNT OF BID 26.880.30

The form of "Compliance Statement" appended hereto shall be executed by the Bidder and submitted as part of this Proposal. Bids received without the signed "Compliance Statement" will be considered as informal.

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 _____

_____ whose address is

_____, _____, _____
Street City State

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

_____ doing business at

_____, _____, _____
Street City 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:

_____ _____

_____ _____

_____ _____

(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 _____ day of _____, 19 _____.

_____
Name of Corporation

By: _____

_____
Title

Attest: _____
Secretary

(See "Compliance Statement" on next page)

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that _____

_____ hereinafter called the Principal, and

_____, a corporation duly organized under

the laws of the State of _____, having its principal place

of business at _____, in the State

of _____, and authorized to do business

in the State of Oregon, as Surety, are held and firmly bound unto the _____

_____ hereinafter called the Obligee in the penal

sum of _____Dollars ($ _____),

for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The condition of this Bond is such that, whereas, the Principal herein is herewith submitting his or its Bid Proposal for _____

_____

said bid Proposal, by reference thereto, being hereby made a part hereof.

NOW, THEREFORE, if the said Bid Proposal submitted by the said Principal be accepted, and the Contract be awarded to said Principal, and if the said Principal shall execute the proposed Contract and shall furnish the Performance Bond as required by the Bidding and Contract Documents within the time fixed by said Documents, then this obligation shall be void, if the Principal shall fail to execute the proposed Contract and furnish the Performance Bond, the Surety hereby agrees to pay to the Obligee the penal sum os liquidated damages.

Signed and sealed this _____ day of _____, 19 ___.

_____
Principal

By _____

_____
Surety

Countersigned:

_____
Resident Agent

By: _____
Attorney-in-fact

(A certified copy of the Agent's power-of-attorney must be attached hereto.)

PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we Wadsworth Plumbing & Heating Co. Inc. d/b/a Law & Sons as Principal, and Industrial Indemnity Company

a corporation, duly authorized to do a general surety business in Oregon, as Surety, are jointly and severally held and bound unto City of Newberg, Oregon

the Obligee herein, in the sum of Sixty Two Thousand, Eight Hundred Eighty & No/100ths (Dollars) ($62,880.00), 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, Wadsworth Plumbing & Heating Co. Inc. d/b/a. Law & Sons
Contractor

the Principal herein, on the 14 day of August, 1973, 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 State Industrial Accident Commission, 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 Industrial Accident 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 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 State Industrial Accident Commission 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 duplicate, this 14 day of August, 19 73.

Wadsworth Plumbing (SEAL)
& Heating Co. Inc. d/b/a. (SEAL)
Law & Sons. (SEAL)
(SEAL)
(SEAL)
Principal

Witnesses:

Industrial Indemnity Company (SEAL)
By Kathleen Brophy (SEAL)
Kathleen Brophy (SEAL)
Surety
Attorney-in-Fact
720 S.W. Washington
Portland, Oregon

Countersigned:

By: _____
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.

Power of Attorney 278

INDUSTRIAL INDEMNITY COMPANY

HOME OFFICE SAN FRANCISCO

Know all men by these Presents:

That INDUSTRIAL INDEMNITY COMPANY, a corporation organized and existing under the laws of the State of California, and having its principal office in the City of San Francisco, State of California, does hereby make, constitute and appoint

----------KATHLEEN BROPHY----------

its true and lawful attorney for it and in its name, place and stead to execute on its behalf as surety, bonds, undertakings, stipulations, consents and all contracts of suretyship and to attach its corporate seal to such obligations in favor of

----------ALL OBLIGEES----------

provided that the liability of the Company as surety under his authority, in no one instance shall exceed the sum of

----------UNLIMITED----------

thousand dollars, and reserving to itself full power of substitution and revocation.

This Power of Attorney is made and executed in accordance with the Resolution adopted by the Board of Directors of INDUSTRIAL INDEMNITY COMPANY at a meeting held on the 27th day of January, 1971, reading as follows:

"RESOLVED, that the Chairman of the Board or President or Executive Vice President or Senior Vice President of this company, when attested to by the Secretary or an Assistant Secretary of this company, be and he hereby is authorized to execute Powers of Attorney qualifying the attorneys selected to act under such Powers of Attorney to execute on behalf of Industrial Indemnity Company bonds, undertakings, stipulations, consents and all contracts of suretyship, and to attach the corporate seal thereto."

In witness whereof, INDUSTRIAL INDEMNITY COMPANY has caused these presents to be signed and its Corporate Seal to be affixed by its proper officers, at the City of San Francisco, California, this 6TH day of JULY , 19 72 .

INDUSTRIAL INDEMNITY COMPANY

By D. H. McCOMBER

D. H. McCOMBER, EXECUTIVE VICE PRESIDENT

SEAL

Attest:

DONALD W. SATTERLEE

DONALD W. SATTERLEE, ASSISTANT Secretary

STATE OF CALIFORNIA
CITY AND COUNTY OF SAN FRANCISCO } ss.

On this 6TH day of JULY , 19 72 , before me, MARY MUELLER , a notary public in and for the City and County of San Francisco, State of California, personally appeared D. H. McCOMBER and DONALD W. SATTERLEE known to me to be the EXECUTIVE VICE PRESIDENT and ASSISTANT Secretary of the corporation which executed the within instrument, and acknowledged to me that such corporation executed the same, and that the resolution referred to in the preceding instrument is a true and correct copy of the resolution duly passed at a meeting of the Board of Directors on January 27, 1971, and that the same is in full force and effect.

In witness whereof, I have hereto set my hand and affixed my official seal the day and year in this certificate first above written.

SEAL

MARY MUELLER

Notary Public in and for the City and County of San Francisco, State of California

My commission expires JULY 14, 1975

I, W. H. EAGLETON, ASSISTANT VICE PRESIDENT of INDUSTRIAL INDEMNITY COMPANY, do hereby certify that I have compared the Power of Attorney granted herein and the Resolution recited herein with the originals now on file in the principal office of said Company, and that the same are correct transcripts therefrom and of the whole of the said original, and that said Power of Attorney has not been revoked but is still in full force and effect.

In witness whereof, I have hereunto subscribed my name as such officer and affixed the seal of INDUSTRIAL INDEMNITY COMPANY at the City of San Francisco, California, this 4th day of AUGUST , 19 73

INDUSTRIAL INDEMNITY COMPANY INCORPORATED NOV. 14, 1920 SAN FRANCISCO, CALIFORNIA

SEAL

W. H. EAGLETON, ASSISTANT VICE PRESIDENT

1Y041 R6 (2/71)
FORM 1Y040

RIDER

In consideration of the premium charged, it is understood and agreed that:

Effective from the 14th. day of August , 19 73

THE CONTRACT PRICE STATED IN THE PERFORMANCE & PAYMENT BOND TO THE CITY OF NEWBERG AS OBLIGEE SHALL BE CHANGED:

FROM: SIXTY TWO THOUSAND EIGHT HUNDRED EIGHTY AND NO/100THS. DOLLARS ($62,880.00)

TO: TWENTY SIX THOUSAND EIGHT HUNDRED EIGHTY AND NO/100THS. DOLLARS ($26,880.00)

Provided, however, that the liability of the Surety under the attached bond and under the attached bond as changed by this rider shall not be cumulative.

Nothing herein contained shall be held to vary, waive, alter or extend any of the terms, conditions, agreements or warranties of the undermentioned bond, other than as stated above.

Attached to and forming a part of Bond No. YS697-2466 issued by the Surety dated the 14th. day of August , 19 73 , on behalf of WADSWORTH PLUMBING & HEATING CO., INC. D.B.A. LAW & SONS

and in favor of CITY OF NEWBERG, NEWBERG, OREGON

signed this 25th. day of September , 19 73.

INDUSTRIAL INDEMNITY COMPANY

By Kathleen Brophy
Kathleen Brophy Attorney-in-fact

THE ABOVE IS HEREBY AGREED TO:

WADSWORTH PLUMBING & HEATING CO., INC.
D.B.A. LAW & SONS
Name of Principal

By James Law

1Y087 R1 (9/72)

CONTRACT FOR CONSTRUCTION

THIS CONTRACT, made and entered into this 14TH day of AUGUST, 1973, by and between the City of Newberg, Oregon, a municipal corporation, hereinafter called the "Owner", and WADSWORTH PLUMBING & HEATING CO. INC DBA LAND & SONS of 9300 NE HALSEY ST. PORTLAND OREGON 97220 hereinafter called the "Contractor."

WITNESSETH:

Said Contractor, in consideration of the sum of 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 the construction of HESS CREEK SEWER EXTENSION - CRESTVIEW LATERAL _____, 19 _____, 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 6 day of August, 1973, 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 2 sheets entitled "City of Newberg,

dated , 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 on the Proposal, shall be the 78TH day of SEPT, 1973. 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 ($50.00) FIFTY DOLLARS 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 14TH day of August, 1973.

CITY OF NEWBERG, OREGON

By: _____

Title: _____

By: _____

Title: _____

_____
Contractor

LAW & SONS

By: _____

Title: PRESIDENT

Approved as to form:

_____
City Attorney

DIVISION I - GENERAL PROVISIONS

Section 1 - Definitions and Terms

Terms used or referred to herein are defined as follows:

1.01 BIDDER
Any individual, firm, partnership, corporation or combination thereof, acting directly or through a duly authorized representative, submitting a proposal on the work contemplated.

1.02 CHANGE ORDER
A written instruction to the Contractor, signed by the Engineer, prescribing any change in the work.

1.03 CONTRACTING AGENCY
The agency which has contracted for the performance of the work or for whom the work is being performed.

1.04 CONTRACT
The written agreement covering performance of the work including the formal contract, advertisement for bids, instructions to bidders, proposal with required affidavit, specifications, bond and plans.

1.05 CONTRACTOR
The individual, partnership, corporation, or other entity entering into a contract with the Contracting Agency to perform the contemplated work. In the case of work being done under a permit issued by the Contracting Agency, the Permittee shall be construed to be the Contractor.

1.06 ENGINEER
The Engineer of the Contracting Agency, acting either directly or through his authorized representatives, and designated by the Contracting Agency to supervise the work during its execution.

1.07 HOUSE CONNECTION SEWER
Any sewer pipe line lying within an easement, public street or right of way which connects, or is proposed to connect a house sewer or any lot or part of a lot with a public sewer.

1.08 HOUSE SEWER
Any sewer pipe line which connects, or is proposed to connect, any building to a house connection sewer.

1.09 INSPECTOR
An authorized representative of the Engineer of the Contracting Agency, limited to the particular duties entrusted by the Engineer.

1.10 LABORATORY
A materials testing laboratory operated by a public agency or if approved by the Engineer, any private, commercial testing laboratory.

1.11 LINEAL FOOT
Horizontal measurement as determined by engineers' station.

1.12 MAJOR ITEM
Any item or work and/or materials having an original contract value in excess of $500.00 or which exceeds ten (10) percent of the amount of the original contract, whichever is greater.

1.13 NOTICE TO PROCEED
A written notice to the Contractor from the Contracting Agency, designating the date by which the Contractor shall begin prosecution of the work.

1.14 PERSON
Any individual, firm, association, partnership, corporation, trust or joint venture.

1.15 PLANS
The plans, profiles, cross sections and drawings, or reproductions thereof, approved by the Engineer, which show the details of the work to be done.

1.16 PROPOSAL
The offer of the bidder when submitted on the proposal form, properly signed and guaranteed.

1.17 PROPOSAL GUARANTY
Certified check or bidder's surety bond executed by a bonafide surety company, accompanying the proposal as a guarantee that the bidder will enter into a contract with the Board for the performance of the work.

1.18 REFERENCE SPECIFICATIONS
Bulletins, standards, rules, methods or analysis or test, codes and specifications of other agencies, engineering societies, or industrial associations referred to in these specifications. All such references specified herein, refer to the latest edition thereof, including any amendments thereto which are in effect and published at the time of advertising for bids or issuing the permit for the project.

1.19 ROADWAY
That portion of the right of way or easement intended for use by vehicular traffic.

1.20 SANITARY SEWER
A sewer that carries liquid and water-carried wastes together with minor quantities of storm, surface and groundwaters that are not admitted intentionally.

1.21 SEALER OF WEIGHTS AND MEASURES
The Sealer of Weights and Measures of the State of Oregon, as defined by ORS 618.080 and ORS 618.090.

1.22 SEWER
A pipe or conduit that carries wastewater or drainage water.

1.23 SPECIAL PROVISIONS
Specific clauses setting forth conditions or requirements peculiar to the work which modify or supplement that standard specifications.

1.24 SPECIFICATIONS
This term includes the standard specifications and specifications included herein by reference, any special or project specifications and specifications included therein by reference, specifications on the plans referred to and specifications contained or referred to in supplemental agreements between the Contractor and the Contracting Agency.

1.25 STANDARD DRAWINGS
Drawings of structures or devices referred to on the plans or in specifications by title and/or an index number.

1.26 STATE
The State of Oregon.

1.27 STORM SEWER
A sewer that carries storm water and surface water, street wash and other wash waters, or drainage, but excludes domestic wastewater and industrial wastes. Also called storm drain.

1.28 STREET
Any road, highway, parkway, freeway, alley, walk or way.

1.29 SURETY
The bondsman, party or parties who may guarantee the fulfillment of the contract by bond.

1.30 UTILITY
Tracks, overhead or underground wires, pipe lines, conduits, ducts or structures owned, operated or maintained in or across a public right of way or private easement.

1.31 WORK
That which is proposed to be constructed or done under the contract.

1.32 ABBREVIATIONS AND SYMBOLS

A.A.S.H.O. (AASHO), American Association of State Highway Officials; A.G.C. (AGC), Associated General Contractors of America; A.P.W.A. (APWA), American Public Works Association; A.S.T.M. (ASTM), American Society for Testing Materials; A.W.W.A. (AWWA), American Water Works Association; O.R.S. (ORS), Oregon Revised Statutes.

Section 2 - Proposal Requirements And Conditions

2.01 INTERPRETATION OF PLANS AND SPECIFICATIONS

The Engineer will interpret the meaning of any part of the plans and specifications about which any misunderstanding may arise, and his decision will be final.

Should the Contractor become aware of any error or discrepancy in or between the plans and specifications, he shall refer the matter to the Engineer for adjustment before proceeding further with the work. Should the Contractor proceed with the work without referring the matter, he does so on his own responsibility.

2.02 FIELD CONDITIONS

Logs of test holes, ground water levels, and any accompanying soil reports as furnished by the Contracting Agency are furnished for general information only. The field conditions so set forth shall not constitute a representation or warranty, expressed or implied, that such conditions are actually existent. Bidders shall make their own investigations and form their own estimates of the site conditions. The Contracting Agency will not be liable for any loss sustained by the Contractor as a result of any variance between conditions as set forth in the soil reports or shown by the logs of test holes and the actual conditions revealed during the progress of the work or otherwise.

2.03 CONTRACT DOCUMENTS

The Contract Documents under which it is proposed to execute this 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 Contracting Agency will not be responsible for any other explanation or interpretations of said Documents.

2.04 TYPE OF PROPOSAL

The Proposal for the work contemplated is to be submitted on the form prescribed in the Proposal.

2.05 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 or in the items mentioned herein. Written amounts shall govern in cases of discrepancy between the amounts stated in writing and the amounts stated in figures. In the case of error in extending unit prices in the proposal, the correct extension of the unit prices shall govern.

Any proposal shall be deemed informal which contains omissions, erasures, alterations or additions of any kind, or items uncalled for, or in which any of the items 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 prescribed officers thereof; if made by a partnership, by one of the partners.

2.06 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 and submitted with the Contract Documents.

2.07 WITHDRAWAL OF PROPOSAL

Any proposal may be withdrawn prior to the scheduled time for the opening of proposals either by telegraph or written request, or in person. No proposal may be withdrawn after the time scheduled for opening of proposals unless the time specified in Section 3.01 has elapsed.

2.08 BID SECURITY

Proposals must be accompanied by a certified 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 or 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.

The Contracting Agency reserves the right to retain the bid securty of the three lowerst 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.

2.09 CONDITIONS OF WORK

Each bidder must inform himself of the conditions relating to the regular execution of the work, and it is assumed that he will respect 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 of 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, right-of-way, and acess to the work, fire protection regulations, and similar requirements.

2.10 PREQUALIFICATION OF BIDDERS

Bidders must be prequalified in conformance with ORS 279.008, acts amendatory thereto, and the regulations of the Contracting Agency at least 10 days prior to the bid opening date in order for the prospective Bidder to retain his right to appeal should he be disqualified by public officer representing the Contracting Agency. If the prequalification form is submitted less than five (5) days prior to the bid opening date, the right of appeal is lost.

Prequalification forms shall not be submitted with the bid.

Section 31 - Award and Execution of Contract

3.01 AWARD OF CONTRACT

After the proposals for the contemplated work have been opened and read as provided in these specifications, the respective totals thereof will be checked and compared by the Contracting Agency; and the results thereupon will be considered public information.

Unless otherwise stated in the Special Provisions or in the Advertisement for Bids the contract will be awarded within the thirty (30) days after the opening of proposals to the lowest bidder meeting the qualifications required by law, including but not limited to the law relating to prequalification of bidders, and the requirements stated in the advertisement for bids, the instructions to bidders, and/or the specifications, and whose proposal complies with all the prescribed requirements unless all proposals are rejected. The Contracting Agency reserves the right to reject any and all proposals and no proposal shall be considered as being binding upon the Contracting Agency until the execution of the contract; and failure of the awardee to properly execute the awarded contract and furnish acceptable bonds and insurance as provided herein, shall be just and sufficient cause for the annulment of the award and the forfeiture of his proposal guaranty.

3.02 EXECUTION OF CONTRACT

The contract shall be signed by the successful bidder and returned, together with the contract bonds and required insurance documents within 10 calendar days after the award of the contract unless otherwise stated in the Special Provisions or in the Advertisement for Bids, and after receipt of same by the Contracting Agency the proposal guarantees will be returned to all bidders. The Contractor shall carry all insurance which may be required by Federal and State laws by local ordinances, and by these specifications. The attention of the Contractor is called to the fact that, when the United States Government participates in all or any portion of the cost of the work, the Federal laws authorizing such participation and the rules and regulations made pursuant to such laws must be observed by the Contractor. The work shall be subject to the inspection and approval of the authorized representatives of such Federal agencies as are created for the administration of these laws.

3.03 CONTRACT BONDS

Prior to the execution of the contract, the Contractor shall file with the Contracting Agency a Performance Bond in the amount and for the purposes noted below, duly executed by a responsible corporate surety authorized to issue such bonds in the State of Oregon, which bond must in all respects comply with ORS 279.502 to ORS 279.540, inclusive, and be satisfactory and acceptable to the Contracting Agency and he shall pay all premiums and costs thereof and incidental thereto to keep such bond in full force until one year after acceptance of the work in writing by the Contracting Agency.

The bond must be signed by both the Contractor and surety and shall be in the sum of not less than 100% of the contract price to assure the claims of material men supplying materials to him, and of mechanics and laborers employed by him on the work required under these specifications.

Provided the Contractor shall faithfully and truly observe and comply with the terms, conditions and provisions of the contract, in all respects, and shall well and truly and fully do and perform all matters and things by him undertaken to be performed under said contract, upon the terms set forth therein, and within the time prescribed therein, or as extended as provided in the applicable Standard Specifications, and shall indemnify and save harmless the Contracting Agency, its officers, employees, and agents, against any direct or indirect damages of every kind and description that shall be suffered or claimed to be suffered in connection with or arising out of the performance of the said contract by the said Contractor or his subcontractors; and shall make payment promptly, as due, to all subcontractors and to all persons supplying to the Contractor or his subcontractors equipment, supplies, labor or materials for the prosecution of the work, or any part thereof, provided for in said contract, and shall pay all contributions or amounts due the State Industrial

Accident Fund and the State Unemployment Compensation Trust Fund from such Contractor or subcontractors incurred in the performance of said contract, and pay all sums of money withheld from the Contractor's employees and payable to the State Tax Commission; and shall pay all other just debts, dues and demands incurred in the performance of the said contract and shall pay the Contracting Agency such damages as may accrue under said contract and shall in all respects perform said contract according to law, then this obligation is to be void, otherwise to remain in full force and effect.

Nonpayment of the bond premium will not invalidate this bond nor shall the Contracting Agency be obligated for the payment thereof.

Should any surety or sureties upon said bonds or any of them become insufficient, said Contractor shall renew said bond or bonds with good and sufficient sureties within ten (10) days after receiving notice from the Contracting Agency that the surety or sureties are insufficient.

3.04 PROTECTIVE LIABILITY INSURANCE REQUIREMENTS

The contractor shall furnish to the Contracting Agency in t riplicate, a policy or certificate of protective liability insurance in which the Contracting Agency shall be named insured or be named in such insurance as an additional insured with the Contractor. In compliancd with this provision, the Contractor may file with the Contracting Agency a satisfactory "blanket coverage" policy or certificate of insurance. The policy shall insure the Contracting Agency, its officers, employees and agents against all claims arising out of or in connection with the work to be performed and shall remain in full force and effective until the work is accepted by the Contracting Agency. The policy shall provide the following minimum limits.

Bodily Injury..... $100,000 each person
$300,000 each occurrence

Property Damage.... $50,000 each accident

Such policy shall provide coverage at least as broad as that provided in the Standard Form approved by the National Bureau of Casualty Underwriters together with such endorsements as are required to cover the risks involved. In addition the Contractor shall furnish evidence of a commitment by the insurance company to notify the Contracting Agency of the expiration or cancellation of the insurance policies.

The cost of this insurance shall be understood to be included in the prices bid for the various items of work and no additional compensation will be made therefor.

3.05 CONTRACTING AGENCY"S IMMUNITY FROM LIABILITY

The Contractor shall save, keep and hold harmless, the Contracting Agency and all officers and agents thereof from all damages, costs or expenses in law or equity that may at any time arise or be set up because of damages to property or of personal injury received by reason of or in the course of performing said work, which may be occasioned by any negligent act or omission to act which amounts to negligence upon the part of the Contractor or any of said Contractor's employees, or any subcontractor performing any or the work contemplated by the contract.

The Contracting Agency shall not be liable or responsible for any accident loss or damage happening to the works referred to in the contract prior to the completion and acceptance thereof.

3.06 INDUSTRIAL ACCIDENT INSURANCE

The Contractor shall secure, maintain in full force and effect and bear the cost of complete Industrial Accident Insurance in accordance with the requirements of the Workmen's Compensation Laws of the State of Oregon for all persons employed on the work, for the duration of the contract and shall furnish to the Contracting Agency, prior to the execution of the contract a Certificate of Insurance which meets the requirements of said Workmen's Compensation Laws. The Contracting Agency, its officers, employees, or agents will not be responsible for any claims or suits in law or equity occasioned by the failure of the Contractor to comply with the provisions of this paragraph.

Section 4 - Scope of Work

4.01 INTENT OF CONTRACT

The intent of the contract is to prescribe a complete work or improvement which the Contractor undertakes to do, in full compliance with the provisions and requirements of the contract. The Contractor for all or any part shall furnish all labor, materials, tools, equipment, transportation, necessary supplies and incidentals required to make each and every item complete as contemplated by the contract. Any deviation from these requirements must be stipulated in the special provisions.

4.02 PLANS, SPECIFICATIONS AND WORK

The plans, together with specifications and other contract documents will govern the work to be done. Anything mentioned in the specifications and not shown on the plans and detailed drawings, or shown on the plans and detailed drawings and not mentioned in the specifications, shall be of like effect as though shown or mentioned in both.

Specifications and plans referred to in any of the contract documents shall be considered as being included in the document in which such reference is made. A reference to a particular specification or standard drawing in a contract document shall

exclude any earlier or later modification thereof. When a particular standard or specification is referred to, such reference shall be to the standard or specification including officially adopted revisions or amendments thereto which is in force at the time of advertising for bids.

In case of conflict, the order of precedence of the following documents in controlling the work shall be:

(1) Permits from outside agencies required by law
(2) Special Provisions
(3) Plans
(4) Standard Drawings
(5) Standard Specifications

Change Orders, supplemental agreements and approved revisions to plans and specifications will take precedence over contract documents listed above.

4.03 PLANS AND SHOP DRAWINGS

The plans furnished and included with the specifications will show such details as may be necessary to comprehensively indicate the work that is proposed and the results that are intended to be accomplished. Any additional working drawings, detail plans, or shop drawings that may be required in connection with the prosecution or construction of any part of such work shall be supplied by and at the expense of the Contractor as they will not be accepted by the Engineer from suppliers or others.

When shop drawings are required in the various sections of the specifications or are requested by the Engineer, they shall be prepared in accordance with modern engineering practice. Unless otherwise specified, shop drawings shall be submitted in quadruplicate to the office of the Engineer for approval or correction not less than 30 days before approved drawings will be required. One set will be returned to Contractor marked"approved" or "approved as corrected". If changes are required, four copies of corrected shop drawings shall be delivered to the Engineer.

Shop drawings shall be of sufficient size and scale to clearly show all details.

No materials shall be furnished or work done on items requiring shop drawings prior to approval. Approval or shop drawings shall not relieve the Contractor from responsibility for deviations from the contract documents unless the deviation was specifically called to the attention of the Engineer, nor from responsibility for errors or omissions of any sort in the shop drawings.

The Contractor shall keep a copy of the plans and specifications at the job site and access thereto shall at all times be accorded the Engineer.

4.04 CHANGES AT THE CONTRACTOR"S REQUEST

Provision has been made in the specifications for certain specific changes in methods of construction which may be made at the Contractor's request and upon approval of the Engineer. Changes in the drawings and specifications, other than those specified herein, which do not materially affect the work, and which are not detrimental to the work or to the interests of the Contracting Agency as determined by the Engineer, may be granted to facilitate the work of the Contractor when such changes are requested in writing and submitted to the Engineer for approval. In the event such changes are granted, the changes shall be made without additional cost to the Contracting Agency, and the Contracting Agency reserves the right to receive an equitable adjustment in the contract price or contract time as a consideration for authorizing any such change.

4.05 ALTERATION OF QUANTITIES AND EXTRA WORK

The Contracting Agency reserves the right to make such increase or decrease in the quantity of any item of work or material to be performed or furnished under such contract, or to order the performance of such additional or extra work of a class not contemplated by the proposal, as may be considered expedient or advantageous and essential to the satisfactory completion of the proposed work and the full accomplishment of the intended purpose thereof, without thereby affecting the validity of the contract or contract bonds, and without giving notice to the surety on any such bond, unless the total bid price is increased more than 25%. In such cases the Contractor will be requied to perform or furnish additional quantities or extra items of work or materials, or to decrease the amount of work or materials to be performed or furnished under the contract or to omit portions thereof, and to furnish and provide the necessary labor and equipment to do so, when and as the Engineer may so order in writing within the limitations herein or by law provided. In the event that any such increase or decrease in the quantity of work or materials to be performed or furnished is so ordered, the amount to be paid the Contractor under his contract shall be correspondingly increased or decreased as the case may be, in proportion to the increased or decreased quantities or work or materials performed or furnished under such order.

4.06 ALTERATION OF QUANTITIES

In the event that the Contractor is directed by the Engineer to increase, decrease or omit portions of the work, and the total pay quantity for any item of work varies from the original contract quantity by 25 percent or less, payment will be made for the quantity of work performed at the contract unit price therefor.

If the total pay quantity for any item of work required under the contract varies from the original contract quantity by more than 25 percent, the compensation to the Contractor will be determined as follows:

If a change is made which, together with any previous changes in quantity, increases the quantity of any major item or decreases the quantity of any item more than 25 percent of the original contract quantity, the payment for the work in excess of the 25 percent increase over the original contract amount of that item will be determined by negotiation; at the option of the Engineer, payment for such excess will be made on the basis of "Extra Work" as hereinafter provided. Credit for decreases in the quantity of any item may be determined by negotiation but in no event shall the amount of credit exceed the contract unit prices for the omitted items.

4.07 EXTRA WORK

Any new and unforeseen work will be classes as "Extra Work" when determined by the Engineer that said work is not covered by any of the contract items for which there is a bid price, or by a combination of such items.

Changes in the work involving either additional costs or credits for unforeseen additions or omissions in the work shall be made only subsequent to execution of a Change Order by the Engineer or by Supplemental Agreement issued by the Contracting Agency.

Payment for extra work on a lump sum or Unit Price basis required to be performed in accordance with the provisions of this section will be established by mutual agreement between the Contractor and the Engineer within the legal limits provided by State laws or local ordinances. When no mutual agreement can be reached, payment will be made on a force account basis as hereinafter prescribed.

When the extra work is to be performed on a force accound basis, the Contractor shall keep full and complete records of the cost of such work and shall permit the Engineer to have access thereto as may be necessary to assist in the determination of the compensation payable for such work. An itemized statement of such extra work shall be submitted to the Engineer for approval prior to submitting invoice for payment. The Contractor will be paid for labor, materials and equipment rental as hereinafter prescribed.

Only materials incorporated in the work will be paid for.

To the totals computed as hereinafter prescribed for labor, materials, and equipment rental will be added 10% for overhead, profit and supervision. It is understood that labor, materials and equipment may be furnished by the Contractor or the subcontractor or by others on behalf of the Contractor. However, when extra work to be paid for on a force account basis is performed by forces other than those of the Contractor, the Contractor shall reach agreement with such other forces as to the distribution of the payment to be made by the Contracting Agency for such work and no additional payment will be made therefor.

4.07A LABOR

The cost of all labor used in performing the work under this contract shall be based on the prevailing wage scale as may be set forth in the Special Provisions for each particular craft or type of workman involved. Employer payments for payroll taxes and insurances, health and welfare, pension, vacation, and other similar purposes shall be included in this cost.

4.07B MATERIALS

The cost of materials incorporated in the work will be the cost to the purchaser, whether contractor, subcontractor or other forces, from the supplier thereof, except as follows:

a. If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer. No markup except for actual costs incurred in the handling of such materials will be permitted.

b. If the materials are obtained from a supplier or source owned wholly or in part by the purchaser, payment therefor will not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current price of such materials delivered to the job site, whichever price is lower.

c. The Contracting Agency reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and profit on such furnished materials.

4.07C EQUIPMENT RENTAL

The Contractor will be paid for the use of equipment on the basis of, but not exceeding the prevailing hourly rental rates established by the Oregon State Highway Department and recognized by the Associated General Contractors for the area where such equipment is required to be operated.

On any equipment for which no rental rate has been established by the Oregon State Highway Department, or where the required operation of the equipment is less than four hours or in excess of one week, rental rates shall be proposed by the Contractor and agreed upon in writing by the Engineer prior to the start of fource account work.

Equipment that is in operational condition and is standing by with the Engineer's approval for participation in fource account work will be paid for at 50 percent of the agreed upon rental rate.

Rental time will not be allowed while equipment is inoperative due to breakdowns for periods in excess of 30 minutes. Rental time shall be computed in ½-hour increments. In computing rental time of equipment in actual operation, less than 30 minutes will be considered ½hour.

The rental rates paid, as above provided, shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance and all incidentals. Operators of rented equipment will be paid for as provided under Section 4.08.

All equipment shall, in the opinion of the Engineer be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools having a replacement value of $50.00 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

a. Equipment on the Work - The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed and, in addition, shall include the time required to move the equipment to the locationof the extra work and return it to the original location except that moving time will not be paid for if the equipment is used at the site of the extra work on other than such extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than such extra work.

b. Equipment Not on the Work - For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid rental rates as agreed to, as provided in section 4.10 above, and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions.

(1) The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.

(2) The Contracting Agency will pay the costs of loading and unloading such equipment.

(3) The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers or the applicable minimum established rates of the Oregon Public Utility Commission.

(4) The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Dundays and legal holidays unless the extra work is performed on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. The maximum rental time to be paid per day will not exceed 8 hours unless the equipment is in operation for a longer time.

(5) Should the Contractor desire the return of the equipment to a location other than its original location, the Contracting Agency will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the work.

(6) Payment for transporting, loading and unloading equipment as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

4.07D RECORDS

The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct cost of extra work paid for on the force account basis and the costs of other operations performed in connection with the contract.

The Contractor shall furnish to the Engineer daily reports in duplicate of the extra work to be paid for on a force account basis. The reports shall itemize the materials used and shall set forth the direct cost of labor and the charges for equipment rental whether furnished by the Contractor, or subcontractor. The reports shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked together with the size, type and identification number of equipment and hours of equipment operation.

Material charges shall be substantiated by vendors' invoices. Such invoices shall be submitted with the reports; or, if not available, they shall be submitted with subsequent reports. In the event said vendors' invoices are not submitted within 15 days after acceptance of the work, the Contracting Agency reserves the right to establish the cost of such materials at the lowest current price at which said materials are available in the quantities concerned delivered to the location of the work.

All reports shall be signed by the Contractor or his authorized representative.

The Engineer will compare his records with the reports furnished by the Contractor, make any necessary adjustments and then compile the costs of extra work paid for on a force account basis

on forms furnished by the Contracting Agency. When these extra work reports are agreed upon and signed by both parties, they shall become the basis of payment for the work performed.

4.08 CLEANUP AND DUST CONTROL

Throughout the period of construction, the Contractor shall keep the site free and clean from all rubbish and debris and shall promptly clean up all or any portion of the site when notified to do so by the Engineer. Care shall be taken to prevent spillage on the streets over which hauling is done, and any such spillage or debris deposited on streets due to the Contractor's operations shall immediately be cleaned up. The Contractor shall promptly remove from any parts of the working area all unused materials, surplus earth, and debris. Construction areas shall be left in a clean, neat and acceptable condition at the earliest time following completion of that portion of the work.

In the event that the Contractor fails to comply with the orders of the Engineer regarding cleanup the Engineer may require the Contractor to cease progress on any or all parts of the work under contract until the unsatisfactory condition is corrected. The Engineer may order such cleanup work performed by others and and the costs therefor deducted from payments due the Contractor. No additional compensation will be allowed as a result of such suspension.

During all phases of the construction work, the Contractor shall take precautions to abate dust nuisance by cleaning up, sweeping, sprinkling with water, or other means as necessary to accomplish results satisfactory to the Engineer.

Upon completion of the work and prior to final inspection the entire site of operations shall be cleared of equipment, unused materials, and rubbish, so as to present a clean and neat appearance. All costs of"Cleanup" including all charges for water, are to be absorbed in the prices bid for the various bid items.

4.09 VERMIN CONTROL

At the time of occupancy by the Contracting Agency, any structure or structures entirely constructed under the contract shall be free of rodents, insects, vermin or pests. Extermination work as may be necessary shall be arranged and paid for by the Contractor as part of the contract work within the contract time and shall be performed by a licensed agency and in accordance with the requirements of governing authorities. The Contractor shall be responsible for any injury to persons or property resulting from extermination work and for the elimination of any offensive odors resulting from extermination operations.

4.10 SANITARY PROVISIONS

The Contractor shall provide, and maintain in a neat and sanitary condition, such accommodations for the use of his employees as may be necessary to comply with all applicable laws, ordinances and regulations.

In the event of damage to the existing sewer facilities, or interruptions of existing sewage flows, the Contractor shall promptly dispose of any free sewage by pumping or other means. Sewage shall not be permitted to flow in the trenches or be covered by backfill. Continuous sanitary sewer service in closed conduits shall be maintained at all times.

Section 5 - Control of Work

5.01 SUPERVISION AND INSPECTION

The Engineer shall decide within the provisions of the specifications all questions which may arise concerning the quality or acceptance of materials furnished and work performed, and all questions concerning the acceptable fulfillment of the contract by the Contractor.

The Engineer or his representative shall have access to the work at all times. The Contractor shall furnish all facilities for inspection at the construction site, and at shops or yards, and shall not cover up amy work requiring inspection until the same has been approved by the Engineer. If work should be covered up before being inspected, the Contractor will be required to remove such portions of the work as may be necessary to disclose the part in question.

The Contractor shall notify the Engineer 24 hours prior to commencing any work, or resuming work after shutdowns, except for normal resumption of work following Saturdays, Sundays, or holidays.

The Contractor shall be fully responsible for providing proper supervision and sufficient labor and equipment to accomplish the work and to complete the work within the contract time.

The Contractor shall maintain a local telephone for the duration of the contract, at his own expense, where he or his authorized representative may be reached directly or by message at all times; during and outside of working hours.

5.02 COOPERATION WITH OTHERS

Ordinarily, utility owners and Contracting Agency responsible for facilities located within the right of way will be required to complete any installation, relocation, repair, or replacement prior to the commencement of work by the Contractor. However, when this is not feasible or practicable or the need for such work was not foreseen, such utility owners or Contracting Agency shall have the right to enter upon the right of way and upon any structure therein for the purpose of making new installations, changes or repair, and the Contractor shall so conduct his operations as to provide the time needed for such work to be accomplished during the progress of the improvement.

Where two or more contractors are employed on related or adjacent work, each shall conduct his operations in such a manner as not to cause any unnecessary delay or hindrance to the other.

5.03 MUTUAL RESPONSIBILITY OF CONTRACTORS

The Contracting Agency may let other contracts on any portion of the site for any work not included in the contract.

The Contractor shall perform the work of the contract so that it will properly coordinate with and fit the work performed by other contractors. He shall give the other contractors every reasonable opportunity to perform their work, store materials, and place equipment therefor, and fit their work to the work of other contractors. He shall furnish to the other contractors all information necessary in order that they may properly connect and fit their work to his and in ample time, so that they may have reasonable opportunity to prepare their work accordingly. He shall make the work of the contract ready to receive the work of the other contractors at the time fixed therefor, and shall fit this work to that of the other contractors at the times fixed therefor.

5.04 UTILITIES

Utilites for the purposes of these specifications shall be considered as including but not limited to: pipe lines, conduits, transmission lines, and appurtenances of Public Utilities and those of private industry, businesses or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewers, irrigation facilities, street lighting, traffic signal, telephone, television, and fire alarm systems.

The Contracting Agency has by a search of known records, endeavored to locate and indicate on the drawings, all utilities which exist within the limits of the work. However, the accuracy or completeness of the utilities indicated on the drawings is not guaranteed. Service connections to adjacent property may or may not be shown on the drawings. It shall be the responsibility of the Contractor to determine the exact location of all utility owners and request that they locate and mark any existing utilities and their appurtenances and service connections which may be affected by the contract work. In addition, the Contractor shall notify the Engineer as to any utility, appurtenances and service connections located by him which have been incorrectly shown or omitted from the drawings.

Unless otherwise specified the Contractor shall remove all interfering portions of utilities which are shown on the drawings as "abandoned" or "to be abandoned in place", and which interfere with the construction of the project. All costs involved in said removals shall be included in the prices bid for the various items of work. All such abandoned utilities removed by the Contractor shall be stored on the site where directed and shall remain the property of the owner utility company or Contracting Agency as determined by the Engineer.

Where utilities are shown on the drawings as "abandoned" or "to be abandoned in place", it shall be the Contractor's responsibility to contact the utility company involved, as required in 5.11, herein, prior to excavating around such utilities to ascertain that the abandonment of the utility has been completed.

In certain cases where indicated on the drawings, the Contractor shall locate utilities in advance of his construction operations. In these cases the Contractor shall backfill the excavations and shall construct either a temporary or permanent resurfacing over the backfill. The temporary resurfacing shall be constructed when the exploratory excavations are made in an area located within the proposed project excavations.

The permanent resurfacing when specified shall be constructed when the exploratory excavations are made in an area located outside the proposed project excavation. Said permanent resurfacing shall be of the type and thickness specified or as field conditions may otherwise require. In either case, the excavations shall be backfilled by the methods and to the relative density specified.

This work shall be performed as soon as practical after award of the contract and in any event a sufficient time in advance of construction to avoid possible delays to the Contractor's work. All costs for making such exploratory excavations (including the backfilling and the resurfacing as specified herein) shall be included in the prices bid for the various items of work.

Utilities which upon exploration are found to interfere with the permanent project work will be relocated, altered, or reconstructed by others in accordance with the provisions of Section 5.05 herein, or the Engineer may approve and order changes in location, line or grade of structures being built, in order to avoid the utilities. The cost of such changes will be paid for under applicable bid items or as "Extra Work" as provided under section 4.07.

Work required in connection with utilities because of interference with contract work will be performed and paid for as specified in the following paragraphs.

5.05 BY OTHER THAN THE CONTRACTOR

When it is stated in the detailed specifications or indicated on the drawings, that a utility is to be relocated, altered or reconstructed by other than the Contractor; the Contracting Agency will conduct all negotiations with the owners in respect to such work and the work shall be done at no cost to the Contractor.

Service connections which physically interfere with project structures or appurtenances, whether or not so stated or indicated, shall be relocated by other than the Contractor; except as otherwise specified or unless directed by the Engineer in accordance with section 5.08.

5.06 BY THE CONTRACTOR UNDER A SPECIFIC CONTRACT ITEM

When the bidding schedule contains a separate item covering the relocation, alteration, or reconstruction of a utility by the Contractor, the price bid for said item shall cover all costs involved in such work.

The Drawings and detailed specifications will give the construction details for the work, and unless the time at which the work must be done is specified in the detailed specifications, the Contractor shall coordinate with the owner in respect to when the work is to be done.

5.07 BY THE CONTRACTOR BUT NOT UNDER A SPECIFIC CONTRACT ITEM

When work on a utility is specified or indicated on the drawings to be done by the Contractor, but is not included as a separate contract item in the bidding schedule, the Contracting Agency will make all arrangements with the owner of the utility in respect to the construction details, however, the Contractor shall coordinate with the owner as to when the work is to be done. Any costs for such work shall be absorbed in the unit prices or included in the lump sum amounts bid for the various contract items.

5.08 BY THE CONTRACTOR _ SERVICE CONNECTIONS (EXCEPT SANITARY SEWERS)

For the purpose of these specifications, service connections shall be construed to mean all, or any portion of, the conduit, cable or duct which connects a utility main distribution line to the meter box of an individual user.

Except when shown on the drawings to be relocated by others, and except as otherwise specified herein, the alteration or permanent relocation of service connections which physicallly interfere with project structures, or appurtenances thereto, which are to be constructed under this contract shall, when directed by the Engineer, be arranged for by the Contractor in accordance with the requirements of the utility owner. The Costs for such work will be paid for as "Extra Work" as per section 4.07.

5.09 BY THE CONTRACTOR FOR HIS OWN CONVENIENCE

The temporary or permanent relocation or alteration of utilities including service connections, desired by the Contractor for his own convenience shall be the Contractor's own responsibility

and he shall make all arrangements regarding such work. The costs of such work shall be absorbed in the unit prices or included in the lump sum amounts bid for the various contract items.

5.10 BY THE CONTRACTOR OR BY OTHERS - UNKNOWN UTILITIES DISCLOSED DURING CONTRACT WORK

In the event that a utility is disclosed subsequent to the award of the contract, such utility not being indicated on the drawings, or in the event that an existing utility is found to be in a materially different location than shown on the drawings and thus requires additional or more costly work on the part of the Contractor for its maintenance, relocation, or support, the necessary alteration, relocation, proper support and protection shall be done and paid for as follows:

a. When said utility is found to occupy the space to be occupied by a part of the permanent works to be constructed, or when utility is, in the opinion of the Engineer, in such close proximity to the new work as to require the relocation or alteration of said utility the Contracting Agency will arrange for such relocation or alteration, or require the Contractor to do so as "Extra Work" as per section 4.07.

b. When any portion of a utility is in close proximity and more or less parallel to the structure of conduit and does not lie between the vertical planes or pay lines specified in subparagraph a. above, the Contractor shall advise the owner thereof, and in cooperation with the owner, provide and place the necessary support for proper portection to insure continuous and safe operation of the utility structure. All costs for such work shall be borne by the Contractor.

c. With the exception of service connection, when said utility lies within the excavation but does not intercept the permanent works to be constructed and when the length of said utility between the vertical planes or pay lines specified in paragraph a. above, is less than five times the perpendicular distance between pay lines, the Contractor shall maintain the utility in place. The work of maintaining the utility in place will be considered as "Extra Work". (See section 4.07)

5.11 RESPONSIBILITY OF THE CONTRACTOR

The Contractor shall be held responsible for all costs for the repair of any and all damage to the contract work or to any utility (Whether previously known or disclosed during the work), as may be caused by his operations. Utilities not shown on the drawings to be relocated or altered by others, shall be maintained in place by the Contractor. Utilities which are relocated by others in order to avoid interferemce with structures and which cross the project work shall be maintained in their relocated positions by the Contractor. All costs for such work

shall be absorbed or included in the prices bid for the various items of work.

The Contractor shall notify the owners of all utilities at least 2 working days in advance of excavating around any of their structures.

5.12 DELAYS CAUSED BY FAILURE TO RELOCATE UTILITIES

Where parties other than the Contractor are responsible for the relocation of utilities, and a delay in the Contractor's work is caused by the failure on the part of said parties to remove or relocate such utilities in time to prevent such delay, or by any action or lact of action on the part of the Contracting Agency, it shall be understood that the Contractor shall not be entitled, as a result of such delay to his work, to damages or additional payments over and above the contract price.. If delays in the Contractor's work are caused by the reasons mentioned herein, the Contractor shall be entitled to an extension of time. The length of such extension of time will be determined by the Engineer with consideration as to the effect of the delay on the project as a whole.

In order to minimize delays to the Contractor caused by the failure of other parties to relocate utilities which interfere with structures, the Contractor, upon request to the Engineer, may be permitted to temporarily omit the portion of work affected by the utility. The portion thus omitted shall be constructed by the Contractor immediately following the relocation of the utility involved.

5.13 PERMANENT SURVEY MARKERS

The Contractor shall notify the Engineer not less than seven days prior to starting work in order that the Engineer may take necessary measures to insure the preservation of survey monuments, stakes, or bench marks without the consent of the Engineer, and shall notify the Engineer and bear the expense of replacing any that may be disturbed without permission. Replacement shall be done or arranged for only by the Engineer.

When a change is made in the finished elevation of the pavement of any roadway in which a permanent survey monument is located the Contractor shall, at his own expense, adjust the monument cover to the new grade unless otherwise specified.

5.14 LOT STAKES

Unless otherwise directed by the Engineer or shown in the plans, the Contractor shall preserve existing survey stakes that mark property lines and corners. Any stakes that become lost or disturbed by his operations shall be replaced at the Contractor's expense and by a Registered Civil Engineer or Registered Land Surveyor.

5.15 SURVEY SERVICE

The Engineer will furnish and set construction stakes establishing lines and grades as determined necessary by the Engineer for all work indicated on the plans or required under the contract, including lines and grades for street excavation and fill, finished subgrade, finished base gravel, curbs and gutters, walks, structures and utilities, and will furnish the Contractor all the necessary information relative to the lines and grades.

Line and grade stakes will be offset from the construction area. They will show the offset distances, stationing and required cut or fill to the finished grade or flow line as indicated on the plans or grade sheet. Upon request a copy of the grade sheet will be furnished to the Contractor. Grade stakes will be set by the Engineer to the finished grade of the subgrade and also of the base gravel, or as determined necessary by the Engineer, and the tops of these stakes marked blue or red.

The Contractor shall construct the work in accordance with the Engineer's stakes and marks, making use of them before they are disturbed, and shall be charged with full responsibility for conformity and agreement of the work with such stakes and marks.

The Contractor shall be responsible for the preservation of construction survey stakes and marks for the duration of their usefulness during construction. If any construction survey stakes are lost or disturbed, and in the opinion of the Engineer need to be replaced, such replacement shall be by the Engineer at the expense of the Contractor. The cost of replacing them shall be charged against, and shall be deducted from, the payment for the work.

The Contrator shall give notice to the Engineer not less than two working days in advance of when he will require survey services in connection with the laying out of any portion of the work.

5.16 PRIVATE ENGINEERS

Surveying by private engineers on permit projects or any other work under the control of the Contracting Agency shall conform in all respects to the quality and practice required of the Contracting Agency's surveyors as set forth in subsection 5.15 above.

5.17 LINE AND GRADE

All work, during its progress and upon its completion, shall conform to the lines, elevations, and grades shown on the plans. Distances and measurements, except elevations and structural dimensions, are given and made on horizontal planes.

Three consecutive points set on the same slope shall be used together in order that any variation from a straight grade can

be detected. If any such variation is found, it shall be reported to the Inspector; and, in the absence of such report prior to completion of grade, the Contractor shall be responsible for any error in the grade of the finished work.

5.18 PRESERVATION OF PROPERTY

The Contractor shall protect all public and private property including irrigation berms, insofar as it may be endangered by his operations and he shall take every reasonable precaution to avoid damage to such property.

Public or private improvements of facilities within the right of way not designated fro removal but visibly evident or correctly shown on the plans which are damaged or injured directly or indirectly by or on account of any act, omission, or neglect of the Contractor in the execution of the work shall be restored by the Contractor at his expense to a condition substantially equivalent to that existing before such damage of injury occurred, by repairing, rebuilding, or otherwise affecting restoration thereof, or if this is not feasible, a suitable settlement shall be made with the owner of the damaged property.

The Contractor shall give reasonable notice to occupants of buildings on property adjacent to the work to permit the occupamts to remove vehicles, trailers and other possessions as well as salvage or relocate plants, trees, fences, sprinkler systems, or other improvements in the right of way which are designated for removal or which might be destroyed or damaged by the Contractor's operations.

The Contracor shall be responsible for the protection of all designated trees and planted areas within the right of way. He shall also exercise care and conduct his operations so as to minimize damages to other planted areas.

5.19 DAMAGE TO RAILROADS

The provisions given elsewhere herein, which require the Contractor to protect property against damage, and which place upon the Contractor all responsibility for damage to property, injury to persons, and loss, expense, inconvenience and delay to the owners of property and others, shall be understood to apply in connection with railway lines or railroads the same as in connection with other kinds of property. In the protection of railway lines and railrodds, however, the Contractor will be required to exercise particular care to avoid any damage which might result in train wrecks or in delays in train service. In the performance of work in close proximity to railroad tracks, he shall consult with the railroad owners or officials in regard to means and methods of conducting the work, and, unless the Engineer orders otherwise, he shall use in the performance of the work means and methods which are not unsatisfactory to said owners or officials, and he shall at his own expense provide such trackwalkers and flagmen as

the said owners and officials may deem necessary for the adequate protection of the railroad property and train service.

The Contractor shall be solely and directly responsible to the owners and operators of such properties for any damage, injury, expense, loss, inconvenience or delay which may result from the carrying out of the work to be done under this contract, and if the Special Provisions so specify, he shall give bond or insurance in the amount therein specified to each corporation, company, partnership, or individual owning or operating any of the properties affected, in guarantee of this responsibility. Any extension of time granted the Contractor in which to complete the contract shall not relieve him or his surety from this responsibility.

5.20 PROTECTION OF MATERIALS AND WORK

The Contractor shall provide and maintain substantial and adequate protection as necessary to protect new or existing work, and all items of equipment and furnishings, for the duration of the contract, except that by Board action the Contractor may be relieved of certain responsibilities for maintenance and protection of completed portions of the work as provided under Section 23, hereof.

Unless relieved of responsibility as provided under section 5.21, the Contractor and his sureties shall be fully liable for any loss or damage to the works referred to in the contract, resulting from any cause whatsoever, including but not limited to fire, theft, vandalism, malicious mischief, or injury or damage by the elements, except for any loss or damage that may be occasioned by acts of God, acts of the public enemy, acts of governmental authorities, or any act, omission, or default of the Contracting Agency prior to completion of the project and final acceptance thereof by the Contracting Agency.

5.21 RELIEF FROM MAINTENANCE AND RESPONSIBILITY

Upon the request of the Contractor and with the approval of the Contracting Agency, or upon the order of the Contracting Agency, the Contractor will be relieved of the duty of maintaining and protecting certain portions of the work which are ready to be placed in service and which have been completed in accordance with the plans and specifications, including cleanup.

In addition, such action by the Contracting Agency will relieve the Contractor of responsibility for injury or damage to said completed portions of the improvement resulting from use by public traffic or from the action of the elements or from any other cause, excepting injury or damage resulting from the Contractor's own operations or from his negligence. The Contractor will not be required to again clean up such portions of the improvement prior to field acceptance, excepting for such items of work as result from his operations. However, nothing in this section shall be construed as relieving the Contractor from full responsibility for making good defective

work or materials found to be defective.

5.22 STORAGE OF MATERIALS IN PUBLIC STREETS, ROADS, OR HIGHWAYS

Materials shall not be stored in streets, roads, or highways for longer than four working days after being unloaded, unless a longer storage period is permitted by the Engineer. In the event the rate of progress of construction is such that the materials stored in streets, roads, or highways is not installed in its final position within the time period stipulated hereinabove, the Contractor shall, when so directed by the Engineer remove such materials to storage areas to be provided by the Contractor at his own expense.

Unless otherwise permitted by the Engineer, no storage of excavated material will be permitted in public streets, roads, or highways. After the placing of the backfill in said trench, all remaining excavated material shall be removed from the site of the work.

5.23 HISTORICAL AND ARCHAEOLOGICAL REPORTS

Where historical objects of archaeological and paleontological nature, including ruins, sites, buildings, artifacts, fossils and other objects of antiquity are encountered within the areas on which the contractor's operations are performed, the Contractor shall postpone operations in the area, shall preserve such objects from disturbance or damage and shall notify the Engineer of their existence and location.

Upon receipt of such notification, the Engineer will arrange for the disposition of the objects or for the recording of data relative thereto, and will notify the Contractor when it is proper for him to proceed with the work in the affected area. If the Contractor is directed by the Engineer to perform any work in salvaging said objects, the Contractor shall do so on the "extra work" basis set forth in section 4.07.

5.24 LIGHT, POWER, AND WATER

The Contractor shall furnish temporary light, power, and water complete with connecting piping, wiring, lamps, and similar equipment necessary for the work as determined by the Engineer.. The Contractor shall install, maintain, and remove his temporary lines upon completion of work. All expenses in connection with temporary services and facilities shall be paid by the Contractor.

Section 6 - Control of Materials

6.01 MATERIALS AND WORKMANSHIP

All materials, parts and equipment furnished by the Contractor shall be new, high grade, and free from defects and imperfections unless otherwise hereinafter specified. Workmanship shall be in accord with the best standard practices. Both materials and workmanship shall be subject to the approval of the Engineer.

All materials and workmanship not conforming to the requirements of those specifications shall be considered as defective and will be rejected. Defective material whether in place or not, shall be removed immediately from the site of the work by the Contractor at his expense when so directed by the Engineer. No rejected material, the defects of which have been subsequently corrected, shall be used until approval in writing has been given by the Engineer.

In the event any defect in material or workmanship is of a minor nature and the Engineer determines that it is not of such consequence as to result in a dangerous and undesirable condition, the Contracting Agency shall have the right to retain such work and make such deductions in the payment therefor as they determine reasonable and in the public interest. Such determination by the Contracting Agency shall be final.

6.02 TESTS OF MATERIALS

Except as may otherwise be provided, all testing that may be required by the Contracting Agency to determine the quality, fitness and suitability of such materials shall be performed under the direction and upon the order of the Engineer, and at no expense to the Contractor; samples being secured and tested whenever considered necessary by the Engineer. In those cases in which the Contractor is required to provide and bear the expense of such testing the specifications or drawings will definitely so state.

The Contractor, at his own expense, shall deliver the materials for testing at the time and to the place designated by the Engineer.

6.03 TRADE NAMES AND EQUALS

Whenever in the specifications any particular materials, process, and/or equipment is indicated or specified by patent, proprietary, or brand name, or by name of manufacturer, such wording shall be deemed to be used for the purpose of facilitating description of the material, process, and/or equipment desired, and shall be deemed to be followed by the words "or equal". The lists of acceptable materials indicated in various sections of the specifications, or on the drawings, for materials are not intended to be comprehensive lists, or in any order of preference. The Contractor may offer any material, process, and/or equipment which complies with the governing specification and which he considers to be equivalent to that indicated or specified.

If a substitute offered by the Contractor is not found by the Engineer to be equal to the material specified, or indicated, then the Contractor shall furnish and install the specified or indicated by name.

The Contractor shall, before installation, submit data substantiating a request for a substitution of "an equal" item.

The Contractor shall, at his own expense, furnish information and/or data concerning the material and/or equipment offered by him as an equivalent to that specified or indicated by name; and if the Engineer shall so require, the Contractor, at his own expense, shall have the said material tested as to its quality, strength, physical, chemical, and/or other pertinent characteristics, including durability, finish, efficiency, dimensions, service, and suitability to perform the function intended to be served by the material and/or equipment.

The method of performing the test or tests shall be subject to the approval of the Engineer, and the results of said tests shall be reported promptly to the Engineer, who shall evaluate the results thereof and shall determine whether or not the substitute material and/or equipment so tested is deemed to be equivalent, and his findings shall be final. Installation and use of the material shall not be made until such substitute material has been approved by the Engineer.

The time specified for completion of the work under the contract shall not be affected by any circumstance whatsoever developing from the provisions of this section.

6.04 OREGON PRODUCED MATERIALS

The Contractor shall comply with the applicable provisions of sections 279.036 through 279.044 of the Oregon Revised Statutes, which relate to restrictions on use of meterials produced outside of the State of Oregon.

All nonmetallic mineral construction materials that are to be used in the work to be done under the contract, excepting cement, sand, gravel, crushed rock and plaster, and excepting materials of kinds not produced or manufactured in Oregon, shall be Oregon produced or Oregon manufactures materials, unless the Contractor has submitted alternate proposals covering the use of such Oregon materials and the use of materials from outside the State, and the Contracting Agency has accepted the proposal which is based upon the use of materials from outside the State. Such alternate proposals shall be accompanied by letters setting forth quotations from producers or manufacturers of the prices f.o.b. the project of the materials produced or manufactured outside of Oregon which are proposed to be used by the Contractor in the work.

With respect to such common building materials as cement, sand, crushed rock, gravel, plaster, etc. the Contractor shall use Oregon produced or manufactured materials in all cases where the bid prices of such materials are no greater than those of similar materials produced or manufactured outside of Oregon.

The provisions in section 6.04 dd not apply to contracts on projects financed wholly or in part by Federal funds.

Section 7 - Responsibility To The Public

7.01 PUBLIC CONVENIENCE

The Contractor shall so conduct his operations as to offer the least possible obstruction and inconvenience to traffic, and he shall have under construction no greater amount of work than he can prosecute properly with due regard for the rights of the public.

The Contractor shall obtain prior approval from the Engineer for the closing or partial closing of any street, alley or other public thoroughfare. He shall also give advance notice of such closure to all agencies providing emergency services, including police, fire, and ambulance services.

Unless otherwise provided by the plans or project specifications or authorized by the Engineer, vehicular access to properties at established driveways and pedestrian access to building entrances shall be provided and maintained by the Contractor, except for such periods of time as may be reasonably necessary to expeditiously complete those construction operation which preclude such access.

The Contractor shall conduct his operations in a manner which will minimize interference with the normal use of property adjacent to the construction.

Occupants of property fronting on the street shall be given at least 24 hours advance notice that the entire street or half the street, as the case may be, will be closed to vehicular traffic whenever necessary for the normal prosecution of the work. Such notices shall be given by the Contractor unless otherwise directed by the Engineer, or otherwise specified in the Special Provisions. Parking of cars may be prohibited on streets where construction work, such as grading or paving operations are in progress. When directed by the Engineer, traffic shall be controlled or routed through the construction area, such as maintaining controlled or one-way traffic over one-half of the street while construction is progressing on the other half.

In order that all unnecessary delay to the traveling public may be avoided where ordered by the Engineer, the Contractor shall provide and maintain temporary "No Parking" and/or detour signs pilot cars, and station competent flagmen whose sole duties shall consist of directing the movement of public traffic either through or around the work. Signs shall be of standard size and design as approved by the Engineer amd shall comply with the requirements specified in section 27 hereof. Such signs shall be removed as soon as practicable or when directed by the Engineer.

The cost for all work involved in providing for public convenience including detours, as set forth in this article shall be considered as included in the prices paid for the various contract items of work and no additional allowance will be made.

7.02 DETOURS

The Contractor shall construct and maintain emporary detours as shown on the plans or specified in the Special Provisions, or as necessary to provide adequate passage of public traffic and for protection of his work, or as determined necessary by the Contracting Agency. Routing and width of detours shall be approved by the Engineer.

Unless otherwise specified, when a detour is required the Contractor shall be governed by the following:

A Permit will be required from the Contracting Agency for all detours of traffic.

1. One day duration

   (a) Passable - no gravel but graded
   (b) Water and maintain smooth and dust free

2. One day to one week duration

   (a) Gravel
   (b) Water
   (c) Maintain smooth and dust free

3. More than one week - if on a major or secondary street (if on a collector street, treatment No. 2 above will suffice).

   (a) Gravel 2 in. and graded
   (b) Penetration with a minimum of .30 gal. per sq. yd. MC 70
   (c) Maintain with patching of chuck holes.

4. General Conditions

   (a) If maintenance is not performed, the Contracting Agency will do the maintenance and bill the Contractor at rates specified in section 4.07 thru 4.10.

   (b) When directed by the Engineer detours shall be removed and all ditches, etc., restored before the permit is closed out. If restoration is delayed more than one week after completion of work, the Contracting Agency will restore the area and bill the Contractor.

   (c) Before pavement is cut, the Engineer must approve the construction and barricading.

(d) Provisions for public convenience and public safety shall be maintained in compliance with sections 7.01 thru 7.03 hereof.

The Engineer will reserve the right to estimate the expected time the detour will be in use and will order construction accordingly.

7.03 PUBLIC SAFETY

The Contractor shall erect and maintain temporary fences, traffic control signs, bridges, railings, lights, and barriers, taking all other necessary precautions, and place proper quards for prevention of accidnet. In the event any of the above items become misplaced, damaged, or destroyed, they shall be replaced immediately in their proper location.

All warning signs, barriers, barricades, lights and performance of flagmen shall conform to the "Oregon Manual on Uniform Traffic Control Devices for Streets and Highways" issued by the Oregon State Highway Department, local ordinances, and existing published rules and/or traffic control manuals and regulations of the Contracting Agency.

The Contractor shall at all times keep open or backfilled excavations in a safe or protected condition. In the event of the existence of unsafe or hazardous conditions in the Contractor's work or operations, the Contractor shall immediately take such measures as are necessary to eliminate the conditions.

The cost for all work involved in providing for public safety as set forth in this article shall be considered as included in the prices paid for the various contract items of work and no additional allowance will be made.

7.04 FIRE HYDRANTS

Access shall be provided to all fire hydrants at all times. Pavements and sidewalkds adjacent to fire hydrants shall be kept clean and clear of debris, materials and Contractor's equipment. The Contractor shall not draw any water from a fire hydrant for use on the work other than for extinguishing fire, without first obtaining permission from the owner. Slow-closing valves will be required in connection with the use of fire hydrants. Unnecessary wasting or leakage of water shall not be permitted.

In the event a fire hydrant is damaged, or for any reason becomes inoperative, or is placed out of service due to the nature of the construction, it shall be the Contractor's responsibility to immediately notify the owner and the Engineer.

7.05 USE OF EXPLOSIVES

The use of explosives will be permitted only when authorized in writing by the Engineer unless otherwise stated in the Special

Provisions. Explosives shall be handled, used, and stored in accordance with the provisions and requirements of all applicable laws, ordinances, and regulations with respect thereto.

The approval by the Engineer for rhe use of explosives shall not relieve the Contractor from his responsibility.

7.06 SAFETY

Construction materials, equipment, methods and workmanship shall be in accordance with applicable local ordinances and State laws. The Contractor shall comply with the lawful orders and codes issued by the Workmen's Compensation Board of the State of Oregon.

7.07 LABOR

The Contractor shall be bound by and comply with all applicable provisions of the Revised Statutes of the State of Oregon and shall keep informed of and observe and comply with, and cause all of his agents and employees to observe and comply with, all Federal, State, and local laws which in any way affect the conduct of the work of this contract.

None but competent workmen shall be employed on any work under these specifications; and any laborer, workman, mechanic, fore-- man, superintendent, or otherperson so employed who is found to be to incompetent, intemperate, troublesome, disorderly or otherwise objectionable, or who fails or refuses to perform his work properly and acceptably, shall be removed from the job immediately upon notification in writing, and not again employed on the work unless approved by the Engineer.

7.07 NONDISCRIMINATION OF LABOR

The attention of the Contractor is directed to the provisions of Chapter 659, Oregon Revised Statutes relative to unlawful employment practices and discrimination by employers against any employee or applicant for employment because of race, religion, color, or national origin. Particular reference is made to Section 659.030 ORS, which states that it is an unlawful employment practice for an employer, because of the race, religion, color or national origin of any individual, to refuse to hire or employ or to bar or discharge from employment such individual or to discriminate against such individual in compensation or in terms, conditions or privileges of employment.

In the event the contract is funded in whole or in part by Federal funds, the Contractor shall comply with all provisions of Executive Order No. 11246 or September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

In the event of the Contractor's noncompliance with the non-discrimination clauses of a contract so funded, or with any such rules, regulations, or orders, the contract may be cancelled, terminated, or suspended in whole or in part and the

Contractor may be declared ineligible for further Government contracts or Federally assisted construction contracts, in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invokes as provided in Executive Order No. 11246 of September 14, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

7.09 PREFERENCE TO WAR VETERANS

As required by ORS 408.220, the Contractor shall, in the employment of labor, give preference to war veterans, providing such veterans possess business capacity necessary to discharge the duties of the position.

7.10 MINIMUM WAGES

The Contractor shall comply fully with ORS 279.348 through 279.356, which provide in part that "the hourly rate of wage to be paid by any contractor or subcontractor to workmen upon all public works shall be not less than the prevailing rate of wage for an hour's work in the same trade or occupation in the locality where such labor is performed."

The provisions of this law do not apply to workmen or other persons regularly employed on a monthly or perdiem salary.

The "prevailing rate of wage", for the purposes hereof, shall be the rate of hourly wage and overtime paid in the locality, as hereinafter defined, to the majority of workmen in the same trade or occupation; provided, however, that if there is not a majority in the same trade or occupation paid at the same rate, the average rate of hourly wage and overtime paid in the locality to workmen in the same trade or occupation shall be the prevailing rate, and provided further, that when a contractor or subcontractor is a party to a state-wide agreement in effect with any labor organization, the rate of wages as established in the agreement shall be considered to be the prevailing rate in the locality.

If the wage paid by any contractor or subcontractor to workmen is based on a period of time other than an hour, the hourly wage shall be mathematically determined by the number of hours worked in that period.

The "locality", for the purposes hereof, shall be the largest city in the county or counties in which the work under the contract is performed.

In case any dispute arises as to what is the prevailing rate of wage for the same trade or occupation in the locality and that dispute cannot be settled by the parties involved, the dispute shall be referred to the Commissioner of the State Bureau of Labor, who will determine the prevailing rate of wage for the same trade or occupation in the locality.

The minimum hourly rate of wage, not less than the prevailing rate of wage, which may be paid to workmen in each trade or occupation required for the work under the contract employed in the performance of the contract either by the Contractor or subcontractor or by other person doing or contracting to do the whole or part of the work contemplated by the contract shall be as set forth in the Schedule of Minimum Hourly Wage Rates as may be included in the Special Provisions, and the workmen employed in the performance of the contract shall be paid not less than the applicable specified minimum hourly rate of wage as such is set forth in said schedule.

Before payment is made by or on behalf of the Contracting agency of any sum or sums due under the contract, the Contractor or his surety and every subcontractor or his surety shall submit a statement in writing in a form prescribed by the State Labor Commissioner certifying under oath the hourly rate of wage paid each classification of workmen employed by him upon the work under the contract, and further certifying that no workmen employed by him upon said work has been paid less than the prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract. These statements are to be submitted to the Engineer in the manner and at the times designated by him.

In case of conflict between any of the minimum hourly wage rates set forth in the schedule above referred to and other pertinent minimum hourly wage rates, as such other rates may have been set forth in the contract provisions in accordance with Federal regulations, the higher of the conflicting wage rates shall be applicable under the contract.

There is no representation on the part of the Contracting Agency that labor can be obtained at the hourly rates as may be shown in the Special Provisions. It is the responsibility of bidders to inform themselves as to local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of the payment of wage rates in excess of those listed.

7.11 SATURDAY, SUNDAY, HOLIDAY AND OVERTIME WORK

The Contractor shall comply fully with section 279.334 of the Oregon Revised Statutes, which reads as follows: "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 legal holidays."

However, if it is necessary for the Contractor to perform construction work on Saturdays, Sundays, legal holidays or outside the 8 hours regular working day, the Contractor shall first notify the Engineer of his intent to do so prior to commencing such "overtime work". In any event, all owrk shall be subject to approval of the Engineer. Prior to the start of such work, the Contractor shall arrange with the Engineer for the continuous or periodical inspection of the work, surveys, and tests of materials, when necessary.

7.12 PERMITS AND LICENSES

Except for private contracts or unless otherwise specified elsewhere in these specificiation, the Contracting Agency will obtain required permits for the work. The Contractor shall obtain all other permits and licenses and pay any fees connected therewith, having to do with his construction operation.

7.13 CLEARING AND BURNING PERMITS

The Contractor shall comply fully with ORS 477.246 which reads, in part, as follows: "(1) Everyone shall, before clearing any right of way for any highway or railroad, or any power, commercial telegraph or telephone line, or for any transmission or transportation utility right of way on any forest land, whether upon his land or that of another, where the clearing would constitute a fire hazard, file with the forester a general description of the right of way to be cleared. The forester shall issue a written permit for such clearing. The permit shall set forth the precautionary conditions and manner under which the clearing shall be done."

"(2) No one at any time engaged in clearing any right of way or forest land shall place on adjoining land or property any forest material or debris resulting from such clearing without the permission of the owner of the adjoining land."

7.14 LICENSING OF CONTRACTORS

The Contractor shall be licensed in accordance with all state and local requirements.

7.15 PATENTS, FEES OR ROYALTIES

In the event that any patented article, material or process is to be installed or used in the performance of the work as shown on the plans or particular specifications therefor, the Contractor shall pay the royalty chargeable, if any, and shall save, keep and hold the Contracting Agency harmless from all damage, costs and expenses by reason of any infringement of the patent thereof, and any loss to the Contracting Agency if enjoined from using such patented article or material and the incidental damage caused by the loss of use and damage to the Contracting Agency's property in removing same, and cost of replacing the article or material the use of which is enjoined. Provided further the Bond for Faithful Performance shall be deemed to expressly apply to this provision of the specifications.

7.16 LIABILITY FOR MONIES DUE STATE COMMISSIONS

The Contractor shall promptly pay all contributions or amounts due the State Industrial Accidnet Fund and the State Unemployment Compensation Trust Fund from such Contractor or his subcontractors, incurred in the performance of the contract, (see ORS 279.510).

The Contractor shall pay all sums of money withheld from his employees and payable to the State Tax Commission pursuant to ORS 315.575, 316.575 or 316.711 and 316.714.

7.17 LIABILITY FOR AMOUNTS DUE HOSPITAL ASSOCIATIONS, ETC.

The Contractor shall comply fully with ORS 279.320 which reads in part as follows:

"... The Contractor 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 Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor:

"(1) May or shall have deducted from the wages of his employees for such services pursuant to the terms of ORS 655.010 to 655.160 and any contract entered into pursuant thereto; or

"(2) Collected or deducted from the wages of his employees pursuant to any law, contract or agreement for the purpose of providing or paying for such services."

7.18 CONTRACTOR"S CONSTRUCTION EQUIPMENT

The Contractor shall furnish and maintain in good condition all equipment and facilities including stairs, ramps, runways, scaffolds, hoists, etc., as required for the proper execution and inspection of the work. All such equipment and facilities shall meet all requirements of all ordinances and laws applicable thereto.

7.19 RIGHT OF WAY

The right of way for the improvement will be provided by the Contracting Agency. Unless the plans or specifications show additional work area to be provided by the Contracting Agency, the Contractor shall make his own arrangements and pay all expenses for additional area required by him outside the limits of the right of way.

Section 8 - Prosecution and Progress

8.01 PROGRESS OF THE WORK

The Contractor shall commence the work within 10 calendar days after receiving notice to proceed, unless otherwise stated in the Special Provisions, and shall diligently prosecute the same to completion within the time limit specified.

8.02 CONTRACTOR"S CONSTRUCTION SCHEDULE

Before stargin work, the Contractor shall submit for approval his propsed construction schedule to the Engineer. In the event the Contractor desires to carry on operations in more than one location simultaneously he shall submit for approval a schedule therefor two weeks in advance of beginning such operations. In the event that the Contractor's proposed construction schedule does not meet the necessary construction program schedule as determined by the Contracting Agency, he may be required to resubmit a schedule that shall conform to an apprvoed program of construction operations. The Contractor must obtain from the Engineer written approval of a construction schedule prior to start of work.

8.03 SUSPENSION OF WORK

The Engineer shall have the authority to suspend the work wholly or in part for such periods as may be necessary because of unsuitable weather or unforeseen conditions or the failure of the Contractor to carry out lawful orders to comply with any of the provisions of the contract. The Contractor shall immediately suspend work when so ordered, and he shall resume work after such suspension only on written instructions from the Engineer. Upon receipt of such instructions to resume work, he shall immediately proceed with the work.

If through the fault of the Contracting Agency, the Contractor must suspend operations and incurs expenses or sustains losses which could not have been avoided by the judicious handling of forces and equipment, and if by a diligent prosecution of the work he could not have completed the work before such suspension, the Contractor will be paid such amounts as may be agreed upon between the Contractor and the Contracting Agency to be a fair and reasonable compensation and a commensurate extension of contract time will be granted.

If work is suspended through no fault of the Contracting Agency all such expenses and losses incurred by the Contractor during such suspensions of work shall be borne in full by him. In the event the Contractor fails to properly provide for public safety, traffic, and protection of the work during periods of suspension of work, the Contracting Agency may elect to do so, and deduct the cost thereof from monies due the Contractor.

8.04 TIME OF COMPLETION

The Contractor shall complete the work called for under the contract in all parts and requirements within the number of callendar days set forth in the contract. Unless otherwise provided, all work shall be performed during normal working days. A working day is defined as any day except Saturdays, Sundays, legal holidays, days on which the Contractor is specifically required by the contract to suspend construction operations, and days on which the Contractor is prevented from working by inclement weather or interference from utility relocation or alteration work. Credit for inclement weather or interference

from utility relocation or alteration work will be allowed only when the Contractor is prevented by such work will be allowed only when the Contractor is prevented by such weather or utility work or conditions resulting immediately therefrom, from proceeding for at least five hours with at least 75% of the normal labor and equipment force engaged in the current controlling operation or operations.

Should the Contractor prepare to begin work at the regular starting time in the morning of any day on which inclement weather or the conditions resulting from the weather, or the condition of the work, prevents the work from beginning at the usual starting time and the crew is dismissed as a result thereof, the Contractor will not be charged for a working day whether or not conditions should change thereafter during said day and the major portion of the day could be considered suitable for such construction operations.

The current controlling operation or operations is to be construed to include any feature of the work which, if delayed at the time being considered, could delay the completion of the work behond the contract period.

Determination of each nonworking day except Staurdays, Sundays, legal holidays, and days on which the Contractor is specificially required by the contract to suspend construction operations shall be made and agreed upon during such day by conference between the Engineer and the Contractor. In the event of failure to agree, the Contractor will be allowed 15 days in which to file a written protest setting forth in what respects he differs from the Engineer. Otherwise the decision of the Engineer shall be deemed to have been accepted by the Contractor as correct.

8.05 LIQUIDATED DAMAGES

It is agreed by the parties of the contract that in case all of the work required under the terms of this contract is not completed within the number of calencar days as specified therefor in the contract or any lawful extension thereof as provided herein, damage will be sustained by the Contracting Agency as a result thereof, but to definitely determine and ascertain the actual amount of such damage, either before or after the occurrence thereof would be difficult and impractical. The sum stated in the Special Provisions for liquidated damages for each and every calendar day that the completion of said work is delayed beyond the prescribed completion date, or lawful extansion thereof, is hereby stipulated as being the nearest and most exact measure of such damage than can be fixed at this or any subsequent time; and when so assessed by the Contracting Agency, the Contractor shall become liable for and shall pay to the Contracting Agency as liquidated damages and not as a penalty said smm per day for each and every calendar day of such delay. When the amount of liquidated damages is not stated in

the Special Provisions, it is agreed by the parties to the contract that the amount of liquidated damages shall be One Hundred Dollars ($100.00) per day for each and every calendar day of such delay. The amount of such liquidated damages may be deducted by the Contracting Agency from any compensation due, or that may become due, the Contractor under his contract, and the Contractor and his sureties shall be liable for any excess.

It is further agreed that if the work is not finished and completed in all parts and requirements within the number of calendar days as specified therefor in the contract or any lawful extension thereof as provided herein, the Contracting Agency will have the right to extend the time for completion if to do so seems best to serve its interests; and in case said Contracting Agency decides to so extend the time limit for the completion of the work, it shall have the further right to charge to the Contractor, his heirs, assigns, or sureties, all or any part as it may deem proper, the actual costs of engineering, inspection, supervision, and other overhead expenses, that are directly chargeable to the contract and accrue during the period of such extension, and deduct the amount thereof from the final payment for the work; provided, however, that the cost of the final survey and preparation of the final estimate will not be included in such charges.

In the event that the Contractor is directed to perform extra or additional work, the number of calendar days specified in the contract shall be extended by an amount determined by application to the original number of calendar days of the ratio that the value of the extra or additional work bears to the original contract value.

Should the nature of the extra or additional work be such that the Contractor believes that a longer time extension should be granted than that computed by the above procedure, he may notify the Engineer in writing.

The Contracting Agency may grant such additional time extension as it feels is warranted.

Should any default, act or omission of the Contracting Agency, act of the State, act of public enemy or act of God, epidemic, quarantine restriction, strike, freight embargo, fire or flood cause any delay in the completion of the work the Contractor will not be assessed for liquidated damages nor engineering or other overhead charges for the period of such delay, provided that he shall, within ten (10) days subsequent to the beginning of any such delay, file a written report as to the cause thereof with the Engineer, who will ascertain the facts relative thereto and the extent of the delay, and whose finding in connection therewith shall be final and conclusive. The Contracting Agency shall not be liable to the Contractor for any damages on account of such delay.

8.06 RESPONSIBILITY OF CONTRACTOR AND OF CONTRACTOR"S REPRESENTATIVE ON THE WORKS

The Contractor shall give his personal attention and supervision to the work until same is entirely completed. In the absence of the Contractor from the work, he sahll have a representative in charge who shall be competent to superintend and direct the progress of the work and who shall be authorized to receive insturctions and to act for the Contractor on all matters relating to the work. The name, address and telphone number of this representative shall be sent by letter to the Engineer immediately after the awarding of the contract.

8.07 PROVISIONS RELATIVE TO DEFAULT BY CONTRACTOR

If, at any time, the Contractor shall neglect or refuse to prosecute the work with reasonable diligence, or should refuse or neglect to perform the work according to the drawings and specifications, as interpreted by the Engineer, the Contracting Agency will give him written notice to proceed. If the Contractor fails to comply with such notice within a period of seven (7) days, he shall be in default of the contract. The Contracting Agency will have the right, without further notice to the Contractor, and without voiding the contract, to take possession of all materials, to complete the work, and to charge cost of so doing against the Contractor. Should the unpaid balance of the contract price exceed the expense of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expenses shall exceed the balance due the Contractor, the Contractor and his bondsmen agree to pay the excess to the Contracting Agency.

Notice, for the purposes of this section, may be served personally, or may be served by mail, adressed to the Contractor and his surety at their respective places of business as indicated in the contract documents.

The determination by the Engineer of the question as to whether any of the terms of the contract or specifications have been violated, or have not been performed saisfactorily, shall be conclusive upon the Contractor, his surety, and any and all other parties who may have any interest in the contract or any portion thereof.

The foregoing provisions of this section shall be in addition to all other rights and remedies availabe to the Contracting Agency under law.

8.08 TERMINATION OF CONTRACT

If conditions encountered during the progress of the work make it impossible or impracticable to proceed with the work, the Contracting Agency may order the termination of the contract. Upon such termination, the Contracting Agency will pay the Contractor

fair and reasonable compensation as agreed upon between the Contractor and the Contracting Agency. In the event that no agreement is reached between the Contractor and the Contracting Agency as to fair and reasonable compensation, the Contracting Agency will be liable to the Contractor only for the reasonable value of the work performed and any other actual costs sustained by the Contractor.

8.09 ADVERTISING

No advertising matter shall be attached or painted on surfaces of buildings, fences or canopies, except the names of contractors and subcontractors, with their addresses and the designation of their particular branch may be shown on signs of a removable type. Size and location of such signs shall be subject to approval of the Engineer.

8.10 ASSIGNMENT

No contract or any portion thereof, may be assigned without consent of the Contracting Agency except that money due the Contractor may be assigned as specified below.

The Contractor may assign money due or to become due him under the contract and such assignment will be recognized by the Contracting Agency, if given written notice thereof, to the extent permitted by law, but any assignment of money shall be subject to all proper setoffs and withholdings in favor of the Contracting Agency and to all deductions provided for in the contract, and particularly all money withheld, whether assigned or not, shall be subject to being used by the Contracting Agency for completion of the work in the event the Contractor should be in default therein.

8.11 SUBCONTRACTS

Names of subcontractors for all or any portion of the work shall be submitted to the Engineer prior to commencement of any subcontracted work. Such submittals shall state the types of work to be subcontracted and the names of the proposed Subcontractors. Subcontracting all or any portion of the work shall not be construed to relieve the Contractor of any of his responsibility under the contract.

No subcontractors will be recognized as such, and all persons engaged in the work of construction will be considered as employees of the Contractor. The Contractor will be held responsible for theri work, which shall be subject to the provisions of the contract and specifications.

8.12 CERTIFICATE OF COMPLIANCE

The Contractor shall file with the Engineer, prior to the acceptance of the wor, a certificate in form substantially as follows: "I (We) hereby certify that all work has been performed and materials supplied in accordance with the plans, specifications and contract documents for the above work, and that:

1. Not less than the prevailing rates of wages as ascertained by the Contracting Agency has been paid to laborers, workmen and mechanics employed on this work;

2. There have been no unauthorized substitutions of subcontractors; no have any subcontracts been entered into without the names of the subcontractors having been submitted to the Engineer prior to the start of such subcontracted work;

3. No subcontract was assigned or transferred or performed by any subcontractor other than the original subcontractor, without prior notice having been submitted to the Engineer together with the names of all subcontractors;

4. All claims for material and labor and other service performed in connection with these specifications have been paid.

5. All monies due the State Industrial Accidnet Fund, the State Unemployment Eompensation Trust Fund (ORS 279.510), the State Tax Commission (ORS 315.575, 316.575, or 316.711 and 316.714), hospital associations and/or others, (ORS 279.320), have been paid."

Section 9 0 Measurement and Payment

9.01 METHODS OF MEASUREMENT

Materials and items of work which are to be paid for on the basis of measurement shall be measured in accordance with the methods stipulated in the particular sections herein covering materials or types of work.

When material is to be paid for on a volume basis and it would be impracticable to determine a volume by the specified method of measurement, or when requested by the Contractor and approved by the Engineer, the material will be weighed in accordance with the requirements specified for weight measurement and such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer and shall be agreed to by the Contractor before such method of measurement of pay quamtities will be adopted.

Unless otherwise provided, when mineral aggregate or roadway material is being paid for by weight, deductions from pay quantities will be made for the weight of water in excess of 3% if the material is to be treated with bitumen, and 6% if the material is to be waterbound.

9.02 MEASUREMENT OF QUANTITIES FOR UNIT PRICE WORKS.

Unless otherwise specified, linear or area quantities of work such as grading, landscaping, paving, curb, gutter, walk and other work of a similar nature shall be determined from

measurements of dimensions of such work and computed in horizontal planes. However, linear quantities of underground cable, piling, and timber, shall be considered as being the true length measured along the longitudinal axis thereof. For pipe work see related sections.

Volumetric quantities shall be determined by the average end area method.

9.03 UNITS OF MEASUREMENT

Measurements shall be in accordance with U.S. Standard Measures. A pound shall be avoirdupois. A ton shall be 2,000 pounds. The unit of liquid measure shall be the U.S. gallon.

9.04 CERTIFIED WEIGHTS

When payment is specified to be made on the basis of weight, the weighing shall be done on certified platform scales sealed by the State Sealer of Weights and Measures or the City Sealer of Weights and Measures as defined by sections 618.010 through 618.090, Oregon Revised Statutes. The Contractor shall furnish the Engineer with certificates issued by the Sealer of Weights and Measures showing the actual net weights together with the information required by section 618.230, Oregon Revised Statutes. The Contractor shall pay all costs, if amy, in connection with obtaining said certificates. The Contracting Agency will accept the certificates as evidence of the weight delivered.

9.05 PAYMENT

Once each month, the Engineer will made an approximate measurement of the work performed to that date and an estimate of the value thereof based on the contract prices. When the work has been satisfactorily completed, the Engineer will determine the final quantity of work performed and prepare the final estimate of the value thereof. The quantities listed in the bid schedule do not govern final payment. Payments to the Contractor will be made only for the actual quantities of contract items performed in accordance with the plans and specifications and if upon completion of the construction these actual quantities show either an increase or decrease from the quantities given in the bid schedule, the contract unit prices will still prevail.

In unit price contracts, when an item for mobilization is included in the bid, this item shall include the cost of assembling of materials, plant, and equipment as set forth in said bid item and as more fully described in the specifications. An evaluation for the purpose of payment for mobilization will be included in progress estimates in unit price contracts only when mobilization is so set forth as an item in the bid. In such cases, the specifications will indicate a fixed sum or a percentage of the total bid price as a maximum that may be bid on this item.

From each progress and final estimate, exeept on contracts for County roads and bridges, or unless otherwise required by the Special Provisions, applicable Federal or State laws or local ordinances, 10% will be deducted and retained by the Contracting Agency, and the remainder less the amount of all previous payments will be paid to the Contractor. In compliance with ORS 368.245, which relates to contracts for County roads and bridges, 15% will be deducted from each progress and final estimate and retained by the Contracting Agency, and the remainder less the amount of all previous payments will be paid to the Contractor.

At the expiration of 35 days from the date of acceptance of the work by the Contracting Agency, provided that the Contractor has furnished the Contracting Agency satisfactory receipts for all labor and material bills and vaivers of liens from any and all persons holding claims against the work, and has furnished the Contracting Agency with the certifications of wage rates as required by section 279.345, Oregon Revised Statutes, the amount deducted from the final estimate and retained by the Contracting Agency will be paid to the Contractor, with the exception of such amounts as are required by law to be further retained, nor on any payment tendered by the Contracting Agency and acceptance thereof is refused by the Contractor.

Payments for work or materials performed or funished under an assessment proceedings contract will be made as provided in the particular proceedings or legislative act under which such contract was awarded.

Section 60 - Pipe Materials and Testing for Sewers, Drains and Culverts

60 - 1 Description

Pipe used in sanitary sewer construction, unless otherwise specified, shall be concrete, vitrified clay or asbestos cement. Pipe used in underdrains shall be concrete, vitrified clay, asbestos cement or corrugated metal. Pipe used in culverts, unless otherwise specified shall be concrete, vitrified clay or corrugated metal falvanized pipe. All sanitary sewer pipe shall have flexible gasketed joint unless otherwise psecified. Storm drain pipe shall be cement mortar joint or rubber gasketed unless otherwise specified. Culvert pipe shall be jointed as specified. However, where rubber gasket joints are required in smooth bore material to require tight joints all materials must so qualify.

60-2 GENERAL

Where reference is made to an ASTM or AASHO designation it shall be understood to be the latest revision at time of call for bids, except as noted on the plans or in the special provisions.

60-3 MATERIALS AND TESTING

3.01 Pipe Materials

3.01A Concrete Pipe. Non-reinforced

Nonreinforced concrete pipe shall conform to ASTM designation C14 and shall be of the table of strength designated.

3.02 JOINTING MATERIALS

3.02A Flexible Gasketed Joints

Flexible joints shall be rubber gasketed when used with concrete pipe and conform to ASTM C443. Asbestos-Cement joints shall conform to ASTM D1869. Clay pipe shall conform to ASTM C425.

Gasketed material shall be stored in a cool, clean place, protected from sunlight and contaminants until ready for installation on the pipe. Pipes with gaskets affixed shall be installed in the sewer line within 28 daya, unless adequately protected against sunlight and contaminants.

All surfaces of the joint upon or against which the gasket may bear shall be smooth, free from spalls, cracks or fractures and imperfections whch would adversely affect the performance of the joint.

The joints of the pipe shall be of such design that they will withstand the forces caused by the compression of the gasket, when joined, without cracking or fracturing.

The rubber type gasket shall be the sole element depended upon to make the joint flexible and watertight.

The gasket shall be a continuous ring which fits snugly into the annular space between the overlapping surfaces of the joints of the pipe to form a flexible watertight seal. The gasket shall not be stretched more than 20% of its original

circumference when seated on the spigot or tongue end of the pipe.

The annular space, including the manufacturer's tolerances, between the gasket bearing surfaces of the respective cones when the joint has been closed shall not be more than 75% of the uncompressed thickness of the applied gasket.

All flexible gasketed joints shall be subject to the following yard tests:

A. With pipe in proper alignment. No less than three nor more than five pipes selected from stock by the Engineer shall be assembled according to installation instructions issued by the manufacturer, and with ends bulkheaded and restrained against internal pressure shall be subjected to ten(10) psi hydrostatic pressure with no resultant leakage at the joints. When approved by the Engineer, internal hydrostatic pressure may be applied by a suitable joint tester.

B. With pipe in maximum deflected position. Upon completion of the test for pipe in proper alignment, the test section shall be deflected to create a position one-half (½) inch wider than the fully compressed position on one side of the outside perimeter. When thus deflected, there shall be no leakage at the joints from an applied internal hydrostatic pressure of ten(10 psi. When approved by the Engineer, internal hydrostatic pressure may be applied by a suitable joint tester.

C. With Joints Under Differential Load. The Test section shall be supported on bloacks, or otherwise, so that one of the pipes is suspended freely between adjacent pipes, bearing only on the joints. The suspended pipe shall then be loaded, in addition to the weight of the pipe, an amount as given in the following table:

Diameter	Load per foot Laying Length up to 4 feet	Total Load for Pipes 4 ft. and Over
4 inches	650 lbs.	2600 lbs.
6	1000 lbs.	4000 lbs.
8	1300 lbs.	5200 lbs.
10	1400 lbs.	5600 lbs.
12	1500 lbs.	6000 lbs.
15	1850 lbs.	7400 lbs.
18	2200 lbs.	8800 lbs.
21	2500 lbs.	10,000 lbs.
24 and over	2750 lbs.	11,000 lbs.

While under this load, the stressed joints shall show no leakage when subject to five (5) lbs., hydrostatic pressure. As an acceptable alternate, one-half of the load may be applied on the bell of the suspended pipe.

3.04 CAP FOR FITTINGS

Fittings as required shall be capped with a plug and joined by rubber gasket or equal method to withstand all test pressures involved without leakage.

60-4 MEASUREMENT AND PAYMENT

Measurement and payment for pipe and incidental accessories, and for the testing as has been specified herein, will be included in such other of the sewer and culvert sections as their use is related to. Accessories and testing shall be considered as incidental to the materials affected and the costs thereof shall be included in the unit contract prices of applicable bid items in the proposals.

Section 61 - Trench Excav., Backfill, Foundation and Bedding for Sewers, Drains and Culverts

61-1 Description

Trench excavation and backfill shall include all excavation, backfilling, disposal of surplus material, and all other work incidental to the construction of trenches, including any additional excavation which may be required for man holes or other structures forming a part of the pipe line and not otherwise classified as "Structure Excavation".

61-2 CLASSIFICATION

Trench excavation and backfill shall be classfied as Class A or Class B for earth excavation, Class C for rock excavation, and Class D for excavation in unsuitable earth below grade. The approximate limits and quantities for Classes A and B will be shown on the construction plans.

Classes A,B, and C excavation and backfill, where ordered by the Engineer, shall extend to the bottom of the pipe zone. Beyond this depth, Class D Excavation will be paid for.

The Engineer shall have the authority to change classifications and the limits thereof as he may deem necessary, consistent with requirements outlines under definitions of the classifications.

2.01 TRENCH EXCAVATION AND BACKFILL, CLASS A

Class A shall be trench excavation where the excavated material is piled beside the trench as it is removed and backfilled from this position, or wasted immediately adjacent to the excavation. The disposal of excess material resulting from pipe volume shall be considered as incidental to Class A, unless otherwise provided for in the special provisions.

2.02 TRENCH EXCAVATION AND BACKFILL, CLASS B

Class B shall cover all cases of trench excavation where the excavated material is transported to another site for wasting and the trench is backfilled with bank run gravel or sand as specified on the plans or in the special provisions. When bank run gravel is specified, it shall conform to Section 26-2, excepting that 100 percent of the material shall pass the 2½ inch square opening.

The Contractor shall secure and maintain all necessary waste sites unless otherwise designated on the plans or in the special provisions.

2.03 TRENCH EXCAVATION AND BACKFILL CLASS C

Class C shall cover the removal and disposal of solid rock, i.e. all material which by actual demonstration, cannot, in the Engineer's opinion, be reasonably excavated with a 3/4 yard Bucyrus-Eerie 22-B backhoe equipped with a 19-foot boom.

general duty dipper and rock points, or similar approved equipment and which in fact, removed by systematic drilling and blasting, and also boulders exceeding one-half cubic yard in volume. All rock, boulders or stones shall be removed to the bottom of the pipe zone.

Class C shall be supplemental to either Class A or B as shown on the construction plans or designated by the Engineer. Payment for Class C shall be in accordance with Section 61-4.01B and shall be in addition to the payment made for either Class A or B.

2.04 TRENCH EXCAVATION AND BACKFILL, CLASS D

Class D shall apply to the excavation of unsuitable material which lies below the bottom of the pipe zone, the removal of which may be ordered by the Engineer. Excavated materials shall be transported to another site for wasting and the trench backfilled to the bottom of the pipe zone with foundation material as specified in Section 61.3.03D.

The Contractor shall secure and maintain all necessary waste sites unless otherwise designated on the plans or in the special provisions.

61-3 CONSTRUCTION DETAILS

3.01 EXCAVATION

The length of trench excavated in advance of the pipe laying shall be kept to a minimum, and in no case shall it exceed one hundred and fifty (150) feet unless specifically authorized by the Engineer.

Below the crown of the pipe, trench widths shall not exceed:

15-inch diameter and smaller....1½x inside diameter + 12 in.
18-inches diameter and large....1½ x inside diamter + 18 in.

In all cases, trenches must be of sufficient width to permit proper jointing of the pipe and backfilling of material along the side of the pipe. Trench width at the surface of the ground shall be kept to the minimum amount necessary to install the pipe in a safe manner. Trenches shall be excavated with vertical trench walls. Trenches wider than the maximum specified may result in a greater load of overburden than the pipe is designed for and, consequently, if the maximum trench width is exceeded by the Contractor without the written authorization of the Engineer, the Contractor will be required at his own expense to provide pipe of higher strength classification, or to provide a higher class of bedding, as may be deemed necessary by the Engineer.

Excavation for manholes and other structures shall be sufficient to provide a minimum of twelve (12) inches between their surfaces and the sides of the excavation.

All material excavated from trenches and piled adjacent to the trench or in a roadway or public thoroughfare shall be piled and maintained so that the toe of the slope of the material is at least two (2) feet from the edge of the trench. It shall be piled in such manner as will cause a minimum of inconvenience to public travel, and provision shall be made for merging traffic where such is necessary. Free access shall be provided to all fire hydrants, water valves and meters, and clearance shall be left to enable free flow of storm water in all gutters, other conduits, and natural water courses.

3.02 DEWATERING

Pipe trenches shall be kept free from water during pipe laying and jointing by such method as the Contractor may elect, provided the method is acceptable to theEngineer. The Contractor shall be responsible for damages of any nature resulting from the dewatering operations, notwithstanding tacit approval of the method by the Engineer.

Dewatering of the trench shall be considered as incidental to the construction and all costs thereof shall be included in various unit contract prices in the proposal, unless otherwise provided in the special provisions.

3.03 FOUNDATIONS AND BEDDING

Proper preparation of foundation, placement of foundation material where required and placement of bedding material shall precede the installation of all sewer and culvert pipe. This shall include necessary leveling of the native trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to a uniform grade so that the entire length of the pipe will rest firmly on a well compacted material, so the backfill material around the pipe will be placed in a manner to meet requirements specified hereinafter.

3.03B CLASSIFICATION OF BEDDING

Bedding procedures shall be classified as Class A, Class B, Class C, and Class D and shall apply to the pipe zone defined as that portion of the trench between the sides of the trench, 4 inches below the bottom of the pipe for pipe 27 inches in diameter and less and 6 inches for pipe 30 inches in diameter or larger and 12 inches above the top of the pipe. The approximate limits for the various classes of bedding will be indicated on the construction plans where it is feasible to do so.

Where no special reference is made to the classification of bedding on the plans or in the specifications, it shall be construed that all bedding procedures shall be as described for Class C.

The Engineer shall have the authority to change bedding classifications and the limits thereof as he may deem necessary during

the progress of the construction, consistent with the requirements outlined under the definitions and requirements of the various classifications contained herein.

Where unauthorized excavation has been made below the established grade, the Contractor shall provide, place and compact suitable bedding material to the proper grade elevation at his own expense.

3.03B1 CLASS A. BEDDING.
Class A bedding shall consist of a pipe cradle constructed of Class 4 (1½) Portland Cement Concrete as specified in Section 39-3.01. The bottom of the trench shall be fully compacted before placement of pipe or cradle.

Cradle construction shall conform to the details on the standard drawing. The balance of the pipe zone shall be filled with clean granular, well graded sand and gravel material of which 100% will pass the U.S. Standard 3/4 inch opening, and not more than 3 percent will pass the U.S. No. 200 (wet sieve), with a minimum sand equivalent of 50. (Section 6.)

The unit price per lineal foot for Class A Bedding shall be full compensation for furnishing all labor, equipment and materials necessary to complete the work in accordance with these specifications.

3.03B2 CLASS B. BEDDING
Class B bedding shall consist of the leveling of the trench at the bottom of the pipe zone and the furnishing, placing and compacting of bedding materials in the entire pipe zone.

Bedding material used in classes B and C bedding shall consist of clean, granular, well graded sand and gravel material of which 100 percent will pass the U.S. Standard 3/4 inch opening, and not more than 3 percent will pass the U.S No. 200 (wet sieve), with a minimum sand equivalent of 50. (Section 6)

The unit contract price per linear foot for Class B Bedding shall be full compensation for furnishing all labor, equipment and materials necessary to complete the work in accordance with these specifications.

3.03B3Class C Bedding.
Class C bedding shall consist of the leveling of the trench at the bottom of the pipe zone and the furnishing, placing and compacting of bedding materials in the pipe zone up to 1/6 the outside diameter of the pipe. Select native material shall be placed and compacted in the balance of the pipe zone.

The bedding material for Class C bedding shall conform to bedding material for Class B bedding.

The unit contract price per linear foot for Class C bedding shall be full compensation for furnishing all albor, equipment and materials necessary to complete the work in accordance with these specifications.

3.03B4 CLASS D BEDDING.
Class D bedding shall consist of carefully excavating the trench to proper grade and placing select native material in the pipe zone and backfilling in accordance with Section 61-3.05. Class D bedding, as described, shall be considered as incidental to the construction and all costs thereof shall be included in other unit contract items of the proposal.

3.03C PIPE BEDDING IN SOLID ROCK EXCAVATION.
In solid rock excavation, all ledge rock, boulders, or stones shall be removed to the bottom of the pipe zone. All materials thus removed shall be replaced with the classification of bedding noted on the plans or directed by the Engineer.

3.03D FOUNDATION MATERIAL
Where unsuitable excavation has been removed, necessary foundation material shall be placed and compacted to form a suitable base for the replacement of the required thickness of bedding material. Where unsuitable native foundation materials have been removed from excavations, an approved replacement foundation material shall be placed to the required thickness. Such foundation material shall conform to one of the following gradations as called for on the plans, the special provisions, or as determined by the Engineer.

MATERIAL PASSING	CLASS A		CLASS B	
	Min.	Max.	Min.	Max.
2½" Square opening	98	100	95	100
2" Square opening	92	100	75	100
1½" Square opening	72	87	30	60
1¼" Square opening	58	75	0	15
3/4" Square opening	27	47	0	1
3/8" Square opening	3	14	-	-
U.S. No. 4 Sieve	0	1	-	-

Coarse aggregate shall contain no piece larger than five (5) inches, measured along the line of greatest dimension.

Where foundation material is required, all costs for its procurement and placement shall be included in the unit contract price per cubic yard for "Foundation Material. Class .....".

3.04 CRIBBING AND SHEETING
Unless otherwise provided in the special provisions, the Contract shall provide all cribbing and sheeting needed to protect the work, existing property, utilities, pavement, etc., and to provide safe working conditions in the trench. Such cribbing and sheeting shall be according to the Contractor's design which shall comply with applicable local and state safety codes.

Removal of any cribbing and sheeting from the trench shall be accomplished in such a manner as to fulfill the above requirements.

Damages resulting from improper cribbing or from failure to crib shall be the sole responsibility of the Contractor. Cribbing will not be a pay item and the cost thereof shall be included in the unit contract price for "Trench Excavation" of the particular class of trench excavation required, unless otherwise provided in the special provisions.

3.05 BACKFILLING

As the pipe is installed, it shall be backfilled by hand in the pipe zone with the materials specified for the applicable Class of pipe bedding. The materials shall be placed and compacted in 6 inch lifts to the top of the pipe zone taking care that the material is in contact with the entire periphery of the pipe. The material shall be so carefully placed that subsequent backfilling operations will not disturb the pipe in any way.

Temporary cribbing, sheeting, or other timbering shall be removed unless specific permission is given by the Engineer to leave it in place.

In backfilling the trench, the Contractor shall take all necessary precautions to protect the pipe from any damage or shifting of the pipe. In general, backfilling shall be performed by pushing the material from the end of the trench into, along and directly over, the pipe so that the material will be applied in the form of a rolling slope rather than by side filling which will damage the pipe. Backfilling from the sides of the trench will be permitted after sufficient material has first been carefully placed over the pipe to such a depth as the Engineer may approve.

Pipe placed below the water table shall be kept from floating by placing backfill material upon it, or by maintaining the water level at the bottom of the trench.

During all phases of the backfilling operations and testing as outlined herein, the Contractor shall protect the sewer installation, provide for the maintenance of traffic as may be necessary, and provide for the safety of property and persons.

The cost of backfilling shall be included in the unit contract price per linear foot for the particular class of trench excavation and backfill, and in addition thereto, payment will be made for compaction and backfill when included in the plans and proposal, or ordered by the Engineer.

3.06 COMPACTION OF TRENCH BACKFILL

Where compaction of trench backfill material is required, one of the following methods or combination thereof as set forth in the special provisions shall be used and payment will be made in

accordance therewith. The Engineer shall have the right to change methods and limits to better accomodate field conditions. The density of backfilled material shall meet requirements outlined in the special provisions.

3.06A WATER SETTLING
Water Settling shall be performed as specified in Section 16 entitled "Water", except that payment will be made on linear foot basis for the linear feet of trench water settled.

3.06A1 Water Uses Other Than Trench Backfill.
Water required for dust control and uses other than described in this section shall be considered incidental and the costs thereof shall be included in the unit contract price of applicable bid items in the proposal.

3.06B MECHANICAL TAMPER
The mechanical tamper shall meet the specifications described for it in Section 15.2.01A.

3.06C VIBRATORY COMPACTOR
The Vibratory Compactor shall be a single hand operated unit, a group hand operated unit, or a vibratory roller. Where vibratory units will be required on the job, it will be so specified in the special provisions, and the method of payment therefor will be included in the proposal.

3.07 TOP SOIL REMOVAL AND REPLACEMENT
Removal of top soil and replacement of it shall be performed in accordance with the provisions of Section 55 and payment will be made at the unit contract price per cubic yard as specified therein.

3.08 LAWN REMOVAL AND REPLACEMENT
Removal of lawn and the replacement of it shall be performed in accordance with the provisions of Section 56 and payment will be made at the unit contract price per square yard as specified therein.

61-4 MEASUREMENT AND PAYMENT

4.01 TRENCH EXCAVATION AND BACKFILL
Measurement for trench excavation and backfill will be by the linear foot whenever a single classification of trench excavation and backfill is involved for a continuous distance, and when it is so provided in the special provisions or bid proposal. Where trench excavation and backfill will be measured by the cubic yard the allowable width and depth will be as described hereinafter.

4.01A MEASUREMENT BY LINEAR FOOT
When measurement and payment is called for by a unit contract price per linear foot, the trench shall be measured continuously along center line from the beginning point to the terminus and including the distances through structures, excepting however, that if excavation for structures is a bid item in connection with the structures the allowable distance along center line through the structure excavation shall be deducted from the total length of trench.

The unit contract price per linear foot for "Trench Excavation and Backfill, Class ...," shall be full compensation for all labor, materials, tools and equipment required to excavate and backfill the trench in accordance with the plans and specifications; the unit contract price does not, however, include the work and expemse of foundation material, bedding material, water settling and mechanical compaction which, if required, will become separate items in the proposal.

4.01B MEASUREMENT BY THE CUBIC YARD

When mearsurement and payment is called for by a unit contract price per cubic yard, the volume shall be computed upon the following basis for length, width and depth of trench:

Length. The entire horizontal distance in feet along the center line of the trench, including measurement through manhole or structure locations, excepting, however, that the measurement through such structures will be deducted if the proposal carried a separate item of structure excavation that is applicable to the structures.

Width. For 24 inch pipe and smaller, the width upon which excavation will be calculated will be the inside diameter of the pipe plus 18 inches. For pipes with inside diameter greater than 24 inches, the calculated width will be the inside diameter plus 30 inches.

Depth. The vertical measurement shall be whichever is the lesser dimension arrived at from the following possible cases: (a) the vertical measurement from invert of pipe to original ground or paved surface, (b) the vertical measurement from invert of pipe to the scalped surface after removal of top soil or lawn, and (c) the measurement from invert of pipe to roadway excavation subgrade in cases where it is intended that sewer and street construction are to performed in conjunction with each other.

Measurement will be made at intervals of not more than 25 feet along the center line of the trench, and closer if the terrain justifies.

The unit contract price per cubic yard for "Trench Excavation and Backfill, Class ...", shall be full compensation for all labor, material, tools and equipment required to excavate and backfill the trench in accordance with the plans and specifications; the unit contract price does not, however, include the work and expense of foundation material, bedding material, water settling and mechanical compaction which, if required, will become separate items in the proposal.

4.02 PIPE BEDDING

Measurement for pipe bedding will be by the linear foot. The pipe bedding shall be measured continuously along centerline from the beginning point to the terminus and including the distances through structures, excepting however, that if bedding

for structures is a bid item in connection with the structures the allowable distance along centerline through the structure bedding shall be deducted from the total length of pipe bedding.

The unit contract price per linear foot for "Pipe Bedding Class .....", shall be full compansation for all labor, materials, tools, and equipment required to place the pipe bedding in accordance with the plans and specifications.

4.03 COMPACTION OF TRENCH BACKFILL

Measurement for compaction of trench backfill will be by the linear foot. The trench shall be measured continuously along centerline from the beginning point to the terminus and including the distances through structures.

The unit contract price per linear foot for compaction of trench backfill for water settling or mechanical compacting including mechanical tampers and vibratory compactors, shall be full compensation for all labor, materials, tools and equipment required to compact the trench backfill in accordance with the plans and specifications.

61-5 PAYMENT

Payment will be made for such of the following bid items as are included and shown on any particular contract:

1. "Trench Excavation and Backfill Class A" per linear foot
2. "Trench Excavation and Backfill Class B" per linear foot
3. "Trench Excavation and Backfill Class C" per cubic yard
4. "Trench Excavation and Backfill Class D" per cubic yard
5. "Pipe Bedding Class A" per linear foot
6. "Pipe Bedding Class B" per linear foot
7. "Pipe Bedding Class C" per linear foot
8. "Compaction of Trench Backfill - Water Settling" per linear foot
9. "Compaction of Trench Backfill - Mechanical Compaction" per linear foot
10. "Top Soil Removal and Replacement" per cubic yard
11. "Lawn Removal and Replacement" per square yard.

Section 62 - Pipe Laying, Jointing and Testing

62 - 1 DESCRIPTION

This section covers the pipe laying, jointing and testing of sanitary sewers, storm drains and culverts. The construction of these lines shall meet the requirements herein and as shown on the plans, special provisions and standard drawings.

Any pipe or appurtenance which inadvertently or otherwise has been laid or jointed in non-accordance with the specifications amd special provisions shall, upon direction of the Engineer at any time before final acceptance of the contract or before expiration of the quaranty period, be repaired or be removed and replaced at the expense of the Contractor, and to the satisfaction of the Engineer.

62--2 MATERIALS

The materials shall conform to requirements outlines in the various applicable section of the specifications.

62-3 CONSTRUCTION DETAILS

3.01 SURVEY LINE AND GRADE

Survey line and grade control hubs will be provided by the Engineer in a manner consistent with accepted practices.

The Contractor shall constantly check line and grade and in the event they do not meet specified limits described hereinafter, the work shall be immediately stopped, the Engineer notified, and the cause remedied before procedding with the work.

3.02 SEWER PIPE LAYING

Laying of sewer pipe shall be accomplished to line and grade in the trench only after it has been dewatered and the foundation and/or bedding has been prepared in accordance with Section 61. Mud, Silt, gravel and other foreign material shall be kept out of the pipe and off the jointing surfaces.

All pipe laid shall be retained in position by mechanical means or otherwise, as approved by the Engineer, so as to maintain alighment and joint closure until sufficient backfill has been completed to adequately hold the pipe in place. All pipe shall be laid to conform to the prescribed line and grade shown on the plans, within the limits that follow.

The sewer pipe, unless otherwise approved by the Engineer, shall be laid up grade from point of connection on the existing sewer or from a designated starting point. T e sewer pipe shall be installed with the bell end forward or upgrade, unless approved otherwise. When pipe laying is not in progress the forward end of the pipe shall be kept tightly closed with an approved temporary plug.

3.04 DEWATERING

Dewatering, sufficient to maintain the ground water level at or below the surface of trench bottom or base of the bedding course, shall be accomplished prior to pipe laying and jointing.

if not prior to excavation and placing of the bedding as called for in other sections of the specifications or special provisions. The dewatering operation, however accomplished, shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the trench. The normal water table shall be restored to its natural level in such a manner as to not disturb the pipe and its foundation.

3.05 BEDDING

The pipe bedding shall be placed so that the entire length of the pipe will have full bearing. No blocking of any kind shall be used to adjust the pipe to grade except when used with embedment concrete. Bell holes shall be dug as required to assure uniform support along the pipe barrel.

3.06 PLUGS AND CONNECTIONS

Plugs for pipe branches, stubs or other open ends which are not to be immediately connected shall be made of an approved material and shall be secured in place with a joint comparable to the main line joint, or stoppers may be of an integrally cast breakout design.

3.08 PIPE JOITING

All sanitary sewer pipe shall have flexible gasketed joints unless otherwise specified. All sanitary sewer pipe and side sewers shall be subject to tests described in Section 62-3.10.

3.08B Gasket Type Joints

Flexible gasketed joints shall be made in strict accordance with the instruction furnished by the pipe manufacturer, and shall be in accordance with other provisions described below except in any case where they may be inconsistent with the manufacturer's instructions.

Pipe handling after the gasket has been affixed shall be carefully controlled to avoid disturbing the gasket and knocking it out of position, or loading it with dirt or other foreign material. Any gaskets so disturbed shall be removed and replaced, cleaned and relubricated if required before the jointing is attempted.

Care shall be taken to properly align the pipe before joints are entirely forced home. During insertion of the tongue or spigot, the pipe shall be partially supported by hand, sling or crane to minimize unequal lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Since most flexible gasketed joints tend to creep apart when the end pipe is deflected and straightened, such movement shall be held to a minimum once the joint is home.

Sufficient pressure shall be applied in making the joint to assure that it is home, as described in the installation instructions provided by the pipe manufacturer. Sufficient restraint as specified in Section 62-3.02 shall be applied to the line to assure that joints once home are held so, until fill material under and alongside the pipe has been sufficiently compacted. At the end of the work day, the last pipe laid shall be blocked in an effective way to prevent creep during "down time".

3.08C Jointing of Dissimilar Pipes

For dissimilar pipes where suitable adaptor couplings are not available, the jointing shall be accomplished with a special fabricated coupling or concrete encasement expansion block, as approved by the Engineer.

3.10 TESTING FOR ACCEPTANCE

All sanitary sewer pipe and appurtenances shall be cleaned and shall be tested after backfill by exfiltration method for each first section of line laid between manholes and/or where a new sewer crew is used on any portion of the work, unless otherwise provided in the special provisions; excepting however, that if the condition where the ground water table are such as to preclude a proper exfiltration test, the Engineer may require infiltration testing. Low pressure air testing is an acceptable alternate to either hydrostatic method and shall conform to the standard test for low pressure air testing as per OCPM.

Storm sewer pipe and appurtenances shall be cleaned and may be tested after backfill.

All work involved in cleaning and testing sewer lines between manholes and/or rodding inlets as required herein shall be completed within 15 working days after backfilling of sewer lines and structures. Any further delay will require the written consent of the Engineer. TheContractor shall furnish all labor, materials, tools and equipment necessary to make the test, clean the lines and to perform all work incidental thereto. Precautions shall be taken to prevent joints from drawing during tests, and any damage resulting from tests shall be repaired by the Contractor at his own expense. The manner and time of testing shall be subject to approval of the Engineer, provided that the Engineer may limit pipe footage to be laid without testing.

All wyes, tees and stubs shall be plugged with flexible jointed caps, or acceptable alternate, securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable and for their removal shall provide a socket suitable

for making a flexible jointed lateral connection or extension.

In the event that the Contractor elects to test large diameter pipe one joint at a time, leakage allowances shall be converted from GPM per 100 feet to GPM per joint by dividing by the number of joints occurring in 100 feet. If leakage exceeds the allowable amount, corrective measures shall be taken and the line be then retested to the satisfaction of the Engineer.

3.10A Exfiltration Test

Prior to making exfiltration leakage tests, the Contractor may fill the pipe with clear water to permit mormal absorption into the pipe walls; provided, however, that after so filling the pipe he shall complete the leakage test within twenty-four (24) hours after filling. When under test, the leakage allowable shall comply with the provisions that follow.

Leakage shall be no more than five-tenths(0.5) gallon per hour per inch of diameter per one hundred (100) feet of sewer pipe, with a minimum test pressure of six (6) feet of water column above the crown at the upper end of the pipe or above the active ground water table, whichever is highest as determined by the Engineer. The length of pipe tested shall be limited so that the pressure on the invert of the lower end of the section tested shall not exceed sixteen (16) feet of water column, and in no case shall be greater than 700 feet. For each increase in pressure of two (2) feet above a basic six (6) feet measured above the crown at the lower end of the test station, the allowable leakage shall be increased by 10 percent, tabulated in the table which follows:

ALLOWABLE LEAKAGE IN GALS./ 100LINEAR FEET/HR

Head above crown on Lower End of Test Section

Pipe Size (Inches)	6 Ft.	8 Ft.	10 Ft.	12 Ft.	14 Ft.	16 Ft.
4	2.0	2.2	2.4	2.6	2.8	3.0
6	3.0	3.3	3.6	3.9	4.2	4.5
8	4.0	4.4	4.8	5.2	5.6	6.0
10	5.0	5.5	6.0	6.5	7.0	7.5
12	6.0	6.6	7.2	7.8	8.4	9.0
15	7.5	8.2	9.0	9.8	10.5	11.2
18	9.0	9.9	10.8	11.7	12.6	13.5
21	10.5	11.6	12.6	13.6	14.7	15.8
24	12.0	13.2	14.4	15.6	16.8	18.0
27	13.5	14.9	16.2	17.6	18.9	20.2
30	15.0	16.5	18.0	19.5	21.0	22.5
36	18.0	19.8	21.6	23.4	25.2	27.0
42	21.0	23.1	25.2	27.3	29.4	31.5
48	24.0	26.4	28.8	31.2	33.6	36.0
54	27.0	29.7	32.4	35.1	37.8	40.5
60	30.0	33.0	36.0	39.0	42.0	45.0
72	36.0	39.6	43.2	46.8	50.4	54.0

Testing of storm drains where specified shall be the same as for sanitary sewers, except that the calculated leakage allowable for acceptance shall be two (2) times that of a sanitary sewer.

The Contractor shall furnish all equipment, materials and labor necessary for making the leakage tests. Any arrangement of test equipment which will provide accurate means of measurement will be approved by the Engineer. The leakage test shall be made by the Contractor in the presence of the Engineer.

3.10B Infiltration Test

When the natural ground water table is above the crown of the higher end of the test section, the maximum allowable limit for infiltration shall be four tenths (0.4) gallon per hour per inch of internal diameter per 100 feet of length, with no allowance for external hydrostatic head.

3.10C Other Test Allowances

All lateral or side sewer branches included in the test section shall be taken into account in computing allowable leakage. An allowance of two tenths (0.2) GPH per foot of head above invert shall be made for each manhole included in a test section.

3.10D Air Testing

THE PRESUMTIVE TEST: The contractor may low pressure air test the line before backfilling the trench to aid the contractor in checking the installation for any defects and proper workmanship. This test is at the option of the contractor.

THE ACCEPTANCE TEST: The Contractor shall test the line as prescribed in the specificatons by the engineer or agency after the backfilling has been completed.

RECOMMENDED AIR TEST: The contractor shall furnish all facilities and personnel for conduting the test under the observation of the Engineers. The equipment and personnel shall be subject tot the approval of the Engineers. The Contractor shall clean the line before proceeding with the air test. All debris shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris or a damaged pipe shall prevent cleaning, the contractor shall remove the obstruction. The pipe or sections of pipe to be tested should be wetted before the air test is started.

Immediately following the pipe cleaning and wettings the pipe shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressur e reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before procedding further. The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 2.5 pounds per square inch greater than the average back pressure

of any ground water that may submerge the pipe.

The pipeline shall be consdered acceptable when tested at an average pressure of 3.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe when the section under test does not lose air at a rate greater than 0.003 cubic feet per minute per square foot of internal pipe area except that the minimum allowable rate of loss for the section shall not be less than 2 cubic feet per minute.

The requirements of this specification shall be considered satisfied if, during the time as computed according to the attached page entitled"Recommended Procedure for Conducting Acceptance Test", the pressure in the pipe line does not drop more than one p.s.i., below the initial pressure of 3.5 p.s.i., greater than the average back pressure of any ground water head that may submerge the (pipe) line.

Acceptance Test shall be made for each first section of line constructed, for every 1st reach of line instaffed where a new sewer crew is used, or wherever the Engineer may direct. The Contractor shall not proceed with any construction until the prerequisite of meeting the successful installation of each section is made, as mentioned above, to qualify the crew and/or material.

If the pipe installation fails to meet these requirements, the Contractor shall determine at his own expense the source or sources of leakage, and he shall repair or replace all defective materials or workmanship. The completed pipe installation shall meet the requirements of this test, or the alternate water exfiltration or infiltration test before being considered acceptable.

(a)Rotometer or Constant Pressure.

The line shall be tested at 3.0 psig and the volume of air leaked at this pressure shall be read by the use of a Rotometer placed in the sys tem.

The maximum rate of air loss for an acceptable sewer line shall not exceed 0.003 C.F.M. per square foot of interior pipe surface, or 2.0 C.F.M. minimum when subjected to a constant pressure of 3.0 psig. T e rate of loss to be determined when the system reaches an equilibrium state. For each foot of water table elevation above the invert of the pipe under test, the allowable loss shall be reduced six (6) percent.

(b) Time Pressure Drop Method

This method shall be co nducted according to the procedure described below.

Sample Calculations for Time Pressure Drop Method.
Example 1 (Refer to Nomograph on Page 188)
Given: 300 feet of 8 inch Pipe. Set straight edge on 8" in "d" column and 300 feet in "L" column. Read 0.92 on C scale and 215 on K scale. Reading on C scale is less than one so the K reading of 215 seconds would be the minimum time allowable (in seconds) for this run of nine.

Example 2:
Given: 500 feet of 10 inch Pipe. Set straight edge on 10 inch in right hand column and 500 feet in "L" column. Read C of 1.95 and K of 550. C is greater than one so divided C into K 550/1.95 = 282 seconds for this run of pipe. This result may also read on the Nomograph in column t.

2. The test equipment used with either method of air pressure testing shall be certified as satisfactory by the Engineer at the beginning of a job. The inspector may at any time require a calibration check of the instrumentation used, i.e., rotometers, bourdon gages, pressure reducing valves, etc.

AIR TESTING BY TIME PRESSURE DROP METHOD
Recommended Procedure for Conducting Acceptance Test

1. Clean pipe to be tested by propelling snug fitting inflated fubber ball through the pipe with water.

2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.

3. If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergency over the end of the probe. All gauge pressures in the test should be increased by this amount.

4. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.

5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any failures are observed, bleed off air and make necessary repairs.

6. After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stablize, adding only the amount of air required to maintain pressure.

7. After the two minute period, disconnect air supply.

8. When pressure decreases to 3.5 psig. start stopwatch. Determine the time in seconds that is required for the internal

air pressure to reach 2.5 psig. This time interval should then be compared with the time required by specification as computed below.

9. List size and length of all portions of pipe under test in table similar to one shown here.

Diameter inches	Length Feet	K= .11 d^2L	C=.003882 dL

Total K _____ Total C_____

Time Required by Specifications_____

10. By use of nomograph (Fig. 13) compute K and C. Use Scales d and L, read K and C, and enter these values in the table above.

11. Add all values of K and all values of C for pipe under test.

12. If the total of all C values is less than one, enter the total of all K values into the space for "Time Required by Specification."

13. If the total of all C values is greater than one, divide the total of all K values, by the total of all C values, to get tq. To make this division with the nomograph, use scales C and K, and read tq.

SAFETY PROVISIONS: The plugs must be firmly secured and care should be exercised in their removal. (The total force on a 12" plug at 4.0 p.s.i. is over 450 pounds.) Care must be excercised in not loading the sewer line with the full pressure of the compressor. Keep men out of manholes until the pressure has been released. If water leaks into the line after the plugs are installed and floods the air inlet and the needle on the air pressure gage indicates zero then possibly the water column has balanced the air pressure in this instance and care is necessary in releasing the pressure. If testing below ground water level; inject the air at the upper plug and/or turn the inlet up as with a water test apparatus. Gages, air piping manifolds and valves shall be located at the top of the ground. No one shall be permitted to enter a manhole where a plugged pipe is under pressure.

Air testing apparatus shall be equipped with a pressure release device such as a rupture disk or a pressure relief valve designed to relive pressure in the pipe under test at 6 p.s.i.

3.10E Payment for tests
The work of cleaning and testing and the furnishing of caps and plugs for the tests shall be considered as incidental to the construction and all costs incurred therefor shall be included in the unit contract price of pay items in the proposal.

The Contractor shall arrange for and provide all necessary water at his own expense, unless otherwise provided in the special provisions.

If the Contractor shall purchase water from a water utility at a fire hydrant on ar near the porject, he shall make all arrangements at his own expense and shall pay the utility on basis of actual quantity of water metered.

62-4 MEASUREMENT
Measurement for payment shall be by the linear foot of pipe laid and tested and shall be along the pipe through the tees and fittings. Measurements shall be from center to center of standard types of manholes or to inside face of structures, and shall be taken to the nearest one tenth (0.1) foot.

Measurement for tees and fittings shall be per each for each size as constructed.

62-5 PAYMENT
Payment for all pipe shall be the unit contract price "per linear foot" for each class, size and type of pipe laid and satisfactorily tested in accordance with the specifications. No additional compensation will be allowed for testing.

Payment for tees and fittings shall be the unit contract price "per each" for each size, including caps or plugs laid and tested. No additional compensation will be allowed for testing or providing the cap or plug.

Payment will be made for such of the following bid items as are included and shown on any particular contract:

1. "(size) (class) Pipe in Place," per linear foot.

2. "Tees or Wyes (size)," per each.

Section 63 - Manholes for Storm and Sanitary Sewers

63-1 DESCRIPTION
Standard manholes may be constructed of precast units or monolithic concrete, all in accordance to standard plans and these specifications.

Precast concrete manholes shall conform to ASTM C478. The minimim diameter in public rights of way shall be 42". For private property 42".

RECOMMENDED PROCEDURE FOR CONDUCTING ACCEPTANCE TEST

1. Clean pipe to be tested by propelling snug fitting inflated rubber ball through the pipe with water.
2. Plug all pipe outlets with suitable test plugs. Brace each plug securely.
3. If the pipe to be tested is submerged in ground water, insert a pipe probe, by boring or jetting, into the backfill material adjacent to the center of the pipe, and determine the pressure in the probe when air passes slowly through it. This is the back pressure due to ground water submergence over the end of the probe. All gauge pressures in the test should be increased by this amount.
4. Add air slowly to the portion of the pipe installation under test until the internal air pressure is raised to 4.0 psig.
5. Check exposed pipe and plugs for abnormal leakage by coating with a soap solution. If any failures are observed, bleed off air and make necessary repairs.
6. After an internal pressure of 4.0 psig is obtained, allow at least two minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.
7. After the two minute period, disconnect air supply.
8. When pressure decreases to 3.5 psig, start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. This time interval should then be compared with the time required by specification as computed below.
9. List size and length of all portions of pipe under test in table similar to one shown here.

Diameter inches	Length Feet	$K = .011\ d^2L$	$C = .0003882\ dL$

Total K _____ Total C _____

Time required by specification _____

10. By use of nomograph (Fig. 13), compute K and C. Use scales d and L, read K and C, and enter these values in the table above.
11. Add all values of K and all values of C for pipe under test.
12. If the total of all C values is less than one, enter the total of all K values into the space for "Time Required by Specification."
13. If the total of all C values is greater than one, divide the total of all K values, by the total of all C values, to get t_q. To make this division with the nomograph, use scales C and K, and read t_q.

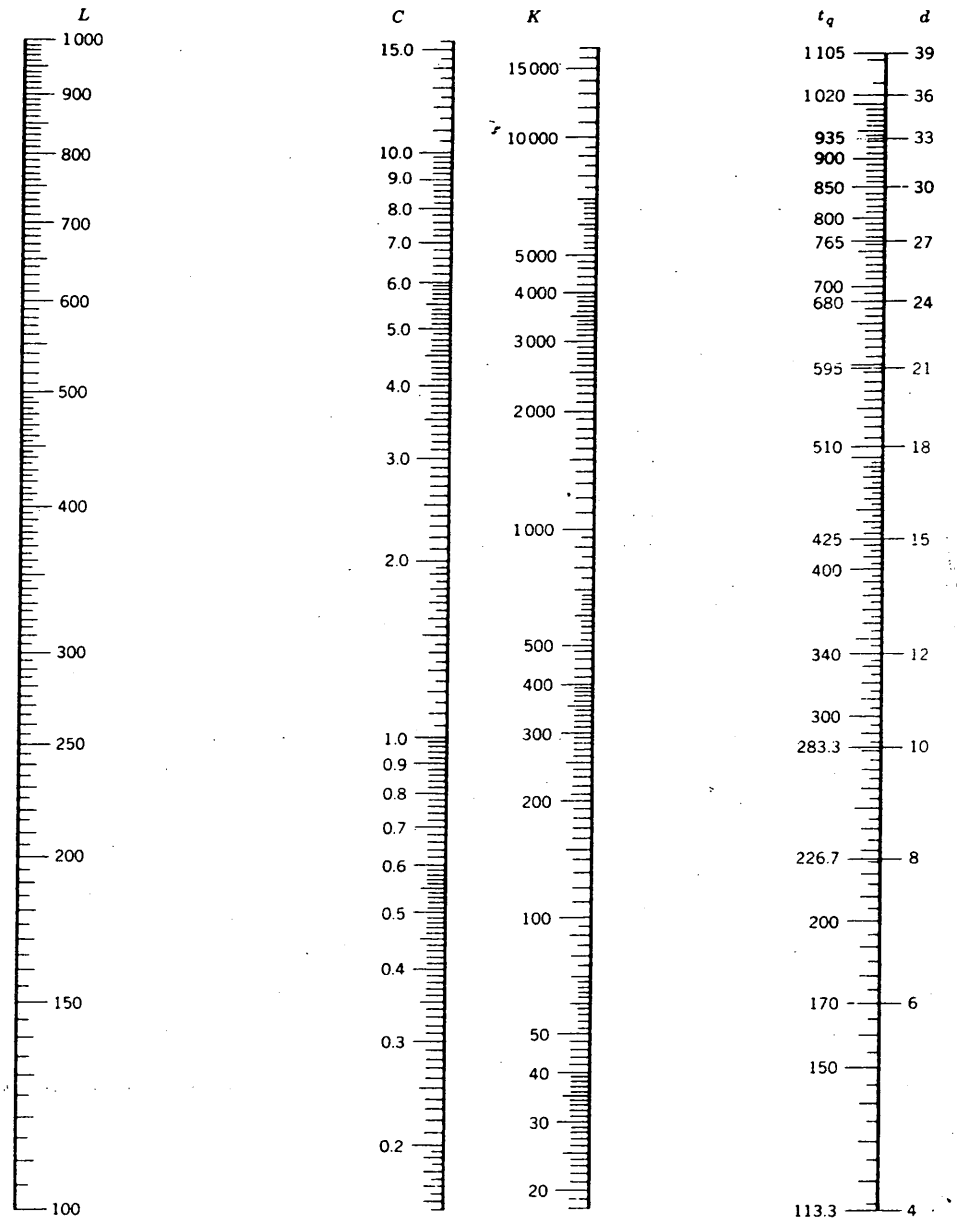


FIG. 13.—NOMOGRAPH FOR THE SOLUTION OF $K = .011d^2L$, $C = .0003882dL$, $t_q = K \div C$

63-2 MATERIALS

2.01 REINFORCED CONCRETE
Reinforced concrete shall consist of portland cement, mineral aggregates and water, in which steel has been embedded in such manner that the stell and concrete act together.

2.01A Cement
Portland cement shall conform to the requirements of the Specificiations for Portland Cement ASTM C150, any type, unless otherwise limited in the special provisions; or it may be air-entraining portland cement conforming to ASTM C175.

2.01B Wire Fabric Reinforcement
Reinforcement shall consist of wire conforming to ASTM A-185.

2.01C Bar Reinforcement
Bar reinforcement shall conform to ASTM A 15, intermediate grade.

2.01D Aggregates
Aggregates shall conform to ASTM C-33, except that the requirement for gradation shall not apply to precast items.

2.01E Mixture
The aggregates shall be so sized, and graded and proportioned and thoroughly mixed in proportions of cement and water as will produce a hemogeneous concrete mixture of such quality that the manhole components will conform to the strength and water-tightness requirements of these specifications. Ad-mixtures or blends may be used with the written permission of the Engineer.

2.03B Mortar

2.03B1 Mortar for Jointing
Mortar for jointing precast manhole sections or masonry manhole units shall be one part portland cement to not less than one part no more than two parts plaster sand, mixed with the least amount of clean water necessary to provide a workable mortar.

2.04 MANHOLE FRAMES

Manhole frames and covers all manhole frames and covers shall be of the size and shape detailed in the standard plans or an approved equal.

Casting shall be tough, close-trained, gray iron free from blow holes, shrinkage and cold sheets. They shall conform to ASTM A 48 and shall be sound, smooth, clean and free from blisters and defects. Castings shall be planed and ground when necessary to insure perfectly flat and true surfaces. Covers shall be true and shall seat within the ring at all points.

2.05 MANHOLE EXTENSIONS

Extensions approximately 4 inches in height will be added to those manholes designated by the Engineer. The actual height of the extnesion shall be as determined by the Engineer. The concrete rings used in those extensions shall be 4 inches in thickness and of standard construction and approved by the Engineer Before purchase.

2.06 PRECAST MANHOLE COMPONENTS

2.06A Base Sections

Base sections for manhole construction shall be either poured in place concrete and be not less than 6 inches in thickness or precast sections conforming to the requirements for precast manhole sections, unless otherwise provided in the plans and special provisions. Base sections shall be constructed to form a watertight structure.

Openings to receive pipe shall be circular, tapered in toward the inside of the section and shall be held to the minimum size possible to accomodate the pipe to be inserted and to effectively seal the joints. Openings for pipe up to 24" diamter may be provided in 42" or 48" base sections. Openings for pipe up to 42" diameter may be provided in 72" base sections. Where pipe of larger diameters are to be accomodated, a monolithic base structure shall be provided.

2.06B PREcast Manhole Sections

Standard precast manhole sections shall conform to ASTM C478 and consist of circular sections in standard nominal diamters. No more than two life holes shall be cast into each section. Holes shall be so located as to not damage reinforcing, or expose it to corrosion. At the manufacturer's option, steel loops may be provided for handling, in lieu of lift holes.

2.06C Precast Cones
Standard precast cones, eccentric or concentric shall conform to ASTM C 478.

2.06D Flat Slab Covers
Flat slab covers shall conform to ASTM C478.

2.07 WORKMANSHIP AND FINISH OF PRECAST SECTIONS
Cones and sections shall be substantially free from fractures, large or deep cracks and surface roughness. Slabs shall be sound and free from gravel pockets. All manhole elements shall be capable of producing a watertight structure when properly assembled and jointed.

2.08 MONOLITHIC CONCRETE MANHOLES
Monolithic concrete manholes shall conform to detailed plans and shall conform to the dimensional requirements specified. Walls and base shall be 6" minimum thickness.

63-3 CONSTRUCTION DETAILS

3.01 FOUNDATION PREPARATION

3.01A DEWATERING
Dewatering of the site shall conform to the requirements for sewer trench dewatering in Section 62-3.04.

3.01B Sub-Base Preparation
Adequate foundation for all manhole structures shall be obtained by removal and replacement of unsuitable material with well graded granular material; or by tightening with coarse ballast rock, or by such other means as provided for foundation preparation of the connected sewers, or as required in the special provisions. Where water is encountered at the site, all cast-in place bases or monolithic structures shall be placed on a one-piece waterproof membrane, so placed as to prevent any movement of water into the frash concrete.

3.02 BEDDING
Precast base sections shall be placed on a well graded granular bedding course conforming to the requirements for sewer bedding but not less than 4 inches in thickness and extending either to the limits of the excavation or to a minimum of 12 inches outside the outside limits of the base section. In the latter case, the balance of the excavated area shall be filled with select material well tamped to the level of the top of the bedding to positively prevent any lateral movement of the bedding when the weight of the manhole is placed upon it. The bedding ourse shall be firmly tamped and made smooth and level to assure uniform contact and support of the precast elements.

3.03 PRECAST MANHOLES

3.03A CONCRETE BASE

The concrete bases for the pre-cast manholes shall be so constructed so as to permit the first section of the pre-cast manhole to have uniform bearing throughout the full circumference of the manhole. wall. Sufficient mortar shall be deposited on the concrete base so as to provide a watertight seal between the base and the manhole wall. The concrete base shall not be placed in water and if the trench foundation is not stable the contractor shall over-excavate one or two feet below invert as per Engineer's direction. The over-excavation shall be brought to grade with gravel.

3.03B MANHOLE INVERT

The invert of the manhole shall conform to details shown on the Plans. Care shall be taken so as to construct the invert of the manhole to provide smooth flo-through characteristics. No sharp edges or rough sections which will tend to obstruct the flow of sewage will be permitted. In general, the invert shall be constructed to a section identical with that of the sewer pipe. Where size of sewer pipe is changed at the manhole, the invert shall be constructed in the form of a smooth tramsition without abrupt breaks or uneveness of invert surfaces. Where a full section of concrete sewer pipe is laid through the manhole, the top shall be broken out to or below the spring line of the pipe, and the exposed edge of the pipe completely covered with mortar. During construction of the invert section, and for a period of not less than 24 hours following placing of concrete or mortar in the invert sections, the Contractor shall temporarily divert existing flows of ground water or sewage from new concrete or mortar surfaces to prevent damage to the fresh concrete or mortar within the manhole until initial set has been achieved.

3.03C MANHOLE WALLS

Manhole Wallls shall be constructed plumb and true in accordance with the details shown on the Plans. Where walls are constructed using precast concrete sections, joints shall be mortared tight, to provide a water-tight joint which will prevent infiltration of ground water into the manholes.

3.03D PIPE CONNECTIONS

All unreinforced pipes entering or leaving the manhole shall be provided with flexible joints within 18 inches of the exterior wall of the manhole structure and shall be placed on firmly compacted bedding, particularly within the area of the manhole excavation which normally is deeper than that of the sewer trench. Special careshall be taken to see that the openings through which pipes enter the structure are completely and firmly rammed full of mortar to ensure watertightness.

3.04 GRADE ADJUSTMENT

Unless otherwise shown on the plans or in the special provisions, grade adjustment shall be as per Section 63. Final elevation for each manhole will be determined by the Engineer, and tilt shall conform to the existing street surface unless otherwise specified or directed by the Engineer.

3.07 CHANNELS

Channels shall be made to conform accurately to the sewer grade and shall be brought together smoothly with well rounded junctions, satisfactory to the Engineer. Channel sides shall be carried up vertically to the crown elevation of the various pipes, and the concrete shelf between channels shall be smoothly finished and warped evenly with slopes to drain.

3.08 BACKFILL

Backfill around the manhole and extending at least one pipe length into each tranch shall be hand placed and tamped with selected native material up to an elevation of six (6) inches above the crown of all entering pipes. Work shall conform to the applicable provions of section 61.

3.09 DROP MANHOLES

Drop manholes, wherever shown on the plans, shall conform in all respects to the requirements for standard manholes of the type or types used on the projects.

63-4 MEASUREMENT

Each manhole will be measured to the nearest one-tenth (0.10) of a foot from invert of the outlet pipe vertically to the top of the casting, for the purpose of determining the amount to be paid per foot in addition to the base price per each for manholes five feet or less in overall depth.

63-5 PAYMENT

Payment for each manhole shall consist of a basic price per each, plus a unit price per foot for all depth in excess of five feet, plus a unit price per each for drop connections where they occur.

Where more than one type or size designation is shown on the drawings or called for in the special provisions, each shallbe covered by a separate bid item of the following form:

Where an existing manhole is encountered in the work and it is required that it must be adjusted to new grade, the work and payment therefor shall be as provided in the specifications.

Where a new manhole that has been set at a grade specified by the Engineer is later required to be adjusted to a revised grade, the work shall be covered by a bid item as follows:

A. "Adjust the Manhole to Grade," per each.
The unit contract prices shall be full compensation for furnishing and constructing manholes complete and connected to the sewers, excepting however, that excavation, backfill, gravel, bedding of foundation material, or additional excavation not shown on the plan will be paid for in accordance with the applicable bid items of other sections.

Section 64 - Catch Basins and Inlets

64 - 1 DESCRIPTION
Standard catch basins and inlets may be constructed of precast units, concrete masonry units, or of concrete or clay brick, or cast-in-place concrete, all in accordance with the standard drawings and specifications; excepting however, that the Contractor's choice of alternates may be limited in the special provisions.

The various types and methods of construction are identified below.

1.01 CATCH BASIN INLET, RECTANGULAR CROSS SECTION
Type 1-A Concrete masonry, or concrete or clay brick.
Type 1 -B Cast-in-place concrete.
Type 1-C Precast concrete.
See standard drawings.

1.02 CATCH BASIN INLET, ROUND BARREL CROSS SECTION
Type II -A Concrete masonry, or concrete or clay brick.
TypeII - B Cast in place concrete.
Type II - C Precast concrete.
See standard drawings.

1.03 COMBINATION CURB AND GUTTER CATCH BASIN INLET
Type III-A Concrete masonry, or concrete or clay brick.
Type III-B Cast in place concrete.
Type III-C Precast concrete
See standard drawings.

1.04 CURB INLET
Type IV - A Concrete masonry, or concrete or blay brick.
Type IV - B Cast in place concrete.
Type IV - C Precast concrete.
See standard drawings.

64 - MATERIALS
Materials for catch basins and inlets shall conform to the applicable provisions of Section 63-2 except as specified in subsections that follow.

2.01 FRAME AND GRATE
The Frame and grate shall conform to the standard drawing No. 46 for catch basin add inlet frame and grate. The frame may be made of cast iron, ASTM A -48 Class 25, cast steel, ASTM A - 27 Grade 70-36, or nodular cast iron, ASTM A - 339, Grade 60-45-10, at the manufacturer's option. The grate may be cast steel or nodular cast iron only, at the manufacturer's option. Other applicable provisions of Section 63-2.08 shall apply.

2.02 TRAPS
Where traps are specified, they shall be constructed in accordance with the standard drawing No. 60 and be of 22 gauge galvanized sheet metal, unless otherwise specified in the special provisions. All joints shall be seamed and soldered, and all longitudinal joints shall be riveted.

2.03 MORTAR
Mortar for jointing catch basins and inlets shall be one part Portland cement and not less than one part nor more than two parts plaster sand, mixed with the least amount of water necessary to provide a workable mortar. Mortar for plaster coating shall conform to Section 63-2.04B.

64 -3 CONSTRUCTION DETAILS
Construction details for catch basins and inlets shall follow all applicable provisons of Section 63-3, Construction Details for Manholes, Sections 63-3.10, Grade Adjustment, and 63-3.12, Pipe Connections, will not be applicable, but shall be replaced by the subsections which follow.

3.01 GRADE ADJUSTMENT
The inlet frame may be either cast into a concrete collar or set flange down on concrete adjustment blocks and mortared, as directed by the Engineer. It shall not, in any case, be grouted to final grade until the final elevation of the pavement, gutter, ditch or sidewalk in which it is to be placed has been established and permission has been given by the Engineer to grout the casting in place.

3.02 PIPE CONNECTIONS
Catch basin bases shall be set so that the invert of the outlet pipe will be not less than 18 inches above the floor of Type I or Type III Catch Basin Inlet, or not less than 24 inches above

the floor of Type II Catch Basin Inlet, and so that a minimum cover of 30 inches is provided where grades permit. The crown elevation of inlet pipes shall be fixed at or above the crown of the outlet pipe. All pipes shall be grouted in place to effect a watertight closure.

3.03 SUBGRADE DRAINAGE OPENINGS

Gankrun gravel or crushed rock shall be packed around the openings in the catch basin inlets to provide uninterrupted drainage from the adjacent roadway subgrade into the catch basin. Where directed by the Engineer, subgrade drainage openings may be omitted or, if existing in precast elements may be grouted full in lieu of placing filter material.

3.04 SEEPAGE STRUCTURE

Catch basin inlets may be specified with perforated side walls, as detailed in the special provisions or supplementary drawings, in lieu of outlet pipes. Where called for, the excavation shall be carefully made so that clean filter material, as described in the special provisions, can be packed around the structure to a thickness of not less than 12 inches at any point and more if specified, and extending up from the base of the structure to not less than 6 inches above the highest perforation. Plugged outlet pipes may be stubbed out for future connection to sewers, where specified.

3.05 TRAPS

Traps shall be installed where shown on the construction plans. Traps shall meet the requirements outlined in Section 64-2.02 and be in accordance with the standard drawing.

64--4 MEASUREMENT

4.01 CATCH BASIN AND INLET

Measurement for payment of all catch basins or inlets of 5 foot depth or less shall be per each. Measurement for payment of all catch basins or inlets more than five feet deep shall be taken to the nearest one-tenth (0.10) foot, from top of grating to inside bottom of catch basin.

64-5 PAYMENT

Payment will be made for such of the following bid items as are included in the proposal:

1. "Type I, 5-foot Catch Basin Inlet," pereach.
2. "Type II 5-foot Catch Basin Inlet," per each.
3. "Type III,5-foot Combination Curb and Curb and Gutter Catch Basin Inlet," per each.
4. Type IV Curb Inlet," per each.
5. "Additional Depth to 5-foot Type ... Catch Basin Inlet," per vertical foot.
6. "Additional Depth to 5-foot Type ... Combination Curb and Curb and Gutter Catch Basin Inlet," per vertical foot.
7. "Catch Basin Trap (size)," per each.
8. "Furnish Metal Frame and Grate for Catch Basin or Inlet," per each.

5.01 CATCH BASIN AND INLET

Catch basins and inlets of each type required will be paid for at the unit contract price bid per each in place, plus the unit contract price per vertical foot for all depth in excess of five feet as defined in Section 64-4.01.

5.02 TRAP

Traps, where required, will be paid for at the unit contract price bid per each in place, for each size required.

5.03 CATCH BASIN INLET FRAME AND GRATE

Catch basin frame and grate casting shall be considered as incidental to the unit contract price for the particular type of catch basin inlet designated in the proposal. Where existing catch basin inlets are encountered and where new castings are to be placed thereon, the cost of furnishing and placing new castings are to be placed thereon, the cost of furnishing and placing new castings will be paid for at the unit contract price per each for "Furnish Metal Frame and Grate for Catch Basin or Inlet."

The unit contract price per each shall include the furnishing of the frame and grate on the job site, and shall be full compensation for materials and all costs incurred in placing the casting.

5.04 ADJUSTMENT OF EXISTING CATCH BASIN AND INLET

Payment for adjustment of existing catch basin and inlet will be made in accordance with Section 53-4.02 when and if the proposal carries and item of "Adjust Existing Catch Basin (or Inlet) to Grade," per each.

Section 65 - Subsurface Drains

65 - 1 DESCRIPTION

This section is intended to cover only the collection and control of subsurface water and does not apply beyond the point at which the water is discharged into the storm sewer or other outlet.

65-2 MATERIALS AND TESTING

2.01 CORRUGATED METAL PIPE

Corrugated metal pipe for underdrains shall meet the requirements of AASHO M 136 as hereinafter supplemented.

2.01A Bituminous Coated Corrugated Metal Pipe

When so specified, corrugated metal pipe shall be bituminous coated. The bituminous material used for coating shall meet the requirements of AASHO M 190.

2.02 CLAY PIPE

Clay pipe shall meet the requirements of ASTM designation C278 for extra strength pipe and shall be perforated in accordance with ASTM Designation C211.

2.03 PERFORATED CONCRETE PIPE
Perforated concrete pipe and fittings shall meet the requirements of ASTM Designation C444.

The class of pipe furnished shall be as specified or as shown on the plans.

Perforated concrete pipe may be either bell and spigot or tongue and groove pattern unless otherwise specified.

2.04 PERFORATED ASBESTOS CEMENT PIPE
Perforated asbestos-cement pipe and fittings shall meet the requirements of AASHO M 189.

2.05 INSPECTION

2.05A Inspection at Factory
If requested in writing by the Engineer, all pipe shall be inspected by the Engineer or his representative at the manufacturer's plant before shipment.

2.05B Disposition of Defective Material
All material found to be defective at time of delivery or at any time during the progress of the work will be rejected by the Engineer. Rejected material shall be promptly removed from the site of the work by the Contractor.

2.05C Material Furnished by Contractor
The ?Contractor shall be responsible for all material furnished by him and shall replace at his own expense any pipe or other material which is found defective.

2.05D Material Furnished By Owner
The Contractor shall inspect all pipe or other materials furnished by the Owner at time of delivery to him, and shall at that time reject any material found defective. Once accepted by the Contractor, any damaged or otherwise defective material found prior to final acceptance of the work shall be replaced at the expense of the Contractor and the cost of all labor, equipment and incidental expense necessary for its replacement and incorporation in the work to the satisfaction of the Engineer shall be borne by the Contractor.

65-3 CONSTRUCTION DETAILS

3.01 EXCAVATION

3.01A General
The trench shall be dug to the required alignment and grade only so far in advance of pipe laying as the Engineer will approve. The clear width of unsheeted or sheeted trench measured at the horizontal diameter of the pipe in place shall be 18 inches or one (1) foot greater than the outside diameter of the pipe, whichever is the greater. Any part of the trench excavated

below grade or to a greater width than specified shall be backfilled at the expense of the Contractor with filter material hereinafter described.

Extreme care shall be excercised by the Contractor at all times during the performance of the work to maintain the trench and excavated material in such condition that there will be no mixing of excavated material with the filter material bo be used for backfilling. All excess excavated material shall be loaded, hauled and deposited at a place designated on the plans or in the specifications.

3.01B PROTECTION OF EXISTING UTILTIES
The Engineer will furnish such information as is available to determine the location of existing utilities that may be affected by the construction. Final responsibility for the definite location of any such existing utilities shall be the sole responsibility of the Contractor and he shall, at his own expense, perform all the necessary work to protect and maintain the services of any utilities affected by his operations. Any damage to an existing utility as a result of the construction operations shall be immediately repaired at the expense of the Contractor, and to the satisfaction of the Engineer.

3.01C BRACED AND SHEETED TRENCH
Wherever necessary, sheeting, bracing, or cribbing shall be provided in accordance with the provisions of Section 61-3.04.

3.02 PIPE LAYING

3.02A General
Pipe laying shall conform to the requirements of Section 62, "Pipe Laying, Jointing and Testing", except as hereinafter supplemented.

3.02B Bedding
Prior to laying any pipe, a 6 inch layer of filter material, as hereinafter described, shall be placed uniformly in the bottom of the tranch. This material shall be placed immediately prior to laying the pipe and shall be uniformly spread to true grade and be properly compacted. Should any of this filter material become contaminated by slough of the trench, by storm water or from other cause, it shall be immediately removed and be replaced with acceptable filter material at the expense of the Contractor.

3.02C Inspection
All pipe shall be inspected prior to lowering into the trench and, if necessary, cleaned of any material tending to plug the perforations of the pipe.

3.02D Lowering Pipe and Fittings into Trench
The Contractor shall have available the proper tools, men and equipment for efficient execution of the work. All pipe and

fittings shall be carefully lowered into the trench to avoid any contamination of the filter bedding material. Pipe or fittings shall not be dumped into the trench. Pipe shall be laid with perforations down, unless otherwise specified or directed by the Engineer.

3.03 PIPE JOINTING

3.03A Corrugated Pipe
Corrugated metal pipe and fittings, if so specified, shall be connected with an approved galvanized band or plastic band provided by the manufacturer.

3.03B Asbestos-Cement Pipe
Asbestos-cement pipe shall be supplied with plain ends or with ends machined for tapered couplings. Couplings furnished shall be of asbestos cement or polyethylene plastic and shall be compatible with the end machining of the pipe furnished. Couplints shall also comply with the requirements of AASHO M 189 Section 5.

3.03C Clay Pipe
Clay pipe joints shall be sealed with a sewer joint compound conforming to the requirements of Federal Specifications No. SS-S -169 for either Type II (coal tar base) or Type III (plastic base, Class I material. There shall be no open joints. Clay pipe joints, if specified, may be cement mortar, hot-pour compounds or bituminous or coat tar base as approved by the Clay Pipe Institute, or factory applied resilient joints per ASTM Designation C425, depending on the service intended.

3.03D Concrete Pipe
Concrete pipe shall be butted up tight and centered so as to provide a continuous and uniform line of pipe with a smooth and regular interior surface. Pipe shall be laid without joint closure unless otherwise provided in the special provisons. Where joint closure is specified, jointing shall conform to the requirements of Section 60-3.08A or Section 62-3.08B, and materials shall conform to the requirements of Section 60-3.02A or Section 60-3.02C except that the dimensional requirements for rubber gaskets and annular spaces shall not apply.

3.04 BACKFILLING WITH FILTER MATERIAL

3.04A Filter Material
Filter material used as backfill shall comply with the following requirements:

GRADING (% by weight)

% Passing 3/4 in. square sieve	100
% Passing $\frac{1}{4}$ in. square sieve	30-60
% Passing No. 8 sieve	20-50
% Passing No. 30 sieve	8-30
% Passing No. 50 sieve	3-12
% Passing No. 200 sieve (wet sieve)	0-1

Filter material shall be crushed or natural granular material and shall contain not more than 1% by weight of clay lumps.

3.04B Placing Filter Material

The filter material shall be damp when placed in the trench and shall be deposited uniformly on both sides of the pipe for the full width of the trench and to the horizontal diameter of the full length of the pipe. The material shall be tamped in 4 inch layers to provide thorough compaction under and on each side of the pipe. Succeeding layers of filter material shall be deposited in 8 inch layers and be thoroughly compacted to the depth shown on the plans, or as specified.

3.05 RESTORATION, FINISHING AND CLEANUP

The Contracto shall restore and/or replace all paved surfaces, curbing, sidewalks, or other disturbed surfaces to their original condition in such manner as to meet the requirements of applicable sections. All surplus material and temporary structures, as well as all excess excavation, shall be removed add the entire site of Contractor operatoons shall be left in a neat and clean condition, as specified in Section 57.

65-4 MEASUREMENT AND PAYMENT

4.01 GENERAL

Except as otherwise specified herein, no direct payment will be made for the various miscellaneous and incidental items of work to be performed, nor for accessories to be furnished and installed. All costs in connection therewith shall be considered as incidental to the construction and shall be included in the unit contract prices of items in the proposal affected thereby.

4.02 PIPE

Pipe of each kind and size shall be measured by the linear foot for the pipe in place and accepted. The unit contract price per linear foot shall be full compensation for the kind and size specified in place, including connecting assessories, all fittings such as elbows, tees, wyes, etc., and the price shall be full compensation for the furnishing of all material, labor and dquipment necessary to complete the pipe laying and jointing as specified, and to the satisfaction of the Engineer.

4.03 EXCAVATION AND BACKFILL

Excavation and backfill shall be measured and compensation be made as provided in Section 61.

4.04 FILTER MATERIAL

Filter material in place will be measured in the trucks at point of delivery, and will be paid for at the unit contract price per cubic yard which shall be full compensation for furnishing the material and placing it in accordance with the specifications, excepting however, that the unit contract price will not include mechanical tamping.

4.05 MECHANICAL TAMPER

The mechanical tamper shall meet the specifications described for it in Section 15-3.01A. Measurement and payment will be to the nearest one-half (½) hour of actual time consumed in compacting. No allowance will be made for time making repairs to the equipment, nor for moving to or from areas on the work for which compaction is required.

Section 66 - Side Sewers

66 - 1 DESCRIPTION

A side sewer is considered to be that portion of a sewer line that will be constructed between a main sewer line amd a residence or other building in which the disposal originates. It does not include any of the internal piping or connecting appurtenances, the installation of which is controlled by a municipal code, ordinance or regulation.

The general requirements for construction of sewers in other sections of these specifications shall apply for side sewers unless they be inconsistent with any of the provisions of this particular section, and the specifications shall apply alike to all side sewers on public rights of way and private property.

66-2 MATERIALS

2.01 PIPE

Approved pipe materials shall be cast iron, concrete, vitrified clay, or asbestos-cement. Pipe materials other than these shall not be used, unless otherwise specified in the special provisions or unless authorized by the Engineer.

Clay, concrete and asbestos-cement pipe shall conform to the requirement of ASTM designations C278,C14 (extra Strength), and C 428, respectively. Cast iron pipe shall conform to federal Specifications WW-P-421A. Class of asbestos-cement pipe shall be as shown on the drawings or designated in the special provisions.

2.02 JOINTS

Approved jointing materials shall be flexible gasketing or lead.

Flexible gasketing shall be construed to include rubber, synthetic rubberlike and plastic materials specially manufactured for the joint, pipe size, and use intended and shall be furnished by the manufacturer of the pipe to be used. Physical properties of the flexible gasketing shall conform to that defined in Section 60.

2.03 FITTINGS

Tees,wyes, bends, couplers, adapters, hubs and transition sections shall conform to the requirements of sections 66-2.01 and 66-2.02.

66-3 CONSTRUCTION DETAILS

3.01 GENERAL

Side sewer construction shall conform to all applicable ordinances or regulations with respect to equipment, methods to be used, protective measures, size of pipe, depth of cover, number of users per pipe, permissible connections, inspection, and testing.

The necessary permits shall be obtained by the Contractor prior to beginning the work of constructing side sewers.

3.02 EXCAVATION AND BACKFILL

Excavation and backfilling for side sewers shall conform to the requirements of Section 61, excepting that no backfill in excess of that required to hold the pipe in true alignment shall be placed prior to the inspection and leakage testing.

No backfill shall be placed for side sewers in excess of that required to hold the pipe in true alignment, prior to inspection and testing.

3.03 PIPE LAYING AND JOINTING

Pipe laying and jointing, except as hereinafter provided, shall in general conform to the requirements of Section 62. During the pipe laying and pointing, the side sewer shall be kept free of any water, dirt or objectionable matter.

3.03A Line and Grade

Pipe shall be laid with a minimum grade of one-fourth inch($\frac{1}{4}$) per linear foot wherever possible. Where this is not possible, the Engineer may authorize the laying of pipe to as little minimum grade as one-eighth inch(1/8) per linear foot, provided extreme care is used in the selection, bedding and jointing of pipe sections and fittings.

The Contractor shall establish such alignment and grade control as is necessary to properly install the side sewer.

3.03B Pipe Laying

Belled pipe shall be laid with the bell end up grade and, in general, all pipe laying shall start and proceed up grade from the point of connection at the public sewer or other starting point. Pipe shall be laid in a straight line at a uniform grade between fittings, or on a uniform horizontal or vertical curvature achieved by deflecting pipe joints within the limits recommended by the manufacturer of the pipe used.

3.03C Jointing

Jointing for cast iron side sewers shall be by means of approved flexible gaskets or caulked lead. For other kinds of pipe the jointing, including jointing for adapters, shall be by means of approved flexible gaskets.

3.04 FITTINGS

All fittings shall be factory-produced and shall be designed for installation on the pipe to be used. Fittings shall be of the same quality and material as the pipe used except that tees, wyes, amd bends for use with asbestos-cement pipe may be cast irom.

The maximum deflection permissible at any one fitting shall not exceed 45 degrees (45) (one-eighth (1/8) bend). The maximum deflection of any combination of two adjacent fittings shall not exceed 45 degrees (45) (one-eighth (1/8) bend) unless straight pipe of not less than two and one-half (2½) feet in length be installed between such adjacent fittings, or unless one of such fittings be a wye branch with a cleanout provided on the straight leg.

Side sewers shall be connected to the tee, wye, or riser provided in the public sewer where such is available, utilizing approved fittings or adapters. Where no tee, wye, or riser is provided or available, conmection shall be made by machine-made tap and suitable saddle, or otherwise as approved by the Engineer.

3.05 CLEANOUTS

Not less than one cleanout shall be provided for each side sewer and/or each total change of 90 degrees (90) of grade or alignment, except that no cleanout will be required at the connection of the side sewer to a riser on the public sewer. A suitably located cleanout in the house piping or plumbing may be considered as a cleanout for the side sewer.

Cleanouts shall be placed at intervals of not more than 100 feet in stright runs. Cleanouts in the line shall utilize a wye branch at the side sewer.

The Extension of house sewer cleanouts to grade will be optional with the home owner. When installed to grade, cleanouts shall be full side sewer diameter and shall be extended to a point not less than six (6) inches nor more than twelve (12) inches below the finished ground surface and shall be plugged with a removable stopper which will prevent passage of dirt or water. When specified, the Contractor shall install an approved casting to provide ready access to the cleanout stopper. A one-eighth (1/8) bend shall be used to deflect the side sewer upward as a cleanout where the terminal end of the side sewer lies upstream from the last point of connection.

3.06 INSPECTION AND TESTING

3.06A INSPECTION

Side sewers shall meet the inspection and leakage requirements specified in Section 62, except as noted for backfill in Section 66-3.02.

Unless otherwise specified, all side sewers shall be tested for leakage in the presence of the inspector, and all arrangements and materials for testing shall be ready prior to the Contractor's request for inspection . For exfiltration testing the inspector may require the rmmoval of any backfill or bedding material which obscures his view of the pipe and for this purpose adequate blocking shall be available to place at deflection fittings.

3.06B Testing
For test purposes, a tee fitting in which a suitable stopper may be placed, may be located as close as practicable to the public sewer and an additional tee fitting shall be located near the property line. The Contractor shall place a suitable stopper in the line immediately before leakage tests are started.

After acceptable testing of the side sewer, the leakage test stopper shall be removed and the tee opening closed with a fastened in place approved stopper which will not project into the side sewer.

3.07 MISCELLANEOUS REQUIREMENTS

3.07A Requirements
1. Pipe and Connections. Side sewer shall be not less than four inches (4) in diameter. No roof drain, or subsurface drain shall be connected to a sanitary side sewer.

2. Minimum Cover. The minimum cover above the pipe for side sewers located in public right of way or driveways shall be four and one-half (4½) feet. On private property in areas not subject to vehicular use, the minimum cover may be reduced to two (2) feet.

3. Proximity to Water Supply Lines. Any side sewer which at any point will lie within ten (10) feet of a water wupply line shall be constructed so that it will be at least six (6) inches in elevation below the water supply line. If this requirement will prohibit a connection of the side sewer, the Contractor shall proceed under such method and with such materials as the municipal water agency may require and as the Engineer, acting for the water agency, shall direct.

4. Plugs. Any unused openings to the side sewer shall be closed with a watertight stopper fastened in place.

5. Septic Tanks and Cesspools. No side sewer shall be con= structed through or adjacent to an existing cesspool or septic tank. If the conditions prohibit any other location, the Contractor shall abate the cesspool or septic tank by such means as the Engineer may direct, and by such payment as may be specified or agreed upon.

3.08 RESTORATION, FINISHING AND CLEANUP
The Contractor shall restore and/or place all paved surfaces, curbing, sidewalks, or other disturbed surfaces to their original condition in such manner as to meet the requirements of applicable sections. All surplus material and temporary structures, as well as excess excavation shall be removed and the entire site of contractor operations shall be left in a neat and clean condition, as specified in Section 57.

66-4 MEASUREMENT
Measurement shall be along the pipe from the outside surface of the main sewer to the extreme end of the last pipe or fitting placed, through tees, wyes, and other fittings; and from the center of the side sewer along the center line of any branch to the extreme end of the last pipe or fitting placed, through tees, wyes or other fittings. Plugged wyes or tees shall not be considered branches. Measurement shall be to the nearest one-tenth (o.1) foot.

66-5 PAYMENT
Payment for wyes, tees, and eighth bends shall be at the unit contract price per each. Couplings or adaptors to house plumbing or to wye or tee stubs on the main or elsewhere, and plugs shall be considered as incidental to the construction and all costs thereof shall be included in other pay items of the proposal.

Payment for cut-in connections to main sewers where no wye or tee stub exists shall be per each, and the unit contract price shall include all labor and materials required.

Payment for cleanout surface box castings shall be per each, and shall include all material and labor required.

Excavation, backfill, bedding gravel, testing, cleanup, and restoration shall be considered as incidentals to the construction of the side sewer and the costs thereof shall be included in the unit contract prices of various pay items in the proposal.

Section 67 - Pipe Covering and Embankment for Sewer Construction

67 - 1 DESCRIPTION
This section of the specification applies to the construction of pipe covering and embankment. Pipe covering shall be constructed where the invert of the pipe is so shallow that placing of earth over the pipe becomes necessary to provide a minimum depth of cover. Pipe cover and embankment shall be constructed where the invert of the pipe is above existing ground and it becomes necessary to construct an embankment upon which the pipe and pipe covering is to be placed. The embankment and cover shall be constructed to lines shown on the standard drawing No. 61.

67 - 2 CONSTRUCTION DETAILS

2.01 PIPE BED
The area upon which the embankment for the pipe bed is to be placed shall be stripped to the extent the Engineer directs, and the cost thereof will be paid for by force account as defined in Section 9.04.

The embankment upon which the pipe is to be installed shall be constructed in accordance with requirements outlined in Section 13-3.10E3 Method B, up to a point equal to the spring line of the pipe. The material used in constructing the embankment shall be such that it will readily compact to required density. The Contractor may use any type of compacting equipment he wishes provided the required end result is obtained, and provided no damage occurs to surface or subsurface improvements.

2.02 PIPE COVER
The pipe cover material above the compacted embankment shall be placed without compaction, and shall be shaped to the required section.

2.03 SOURCE OF MATERIAL
The source of material shall be that which is specified in the dpecial provisions.

67-3 MEASUREMENT
Measurement will be by the cubic yard as calculated from cross sections based on elevations of the ground surface and the neat lines of the section conforming to standard drawing No. 61, from which will be deducted the volume in cubic yards displaced by the pipe.

67-4 PAYMENT
Payment will be made at the unit contract price per cubic yard for "Pipe Covering and Embankment," which price shall be full compensation for furnishing all labor, equipment, and materials necessary to construct and compact the embankment and cover as specified to the satisfaction of the Engineer.

Section 68 --Finishing and Cleanup for Underground Conduits

68-1 CLEANUP

Before acceptance of sewer line construction, all pipes, manholes, catch basins, and other appurtenances shall be cleaned of all debris and foreign material.

After all backfill has been completed, the ground surface shall be shaped to conform to the contour of adjacent surfaces. General cleanup of the entire consturction area shall otherwise conform to applicable requirements specified in Section 57.

Section 101 - Creek Crossing

101-1 SCOPE

This section covers all work necessary to construct gravity sewer lines across a creek, within the limits indicated. See standard detail.

101-2 MATERIALS

2.1 Excavation and Backfill

Conform to sections on TRENCH EXCAVATION AND BACKFILL.

2.2 Rock for Erosion Protection

The top 12 inches of the backfill shall be 6 inch minus pit-run gravel or crushed rock, reasonably evenly graded from coarse to fine. Submit samples to Engineer for approval.

2.3 Concrete for Pipe Encasement

Concrete shall be 2,000 PSI at 28 days, with a minimum of 4½ sacks of cement per cubic yard. Encasement shall extend 2 feet on either side of joint.

2.4 Gravity Sewer Pipe.

Pipe used in creek crossings shall be ASTM C-14 Extra strength concrete.

101-3 WORKMANSHIP

3.1 Creek Diversion

Water in the creek may be diverted; however, flow shall not be interrupted. Engineer's approval of plan for diverson will not relieve the Contractor from responsibility for maintaining flow at all times and for adequate protection of all work and existing structures.

3.2 Rock for Erosion Protection

Provide erosion rock from bank to bank for a minimum depth of 12 inches and a width of one foot beyond the disturbed channel on each side. Rock may be machine placed, but hand placing of the upper exposed surfaces may be required, as directed by the Engineer, to insure a "Keyed" rock surface to adequately resist erosion effects of water. Finished surface shall conform to original cross section.

3.3 Cleanup

After completion of each crossing, reshape all existing channels and ditches, remove all excess materials and construction debris, and restore area to equivalent of its original condition or better.

101-4 PAYMENT

Payment for creek crossings will be based on the linear foot price set forth in the Contractor's Proposal and shall include all work and materials (including pipe) necessary to construct the crossing between the limits shown.

Section 102 - Cleanup and Site Restoration

102-1 SCOPE

This section covers all work necessary to ensure adequate restoration of construction site and other areas used by the Contractor.

102-2 MATERIALS

Seed, sod, fertilizer and other materials used in site restoration shall be of a type recommended by the Engineer.

Any trees, designated by the Engineer as special or historic trees, damaged or destroyed by the Contractor, shall be replaced in kind and value at the Contractor's expense.

102-3 WORKMANSHIP

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.

During construction, handle 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; leave these surfaces in a condition equivalent to their original condition and free from all rocks, gravel bolders, or other foreign material.

Any damage to grassed or planted areas shall be the responsibility of the Contractor.

Any damage to special or historic trees shall be the responsibility of the Contractor.

Construction areas shall be seeded with first-quality seed approved by the Engineer. All ground preparation and reseeding shall be done in accordance with the best accepted practices for lawn planting. The Contractor shall be responsible for obtaining a satisfactory grass turf acceptable to the property owner. Lawn may be restored by sodding if approved by the property owner.

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 cleaned 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.

3.1 Street Cleanup During Construction

Clean all spilled dirt, gravel or other foreign material caused by the construction operations from all streets and roads outside the project area at the conclusion of each day's operation.

3.2 Dust Prevention

Give all streets, roads, or detours used for hauling material to or from the construction area an oil dust preventive treatment or continually water to prevent dust.

Dust prevention measures shall be continuous until final acceptance by the Owner.

3.3 Street Cleaning. Within 5 days after completion of all paving on any block, move all dirt, mud, rock, gravel, and other foreign material from the paved surface.

3.4 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 effect 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.

3.5 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 damaged facility at no additional cost to the Owner.

102-4 PAYMENT

The work specified in this section shall be considered incidental to the project cost, and the expense shall be included in the lump sum bid or unit price bids, as applicable.

Section 104 - Creek Diversion

104-1 SCOPE

This section covers all work and materials necessary in connection with creek diversions.

104-2 MATERIALS

2.1 Rock for Erosion Protection

Pit-run rock reasonably even graded from coarse to fine. Sumbit samples to the Engineer for approval.

104-3 WORKMANSHIP

3.1 Grade and Allignment

The diversion shall be graded so as to provide an even grade between the inverts of the old channel on the downstream and upstream ends. Allignment shall be designated by the Engineer.

3.2 Cross-section

The cross-section of the Creek diversion shall be as shown on the Detail Drawings.

3.3 Erosion Protection

In places where there is a possibility of erosion such as bends and near previously disturbed earth the Engineer may require a blanket of pit-run rock placed along the side of the channel. The material shall be machine placed so as to achieve a 1 1/2:1 slope with no rock projecting into the channel.

104-4 PAYMENT

Payment for Creek Diversions shall be made on a per linear foot basis as set forth in the Proposal and shall include all work necessary to construct the diversion.

Payment for erosion protection shall be made on a per yard^3 basis as set forth in the Proposal and shall include all work and materials to connectedwwith erosion protection

SPECIAL SPECIFICATIONS

Section 105 - Grade

The Engineer shall furnish offset stakes at each angle point or manhole stating the station and cut to invert.
It is the responsibility of the Contractor to furnish grade between these points.

Section 106 - Water Settlement

106-1 Scope

This section covers all work and materials necessary to provide water settlement.

106-2 Material

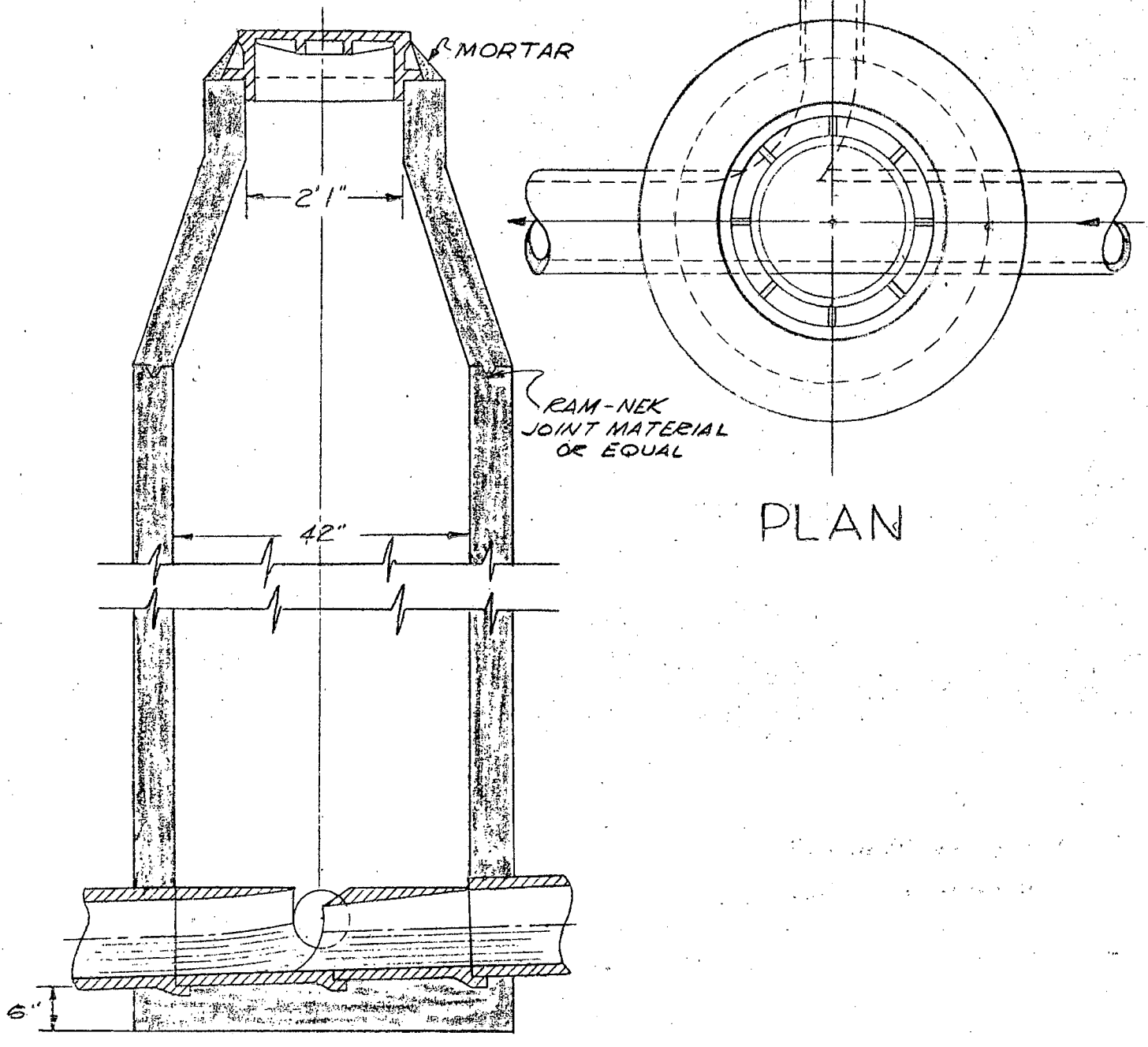
Water shall be provided by the Contractor in sufficient quantities to ensure complete settlement.

106-3 Workmanship

The Contractor is responsible to determine the correct procedures and provide sufficient quantities of water to effect complete water settlement of the back filled material. Any subsequent settlement of the trench or ditch during the quarantee period shall be considered to be the result of improper water settlement and shall be corrected at no expense to the Owner.

106-4 Payment

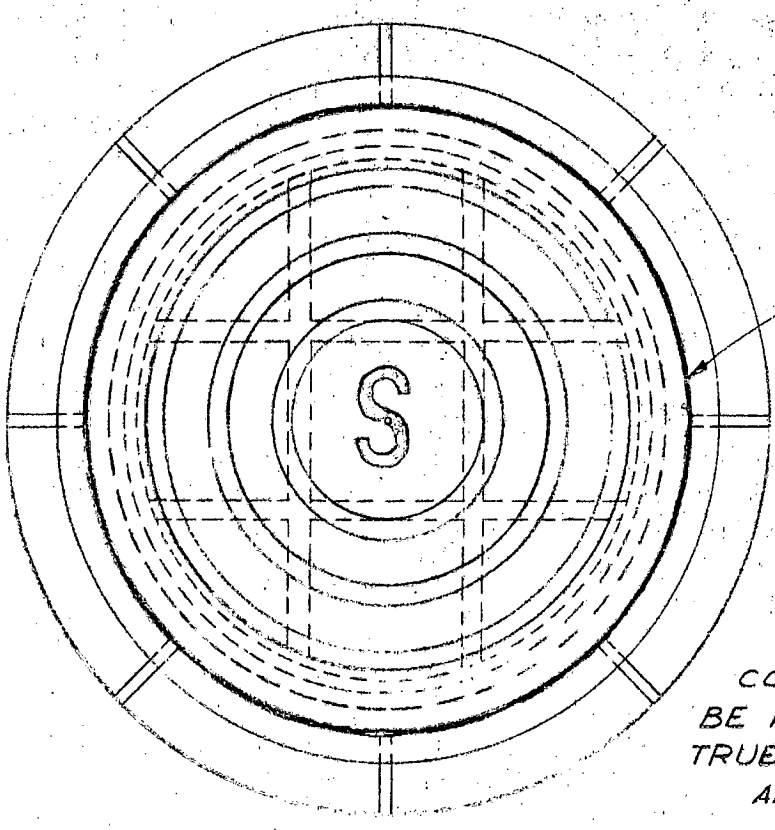
Payment for water settlement shall be on a per linear foot basis as set forth in the Proposal and shall include all work and materials necessary as described.



PLAN

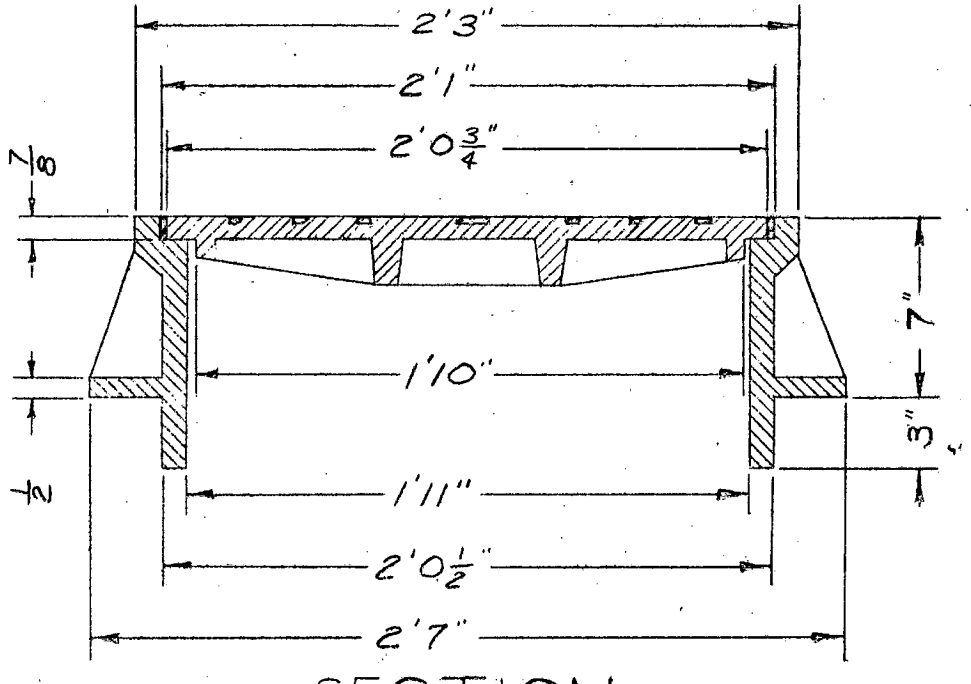
SECTION

MANHOLE DETAILS



COVER & FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND

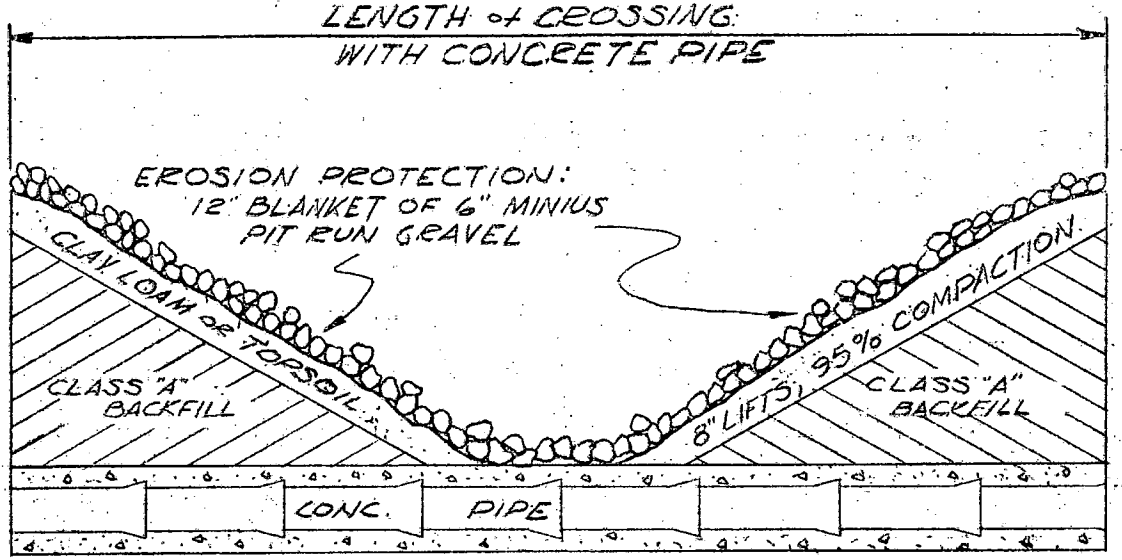
PLAN

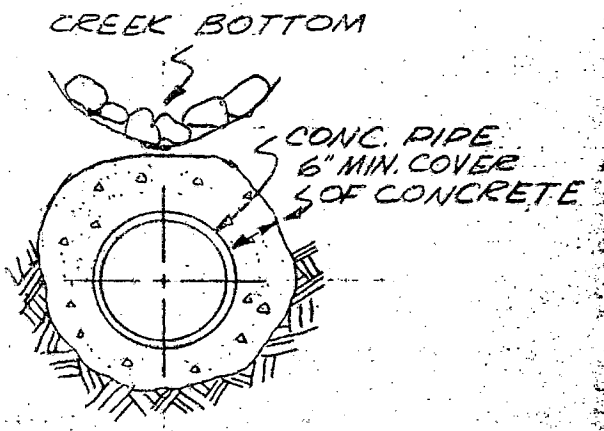


SECTION

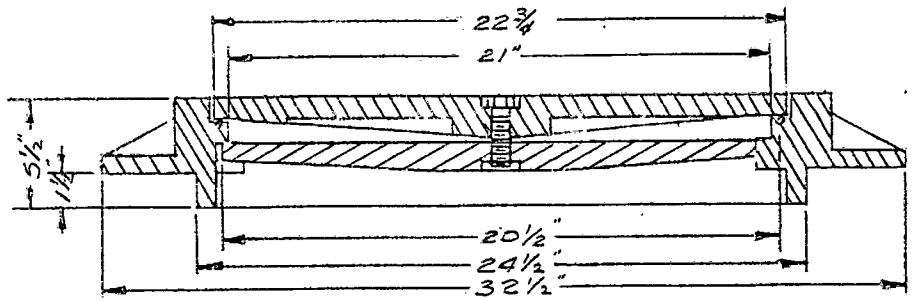
MANHOLE FRAME & COVER

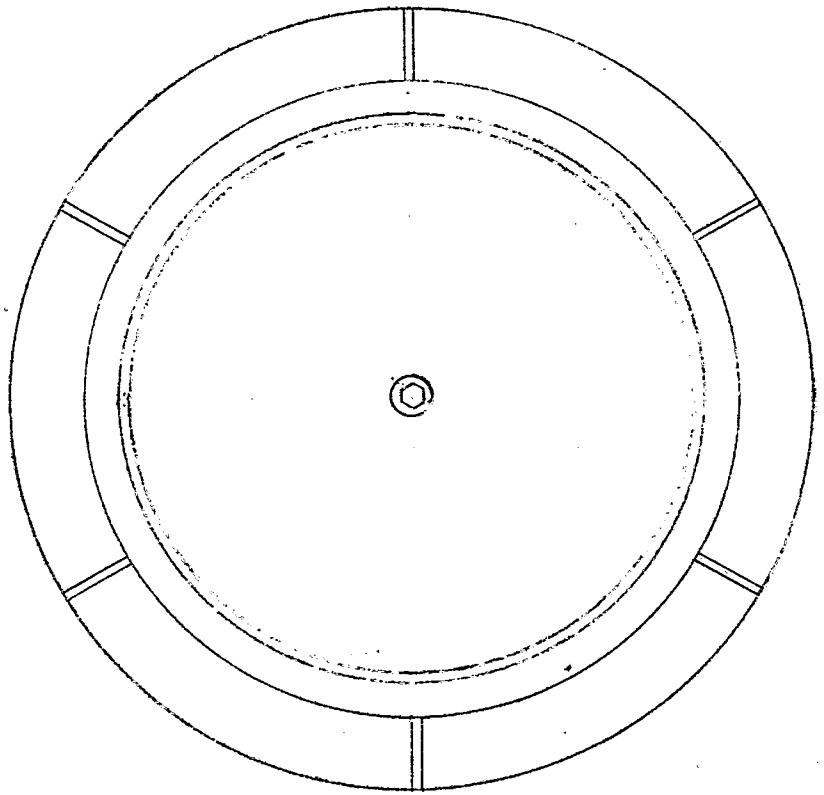
SCALE 1 1/2" = 1'-0"



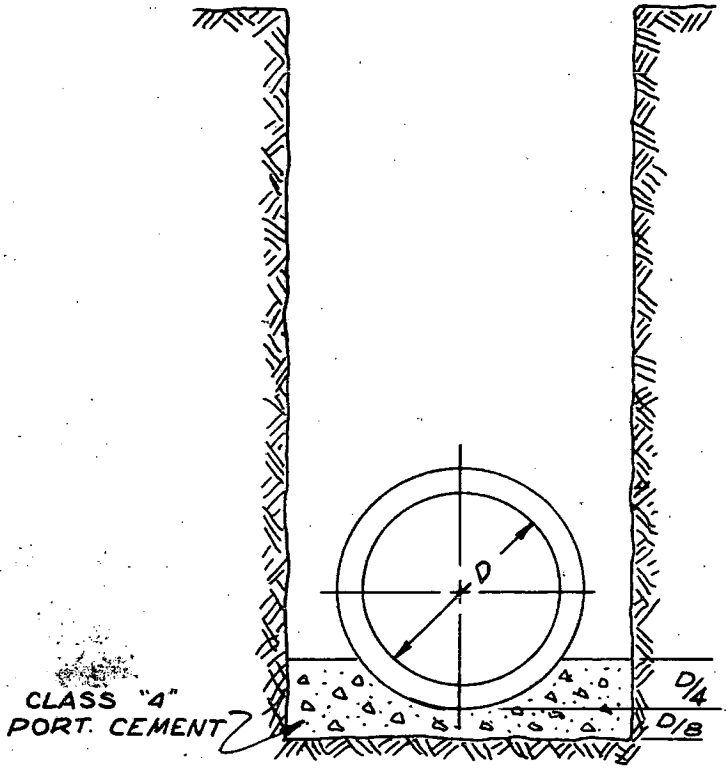


TYPICAL CREEK CROSSING

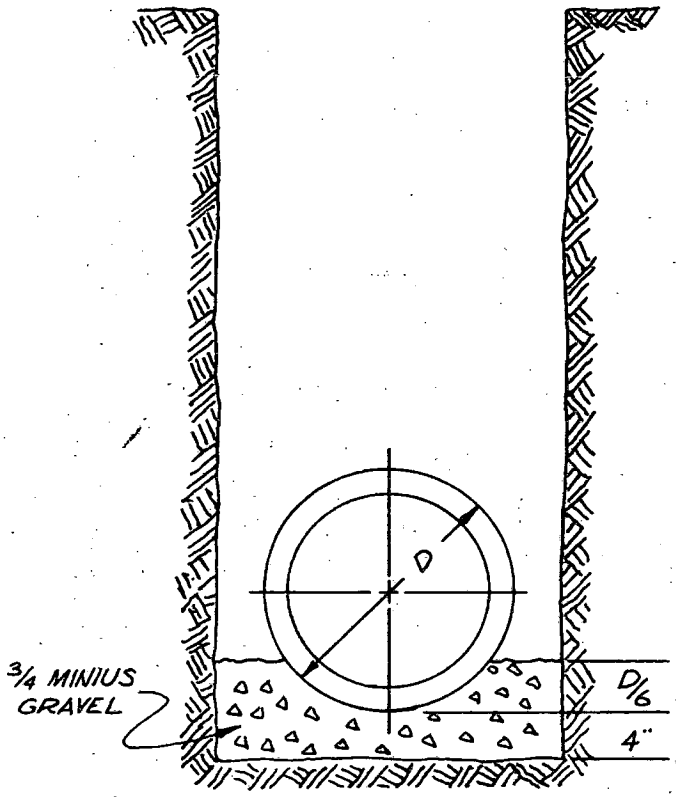




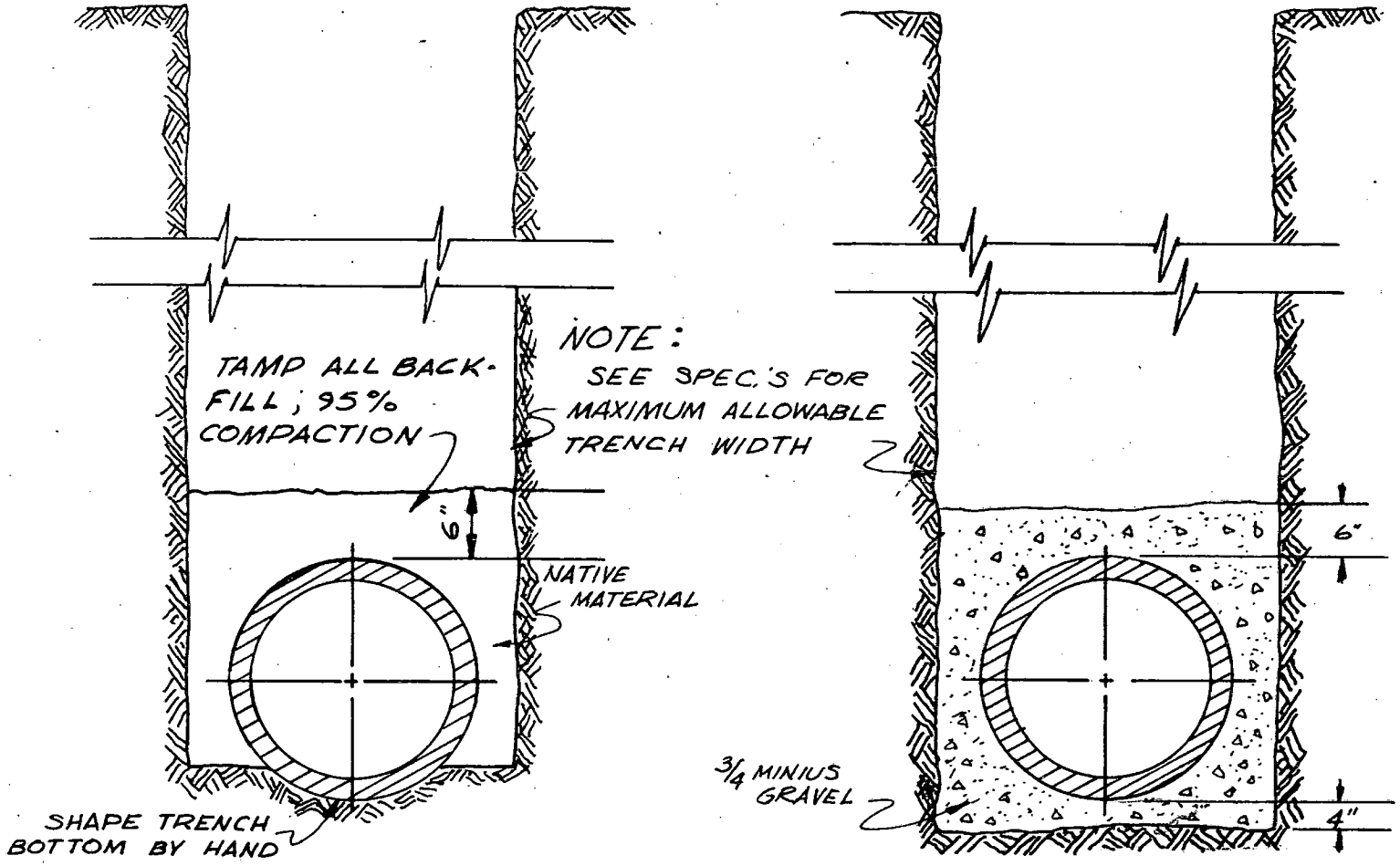
WATERTIGHT MANHOLE COVER



CLASS "A" BEDDING

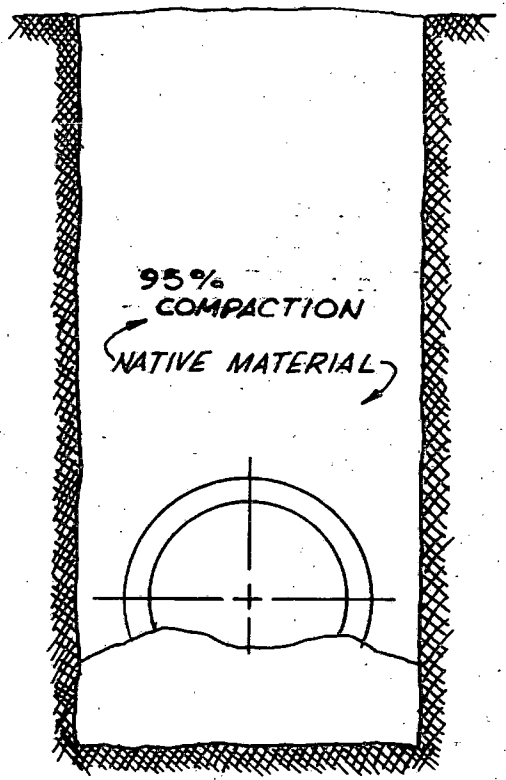


CLASS "C" BEDDING

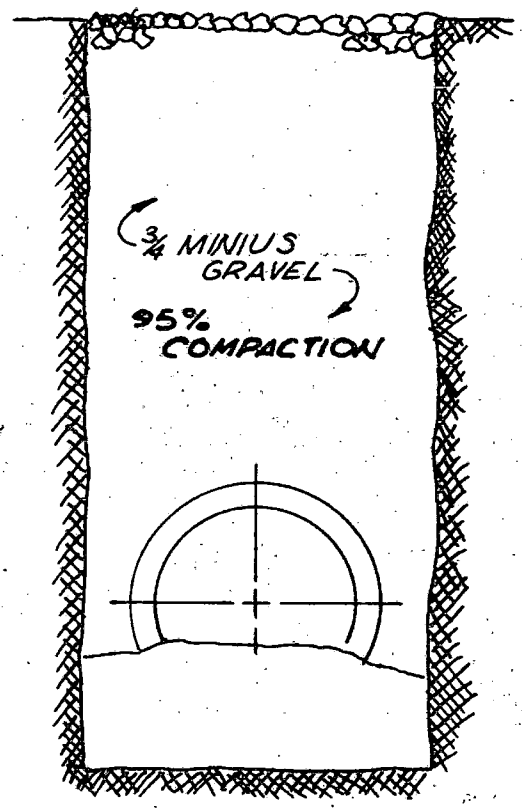


CLASS "D" BEDDING

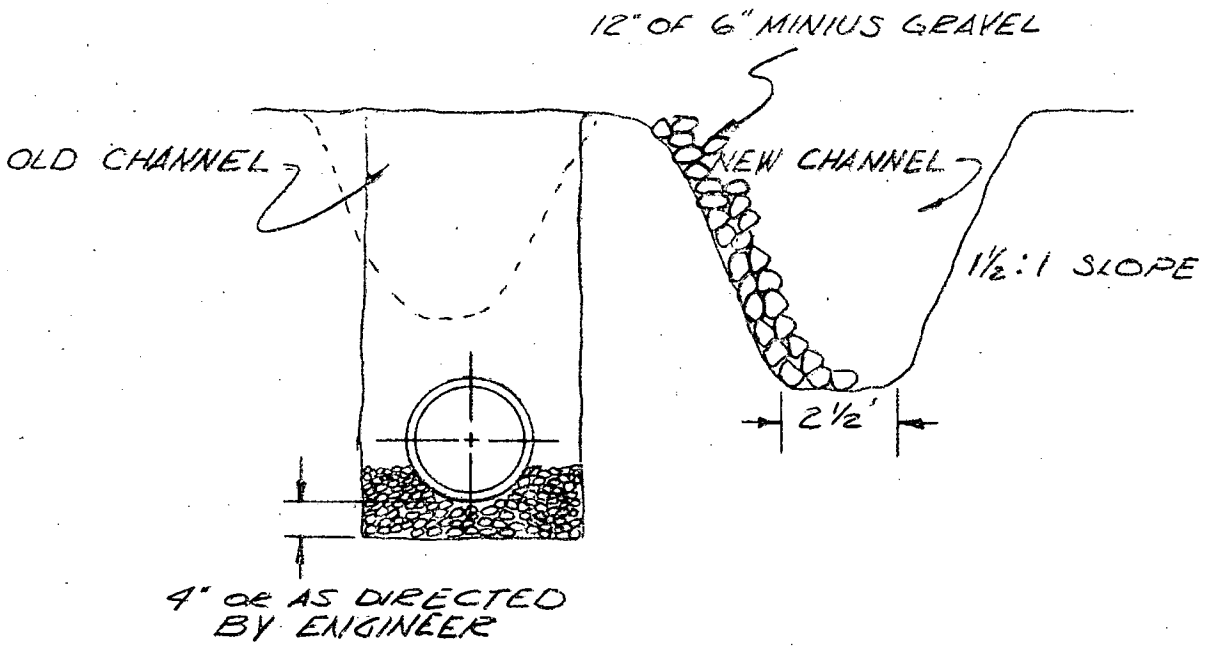
CLASS "B" BEDDING



CLASS "A" BACKFILL



CLASS "B" BACKFILL



BANK PROTECTION

CERTIFICATE OF INSURANCE

☒ UNIGARD MUTUAL INSURANCE COMPANY
☐ UNIGARD SECURITY INSURANCE COMPANY
☐ UNIGARD INSURANCE COMPANY
☐ UNIGARD JAMESTOWN MUTUAL INSURANCE COMPANY

Unigard Insurance Group

Date August 10 19 73

THIS IS TO CERTIFY that the Insured named in the following schedule is at this date insured with the company(ies) shown above under the policy(ies) described in the following schedule affording coverage for the liability as imposed by law upon the Insured for damages, as defined in the policy(ies), and subject to the terms and conditions of said policy(ies.)

This Certificate of Insurance neither affirmatively or negatively amends, extends or alters the coverage afforded by the Policy(ies) listed and issued by the company(ies) indicated above.

SCHEDULE

Named Insured and Address: Law & Sons, Inc.
9300 N. E. Halsey
Portland, Oregon

Certificate Holder Name and Address: City of Newberg
Newberg
Oregon

Kind of Insurance	Policy Number	Policy Period	LIMITS OF LIABILITY		
			Bodily Injury	Property Damage	Single Limit
Comprehensive Liability Including Automobile	MC00-9341	Eff. 10/15/72 Exp. 10/15/75	$200/500,000	$200,000.	
Comprehensive Liability Excluding Automobile		Eff. Exp.			
Comprehensive Automobile Liability		Eff. Exp.			
Manufacturers' and Contractors' Liability		Eff. Exp.			
Owners', Landlords' and Tenants' Liability		Eff. Exp.			
Contractual Liability		Eff. Exp.			
Automobile Liability ☐ Owned Automobiles ☐ Hired Automobiles ☐ Non-Owned Automobiles		Eff. Exp.			
Other:		Eff. Exp.			
Workmen's Compensation		Eff. Exp.	Coverage A Statutory	$	Coverage B Employers' Liability ,000 each accident

DESCRIPTION OF OPERATIONS

Tendays notice in writing will be given to the Certificate Holder in the event of cancellation.

As respects work being done at Newberg, Oregon

UNIGARD MUTUAL INSURANCE COMPANY
UNIGARD INSURANCE COMPANY
UNIGARD SECURITY INSURANCE COMPANY

Daniel J. Jacques — SECRETARY
Robert Hitchman — PRESIDENT

UNIGARD JAMESTOWN MUTUAL INSURANCE COMPANY

S. O. Peterson — SECRETARY
Robert Hitchman — PRESIDENT

COUNTERSIGNED AT	DATE (MO. DAY YR.)	AGENT
Portland, Oregon	8/10/73	Lawrence T. Usher

2144 EDITION 2-68
(872 PRINTED IN U.S.A.)

Ps

FORM No. 941—Civil Subpena—Circuit Court—Issued by Attorney STEVENS-NESS LAW PUB., CO., PORTLAND, OR. 97204

SN

In the Circuit Court of the State of Oregon

FOR THE COUNTY OF MULTNOMAH

MAURICE MONTGOMERY, *Plaintiff,*

vs.

WADSWORTH PLUMBING AND HEATING CO dba LAW & SONS *Defendant.*

Case No. 405 950

CIVIL SUBPENA*

DUCES TECUM

TO: John Rainieri

IN THE NAME OF THE STATE OF OREGON:

You hereby are required to appear in the Circuit Court of the State of Oregon for the County of Multnomah, *at Room No.* 236 *of the County Court House of said county in the City of* Portland, *Oregon, on the* 18th *day of* November, *19* 75, *at* 1:30 *o'clock* P *M., to testify as a witness in the above entitled cause on behalf of* plaintiff and bring with you all records concerning performance of a certain utilities contract in 1973 betweenLaw & Sons and City of Newberg.

s/Graham Walker

Attorney of record of the party to the above action, suit or proceeding in whose behalf the witness is required to appear.

Address 10340 NE Weidler, Portland, Oregon 97220 *Phone* 255-4557

I hereby certify that the foregoing is a true copy of the original subpena in the above entitled cause as the same appears in my hands for service.

Graham Walker

If an officer, state title.

Proof of service made by person other than sheriff.

STATE OF OREGON, County of ..... *ss:*

I, ..., *being first duly sworn, depose and say that the within subpena was delivered to me for service on* ....., *19*.....; *that I served the same within the county and state aforesaid on the* .....*day of* ....., *19*.....*on the within named* ..... *by delivering to him personally a copy thereof and giving or offering to him at the same time the fees (named below) to which he is entitled for travel to and from the place designated in said subpena and one day's attendance: that I am a competent person over the age of 18 years.*

.....

Subscribed and sworn to before me this .....*day of* ....., *19*.....

.....

Notary Public for Oregon

(SEAL)

My Commission expires .....

Proof of service if made by sheriff.

STATE OF OREGON, County of ..... *ss:*

I hereby certify that the within subpena was delivered to me for service on ....., *19*.....; *that I served the same within the county and state aforesaid on the* .....*day of* ....., *19*....., *on the within named* ..... *by delivering to him a copy thereof personally and giving or offering to him at the same time the fees and mileage (named below) to which he is entitled for travel to and from the place designated in said subpena and one day's attendance.*

.....

Sheriff of .....*County, Oregon*

By .....*Deputy*

Witness fees . . . . . $.....

Mileage . . . . . $.....

Paid by . . . . . $.....

For Civil Subpena issued by clerk, see S-N Form No. 255.

* (Statutory spelling, Laws 1969 ch. 383 amending ORS 44.110).