

1914

Specifications

FOR

SANITARY SEWER SYSTEM

FOR

PINE CITY, MINN.

Oscar Claussen Engineering Company,

Consulting Engineers,

ENGINEERING EXPERTS TO MUNICIPALITIES,

St. Paul,

Minnesota.

C O N T R A C T

for the

Installation of a Complete Sewer System with

Storm Water Connection

for the

Village of Pine City, Pine County, Minn.

ARTICLES OF AGREEMENT made and entered into this 28th day of October, 1914, between the Village of Pine City, Pine County, Minnesota, hereinafter called the party of the first part, and Rogers & McLean, 423 Lyceum Bldg., Duluth, Minn., parties of the second part, hereinafter called the Contractors, do hereby for themselves covenant, promise and agree to and with said Village of Pine City, Pine County, Minn. for and in consideration of the payments to be made as hereinafter mentioned, furnish and install complete in a good, substantial, expeditious and workmanlike manner, the Sewer System including Y connections, and the building of all manholes, flush tanks, lamp-holes, catch-basins, etc. comprising the complete Sewer System and outlet called for on Plans and in Specifications, which Plans and Specifications are subject to additions or deductions at the price named upon the proposal. Changes of grade are to be made as directed and allowances on the contract price are to be made for same. If changes are not made in the grades of sewers an equal amount of labor and material will be required to be furnished under this contract as called for on Plans and in Specifications, but ~~no~~ additions ~~and deductions~~ will be made for any amounts over and above

that called for in the original proposition.

The contract calls for the furnishing of all labor and material and everything of every sort entering into the construction of the complete sewer system as outlined with lengths of run manholes, lamp-holes, flush-tanks, and catch-basins specified in the original bill of material, these together with all accessories are to be furnished and installed complete with the exception of the portions subject to ~~the~~ revision at the option of the Council and Engineer. All of the above is to be agreeable to the plans, specifications and drawings hereto attached which includes specifications pages #1 to #23 inclusive and the accompanying plans.

Rock excavation to be determined by the Engineer and Council and to be paid for if encountered at the rate of \$6.00 per cubic yard.

The Plans, Specifications and proposal as stated above are hereby made a part of this contract and by the signing hereof the contractors agree and hereby declare that said plans and specifications are sufficient to their intended purpose and said contractors hereby agree at their own cost and expense to provide all labor and material and everything of every sort which may be necessary for the proper execution of the work included in this contract and in the proposal hereto attached according to the true intent and meaning of this contract, plans, specifications and the proposal hereto attached. Said Village of Pine City, Pine County, Minnesota, its successors and assigns covenants, promises and agrees to and with said contractors to pay or cause to be paid to said contractors or their legal representatives for the full and faithful performance of each and every one of the stipulations contained in this contract

and the specifications attached hereto, the sum of five thousand seven hundred and eighty-eight (\$5,788.00) dollars, lawful money of the United States, but due allowance is to be made for subsequent additions, deductions and alterations (at a price to be agreed upon in writing) if not provided for in this contract and the specifications attached hereto.

Payments are to be made within ten (10) days after the expiration of each calendar month or as near as possible within this period of ten (10) days as shown by estimates approved by the Village of Pine City, Pine County, Minn., which estimates shall not exceed 85% of the work done or material furnished during the previous month provided said work and material is in accordance with said plans and specifications.

The last and final estimate shall include the 15% retained out of each monthly estimate as above mentioned, and is to be made within fifteen (15) days after the final completion of the work by the contractors and the acceptance of same by the Village of Pine City, Minnesota.

It is further understood and agreed that if after final estimate is made it develops that any work or material required according to this contract and proposal attached hereto and the plans and specifications have been omitted or not properly executed, said final payment shall not exempt said contractor from liability to replace or execute said work according to this contract and the proposal and plans and specifications.

It is further understood and agreed that said contractors are to give a bond in form satisfactory to the Village of Pine City, Minnesota, covering every clause and condition mentioned in the

specifications in the penal sum of five thousand seven hundred and eighty-eight (\$5,788.00) dollars conditioned for the faithful performance of this contract with surety satisfactory to the Village of Pine City, Pine County, Minnesota, and this contract shall not be binding upon the part of said Village until said bond is accepted and said contract signed by the executive officers of the said Village of Pine City, Pine County, Minnesota.

It is further mutually and expressly understood and agreed that under no circumstances or in any event is any allowance or payment to be made for extra work, for material furnished or labor done unless said work and material are ordered by said Village or its legal representatives in writing and an agreement fixing the price of said work and material is duly entered into in writing by the parties hereto.

It is further mutually and expressly understood and agreed that the entire installation shall be completed by December 30th, 1914.

It is further mutually and expressly understood and agreed that the contractors are to pay the Village of Pine City, Minnesota, as liquidated damages, the sum of ten (\$10.00) dollars per day in case of non-completion of contract by December 30th, 1914.

Said contractors agree to pay all claims for labor performed and material used in and about the performance of this contract and that no liens shall be served against the property of the Village of Pine City, Pine County, Minnesota, for or on account of any labor performed or material furnished under or in pursuance of the terms hereof and the bond shall be conditioned to fulfill the terms of the contract.

Note: Owing to slight changes in the grade of sewers and to the change of route demanded by the Council it will be necessary to run new lines; however, the following depths and sizes of sewer taken from profiles bid upon will govern the extent of this work and any additions to the quantities herein given will be paid for extra to the contract prorating deductions or additions as per itemized prices on the bidding form.

<u>Size Pipe</u>	<u>Distance</u>	<u>Ft. Deep</u>	<u>Ave. Depth</u>
18" Pipe	1,600'	8' to 10' ave.	9.6'
18" "	120'	0 to 12' outlet	6.0'
18" "	280'	10 to 12'	10.5'
12" "	1,370'	8 to 10'	8.5'
10" "	210'	8 to 10'	8.2'
10" "	440'	4 to 6'	5.9
8" "	450'	6 to 8'	7.5

-
- 4 - Catch-basins & runs.
 - 12 - Manholes.
 - 1 - Combination Flush-Tank & Manhole.
 - 1 - Outlet for Sewer.

Any changes or alterations in this contract or the plans and specifications herein referred to shall not in any manner or to any extent release the surety on the bond herein provided for and to be furnished by said Contractors.

IN WITNESS WHEREOF said Village of Pine City, Minnesota

has caused this contract to be executed by its executive officers
and said Contractors the day and year first above written.

For the Village of Pine City, Minnesota.

Julius Dusey
President of Council

H. J. Buizer
Village Clerk.

For the Contractors:

Rogers and McLean
by C. S. Rogers

Proposal
for
SANITARY SEWER SYSTEM
for

Duplicate

The Village of Pine City, Pine County, Minnesota.

Oct. 28th 1914.

Honorable Mayor and Members of the Council,
Pine City, Minnesota.

Gentlemen:-

I)
We) herewith propose to furnish all the labor and material necessary for the complete construction of the Sanitary Sewer System including all sewer tile "Y" branches, manholes, flush tank, catch-basins, plugs, etc. shown and called for, and, including trenching and backfill and the building of concrete outlet complete. The above to be delivered ready for continuous use and successful operation for the Village of Pine City, Minn. and in accordance with plans and specifications therefore as prepared by J. F. Druar, Consulting Engineer, and, on file in his offices in St. Paul, Minn. and also on file in the office of H. J. Buirge, Village Clerk, Pine City, Minn.,

For the installation complete as called for on bill of material, including "Y" connections as called for and for the furnishing of all material and installing complete including all Y branches and plugs, outfall, etc. as described in specifications and accompanying plans as called for under Div. #1 the sum of \$5,788.⁰⁰

Fifty seven hundred eighty-eight dollars

The above prices for the complete Sanitary Sewer System include all the items called for on the plans and in the specifications and if this bid and proposal is accepted, then for any changes that may be made in the amount of the work and the material set forth in the plans and specifications, either by increase or decrease, the following unit prices shall apply as far as applicable, to-wit:-

For Sanitary Sewers:

These prices cover the cost of sewer tile, trenching, laying, backfilling, etc. complete using first quality salt glazed vitrified sewer pipe.

For furnishing and laying 4" tile for house connections
6' to 8' deep per lin. ft. seventy-five cents (\$ 0.75)

For furnishing and laying 6" tile for house connections
6' to 8' deep per lin. ft. Eighty cents (\$ 0.80)

For 8" Sanitary Sewers complete in place 6' to 8'
deep Eighty cents (\$ 0.80)

For 8" do. 8' to 10' deep ninety cents (\$ 0.90)

For 8" do. 10' to 12' " one dollar (\$ 1.00)

For 10" do. 6' to 8' " Eighty-five (\$ 0.85)

For 10" do. 8' to 10' " ninety cents (\$ 0.90)

For 10" do. 10' to 12' " one dollar (\$ 1.00)

For 12" do. 4' to 6' " seventy cents (\$ 0.70)

For 12" do. 6' to 8' " ninety-five (\$ 0.95)

For 12" do. 10' to 12' " one dollar twenty-five (\$ 1.25)

For 12" do. 8' to 10' " one dollar ten (\$ 1.10)

For 18" do. 4' to 6' " one dollar thirty (\$ 1.30)

For 18" do. 6' to 8' " one dollar forty (\$ 1.40)

For 18" do. 8' to 10' deep one dollar sixty (\$1.60)
 For 18" do. 10' to 12' " one dollar seventy five (\$1.75)

For furnishing and laying:

8" x 4" Y branch 2' - 6" long ~~Forty~~ fifty cents (\$0.50)
 8" x 6" " " " " " fifty cents (\$0.50)
 10" x 4" " " " " " sixty cents (\$0.60)
 10" x 6" " " " " " sixty cents (\$0.60)
 12" x 4" " " " " " one dollar (\$1.00)
 12" x 6" " " " " " one dollar (\$1.00)
 18" x 4" " " " " " one dollar fifty (\$1.50)
 18" x 6" " " " " " one dollar fifty (\$1.50)

For each manhole installed complete 6' - 8' deep Fifty dollars (\$50.00)
 " " " " " 8' - 10' " Fifty-five (\$55.00)
 " " " " " 10' - 12' " Sixty dollars (\$60.00)
 For each Flush Tank installed complete 5' to 8' deep one hundred (\$100.00)
 For each lamp hole 6' to 8' deep complete Fifteen dollars (\$15.00)

Drain Tile:

It may be possible that drain tile for ground water may be required on certain streets and if this is the case then the following per-foot prices will prevail for best quality vitrified drain tile laid complete per foot as described in the specifications.

For 8" tile laid complete per foot Thirty cents (\$0.30)
 For 6" tile laid complete per " Twenty-five (0.25)
 For 4" " " " " " Twenty cents (\$0.20)

For each 6" house chimney connected to sewer Y and carried to property line, the sum of Thirty dollars

For each 4" do Twenty-five dollars

For other work:

For concrete Const. 1-2-1/2-5 in place per cu. yd. 4 50
 " " " 1-3-6 " " " " " 6 75

For rock excavation per cu. yd.	\$ <u>Six dollars (\$6.00)</u>
For sheathing left in ground per M. ft. B.M.	<u>Twenty-five (\$25.00)</u>
For ordinary lumber " " " "	<u>Twenty-five (\$25.00)</u>
For brick 1,000 laid up	<u>Twenty-nine (\$29.00)</u>

A certified check made payable, unconditionally, to the order of H. J. Buirge, Village Clerk, Pine City, Minn. the sum of Four hundred Dollars (\$400.00) accompanies this proposal and in the event of our failure to execute a contract accompanied by a satisfactory bond within ten days from the date of notification of the award of the contract to us for the work herein proposed the check shall be forfeited to the Village of Pine City, Minn. In event of the rejection of this proposal this check shall be returned to the undersigned within ten days.

It is distinctly understood and by the signing of this proposal agreed, that any variations from the clauses, conditions and requirements of the plans and specifications are stated on this bidding blank and the above prices included all labor, material, supplies and equipment necessary to fully and finally complete the said work according to the plans and specifications and to leave the whole ready for continuous and successful operation.

If awarded the contract we will start the work at once and push same to completion by Dec. 15th 1914

Respectfully Submitted,

Rogers & McLean
 By C. R. McLean
 of Duluth, Minn.
422 Lyceum Bldg.

Pine City, Minnesota.

SPECIFICATIONS

for

SANITARY AND STORM WATER SEWER SYSTEM

For

PINE CITY,

PINE COUNTY,

MINNESOTA.

J. F. Druar,
St. Paul, Minnesota

Consulting Engineer.
Buffalo, N. Y.

October,

1914.

Pine City, Minnesota.

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S P E C I F I C A T I O N S

for
Sanitary and Storm Water Sewer System

for

Pine City, Pine County, Minnesota.

- Division No. 1 -

General

The work to be done under these specifications and accompanying plans consists of furnishing all labor and material and erecting and installing complete ready for continuous use and successful operation a complete sewer system including all sewer tile, manholes, catch-basins, flush tanks, the necessary connections, Y's, Specials, and all accessories under the supervision of the Village of Pine City, Pine County, Minn. and its Consulting Engineer, J. F. Druar, St. Paul, Minn., and, in accordance with these plans and specifications. The work will be in one division only and must be figured installed complete together with all accessories.

Time of Completion

As this work is ^{distinctly} necessary the time of completion will be one of the perquisites asked for on the bidding form and the work will be let in one contract. The time of completion will be strictly adhered to and a penalty for arbitrary damages of \$10.00 per day will be enforced unless unforeseen circumstances beyond the control of the contractor rendered this penalty invalid. However, in case of non-completion at the time stated in bidding form the contractor will have to pay to the Village of Pine City the sum of \$150.00 per month to reimburse them for extra engineering services required beyond the time of the date specified for completion of the work in the contract.

Bids must be sealed and marked upon the outside with the character of the proposal. The Village reserves the right to reject any or all bids.

Bids must be made out on blank forms furnished by the Village. No other bids will be accepted. Itemized unit prices, as asked for on bidding blank must be made by contractors and such prices, either by way of increase or decrease in the work called for and contemplated, shall hold good until the date set for completion of each portion in these specifications. All plans and specifications in the hands of the prospective bidders must be returned with the bid or bid will not be accepted.

BOND

The contractor or contractors shall execute in favor of the Village of Pine City, a Surety Company Bond for the faithful performance of the contract, and to indemnify and save harmless the Village from all suits and actions of any kind brought against it for or on account of actions of the elements or on account of claims for royalties or infringement of patent right, either on materials, processes, instruments or machinery, or on account of claim for material or labor furnished or on account of damages of any kind. Said bond to be for the full amount of contract price. This bond shall also be conditioned to guarantee all material and workmanship for a period of one year after the installation is complete and under it the contractor will be required to replace any defective material or faulty construction, whether due to labor or material that may develop during the year.

In the event of any increase in the amount of work herein specified, there will be given a reasonable extension of time for its completion, as may be determined by the Village Council or its authorized agent, but such extension of time shall apply only to that particular portion of the work on which changes or extensions are ordered and not to any other portion. If at the time set for the completion of the work as above mentioned, the contractor appears in arrears with his work, the Council reserves the right to complete the plant in accordance with the plans and specifications and contract and charge the expense to the contractor. If after such expense any of the contract price remains over, the amount left over is to be paid to the contractor by the Village. If a deficiency occurs over and above the contract price, such amount is to be paid by the contractor to the Village. Extra work ordered shall not be an excuse for extension of time for completion of the work unless agreed to in writing by the Council at the time order for extensions is granted.

PAYMENTS

Payments for the work will be made about the 10th of each month on the basis of estimates made by the Engineer and approved by the Village Council for work done and material furnished during the previous month provided such work and material is in accordance with the plans and specifications and approved by the Engineer. 15% of the each monthly estimate will be retained until the final estimate is made. This payment shall not include any material not unloaded from the cars. The final estimate in-

cluding the 15% retained from the monthly estimates will be paid fifteen (15) days after the completion and acceptance of the work. All material paid for on monthly estimates shall be considered the property of the Village provided the Village sees fit to claim such material.

Any payment made on the work during its progress, on account of the contract or extra work or the fact that the Council may have a superintendent or inspector on the work, shall in no case be construed as an acceptance of the work or material, but the Contractor shall be liable to all the conditions of these specifications, plans and proposal and the contract until the entire work is finished and accepted by the Council or its Engineer. If, after final payment, final settlement or acceptance is made, it develops that any portion of the work or material required according to the contract, plans and specifications has been omitted or not properly executed, said final payment, settlement or acceptance shall not exempt the Contractor from liability to replace or execute said work in accordance with the contract and plans and specifications, provided the Contractor is notified of the deficiency discovered or experienced within a period of one year from date of final acceptance. This clause is not to apply where special guarantees are called for.

EXTRA WORK

No claim for extra work or material shall be made or will be allowed except where ordered in writing by the Council and all such claims shall be presented monthly in

writing within fifteen days after the completion of such extra work.

Any work not herein or on the plans specifically specified but which may be fairly implied or understood as included in this contract, plans and specifications and any apparatus essential to the proper and convenient operation of any portion of the entire work and plant shall be supplied and installed without extra charge by the Contractor and the Engineer shall be the judge of this.

CHANGES

The Village shall have the right to make alterations in extent, dimensions, form of plans or location of the work, at any time previous to the completion of same, it being understood that the Village shall be credited on contract price, with any reduction ordered. If any increase is ordered and the price cannot be agreed upon the Engineer shall be the arbitrator. If changes or alterations of any kind in work or material or location of work and material are ordered by the Village not involving an extra expense on the part of the contractor, the Village shall not be charged anything extra but shall receive credit on contract price for any benefit derived by the Contractor on account of these changes or alterations. In case a dispute as to the cost or price of these changes or alterations arises, either by way of increase or decrease, the Engineer shall be the judge and his decision shall be final.

In case any part of the work, labor or material, in the opinion of the Engineer is executed in a defective

manner and not in accordance with plans and specifications, contract and proposal and if such imperfection shall not be of sufficient magnitude to require, in the opinion of the Engineer, the taking up and rebuilding of such imperfect part, the Engineer shall have the power and ^{is} ~~is~~ hereby authorized to make any deductions they may think fit and reasonable and just from the stipulated price of such work or the contract price.

EXAMINATION OF PREMISES

The contractors are required to examine the location of the work and a failure to do so and to familiarize themselves with all the conditions affecting same in doing the work properly will not be admitted as an excuse for not fulfilling the true spirit and intent of plans and specifications.

The interpretation of the true ~~ix~~ meaning, spirit and intent of the plans and specifications is to be a function of the Engineer ^{only} and not the contractor.

DRAWINGS, SPECIFICATIONS, ETC.

The Village will furnish the successful contractors with two sets of general plans and specifications, one to be attached to the contract, but all drawings, blue prints and specifications are to be the personal property of the Village and must be returned at the time of the acceptance of the work and before the final estimate will be given. All drawings, general clauses and conditions and specifications should cooperate and anything shown on plans and not mentioned in the specifications or vice-versa, must be executed as though shown and specified in both.

The Contractors must satisfy themselves as to the correctness of the dimensions given on any drawings.

Any dimensions, details or parts of the work that the plans and specifications do not accurately or clearly show, or any part where plans and specifications and scale drawings do not agree shall be submitted to the Engineer for explanation and ^{his} directions shall be closely followed. If any mistakes results from failure of the Contractors or foremen to fulfill these requirements the contractors shall bear the expense of any alterations resulting therefrom.

GENERAL

The Contractors and their employees shall assist the Engineer or inspectors whenever assistance may be asked for by them, to inspect the workmanship or material without extra compensation.

If any person employed on the work appears to the Village or its Engineer to be incompetent, untrustworthy or disorderly in connection with the work he shall be discharged immediately on requisition of the Council or its authorized agent and shall not again be employed on the work.

The Contractor shall have charge of and be responsible for the entire work under his contract until its completion and acceptance and any imperfect or unfaithful work not in accordance with plans and specifications and proposal and ~~contract~~ which may be discovered at any time before the final ~~acceptance~~ of the work embraced in these specifications, shall be corrected immediately on the requirement of the Engineer.

Special guarantees on apparatus, however, to apply as called for.

In case the order of the engineer to replace defective or unfaithful work, not in accordance with plans and specifications, contract and proposal is not complied with within seven (7) days after written notification thereof is given to the contractor, the engineer shall have the right to replace such defective work at the expense of the Contractor and the cost shall be deducted from any money due or which may become due the contractor.

If all the money due the contractor has been paid and the contractor fails to remedy defects recurrence to the bond may be had by the Council.

The Contractor shall at all times be subject to the direction and instructions of the Engineer relative to the work, contracted for and shall progress with the same at such time or times, in such manner and at such particular places as the Engineer may direct.

All materials, details and workmanship of whatever nature not distinctly specified in the specifications and plans for the work or in the proposal of the bidder, shall be subject to the approval of the Engineer and must be the best of its kind.

Any ambiguity or discrepancies in plans and specifications shall be decided by using the best class of workmanship and material that any interpretation will allow.

All loss or damage of any kind, either to the work, material or man, private or public property, ^{existing improvements in streets} arising out of the nature of the work to be done under these specifications, or

from any unforeseen or unusual obstructions or difficulties which may be encountered in the prosecution of the same or from any action of the elements, is to be sustained by the Contractor and the contractor shall be held responsible for each and every portion of the work called for in plans and specifications and under his contract until accepted by the Council.

The Contractor shall correctly lay out his work and give his personal attention to the faithful prosecution of the work and shall not sublet it or any part thereof without the previous written consent of the Council endorsed on the contract. He shall not assign by power of Attorney or otherwise, any of the moneys payable under his contract unless by like consent and signified in like manner.

The Contractor shall, at his own, expense, erect suitable barriers around all excavations or obstructions in or on public thoroughfares, to prevent accidents and shall place and maintain during the night sufficient red lights for this purpose on or near the work.

DEFINITION OF TERMS

Whenever the term "Contractor" or "Contractors" is used in these specifications, the contract or proposal it shall be understood as the party who has undertaken or contracts directly with the Village to do the work and furnish the labor and material herein called for. Whenever the term "Village" or "Council" or "Purchaser" is used it shall be understood as meaning the Village of Pine City, Pine County, Minnesota, as represented by its proper authorities or officers. Whenever the term "Engineer" is used it shall be understood as

meaning J. F. Druar, Consulting Engineer of St. Paul, Minn. Whenever the term "Plans and Specifications" is used in these specifications, it shall be understood as meaning not only the general and detail plans and specifications as furnished hereunder, but also all plans and specifications furnished by the successful bidders or contractors after they have been approved by the Engineer.

DAMAGES

Work shall be begun immediately after the execution of the contract for the whole or either portion of the entire work and finished and completed ready for continuous and successful operation within the dates agreed upon for the completion of the work. For any delay in completion of the contract or contracts beyond this time of completion agreed upon, the Council ~~may~~ shall have the right to deduct from the contract price of the contractor whose work remains incomplete after the date of completion agreed upon, liquidated damages for each day that the contract remains unfinished.

This amount of liquidated damages per day shall be ten (\$10.00) dollars.

If work is let in two portions each contractor shall be responsible for that portion included in his contract only and the Contractor whose work is delayed on account of the non-completion of the other portion of the work shall not be liable to the Village for the delay so caused.

Any quantities that are marked on plans or profiles or given on bidding blanks are approximately accurate only and

in no manner will have any bearing either on monthly or final estimates or the contract price.

ARBITRATION

In case of a dispute as to the interpretation of any portion of the plans and specifications, proposal or contract the same shall be decided by the engineer but if ^{his} ~~the~~ decision is deemed unjust, unwise or unreasonable the Contractor may ask to have the dispute settled and determined by arbitration in the usual way. The Village to appoint one arbitrator, the Contractor one and the two arbitrators so selected to appoint a third arbitrator and the decision of a majority of these arbitrators to be binding on both parties to the contract, viz: the Village and the Contractor. In case any expense is necessary on account of the above arbitration the cost is to be borne equally by the Village and the Contractor.

Pine City, Minnesota.

Sanitary and Storm Water Sewer System

with

Manholes, Lampholes, Flushtanks, Catchbasins

And All Accessories

for the

Village of Pine City, Pine County,

Minnesota.

- Division No. 1 -

The work to be done under this heading consists of the furnishing of all labor and material necessary for the complete construction, ready for continued and successful operation, of the various sewer conduits of a sanitary sewerage system, consisting of various sizes and lines of sewer tile conduits, manholes, flushtankes, etc. and including all necessary auxiliaries and accessories, as described hereinafter including street catch-basins, connections, etc., all in accordance with these specifications and accompanying maps, profiles and plans.

All the general clauses and conditions given on pages 1 to 11 inclusive are to apply to this portion of the work also.

GENERAL

The sewers, ⁱⁿ general, will be laid in the center of the streets.

Where sewer lines cross railroad tracks or run in close proximity to same contractor must conduct their operations in such a manner as not injure, block or obstruct the traffic ^{/to} of the railroads and contractors will be held responsible for any injury or damage done to railway tracks or railway property or

interruption of traffic or other damage.

The grade lines on profiles and map in all cases indicate the bottom of the inside of sewer tile or sewer conduit.

The Contractor shall, when requested, provide the engineers with such ladders, tools, labor, samples and other facilities as may be necessary for inspecting materials and work.

As has already been stated above, the bids submitted shall be made on the basis of unit prices covering each item or unit mentioned and given in proposal, as installed complete including all excavation of any kind except rock blasting, also including backfilling, putting street in condition, removing of surplus material, ditching, diking, pumping, bailing and draining, all sheeting, bracing and shoring, centers, molds, forms and all material necessary for the complete construction of the various items called for below. The necessary rodding holes and slants to be included in price per lineal foot of sewer.

Measurements for length of sewers will be made along the line of the sewer on the street surface, from inside to inside of manholes on line of sewer, the branches ^{to houses if any} being deducted and paid for separately. Depths will be measured from original surface of ground to invert or inside bottom line of sewer or manhole.

EXCAVATION

The Contractor will be required to make all necessary excavations. No allowance of extra pay will be made for any kind of material excavated except for rock that cannot be removed except by blasting and for boulders measuring $\frac{1}{2}$ cubic yard, or more.

All excavation shall be done by open cut from the surface

except where tunnelling may be expressly permitted by the Council or their authorized agent. Not more than 300 feet of trench shall be opened in advance of the completed sewer general^{ly} and not in any case more than 500 feet. The gutters must not be obstructed by the excavated material nor the natural flow of water in the streets in any manner prevented.

The trench shall be excavated along the line designated by the engineers and to the depth necessary for laying the sewer at the grade given.

All trenches shall be one foot wider in the clear at the bottom than the outside diameter of the pipe, without any undercutting of the banks. Where in the opinion of the engineers the original earth is sufficiently compact and solid for foundation work, the Contractor shall excavate the bottom of the trench to conform to the external form and dimensions of the invert or foundation as may be ordered. The bottom of the trench under each bell shall be so hollowed out as to allow the body of the pipe to have a bearing throughout the trench bottom and permit of making the joint. In case a trench be not excavated in any place except at joints, below the proper grade it shall be refilled to grade with sand or loam thoroughly rammed, without extra compensation.

The entire length of sewer must have a firm, uniform bearing for its whole length.

The trench shall be dug to within six inches of the grade, pipe has^{ing} been set in the bottom of the trench. The excavation for all manholes and other accessories shall be sufficient to leave at least 8 inches in the clear between their outer surfaces and the embankment or timbers which may be used to protect it.

When timbers and plank are used to support the sides of the trench ditch, the excavation, when ordered, must be of such width that there shall be one foot clear space each side at the point of greatest external diameter of the sewer where laid, and whenever such space is not left and the Council or its authorized agent shall consider it necessary to leave these timbers in to protect the work it shall be done. All sheathing ordered by the engineer to be left permanently in the ground shall be cut off one foot below the surface of the ground and the actual amount left in the ground will be paid for at the unit price as stated in bid.

All surplus material shall be removed by the Contractor and the street shall be put in a condition practically as good as before the work was commenced and satisfactory to the Council.

FOUNDATIONS

Where the material at the grade line appears not suitable for securing a firm and unyielding bearing, in the opinion of the Council or its authorized agent, the Contractor shall excavate to such a depth as he may be ordered to do below the bottom of the sewer and replace the excavated material with sand and gravel, timber or concrete. Timber or concrete, if used, will be paid for extra. Under no circumstances must sewer be laid on projecting boulders, but all boulders on grade line must be removed and the holes thus made refilled with sand or gravel, well and properly tamped and the sewer well and uniformly bedded.

In case the Contractor excavates below grade without orders, he will be required to fill the excess of excavation

with sand or gravel or other suitable material.

Where running sand, quicksand or other bad or treacherous ground is encountered, the work shall be carried on with the utmost dispatch and without interruption until the bad spot is passed.

Where such ground is encountered that will be required in the opinion of the Council or its authorized agent, the use of concrete for proper foundation such concrete will be paid for extra and consist of Portland cement concrete 1 - 3 - 6.

PIPE SEWERS

All pipe must be laid to exact grade and true line and no sewer line will be accepted where the whole diameter of the pipe cannot be seen from one manhole to the next. All pipes before being lowered into trench must be fitted together and matched so that when joined in the trench they will form a true and smooth line of pipes. They must be marked in this position and laid in the trench as marked and in no case shall they be laid until this is done. Pipes which do not fit truly shall be rejected as no chipping of either socket, hub or spigot will be permitted. The interior of the pipes shall be carefully cleaned of all dirt, cement or superfluous material of every description and a wad or sack filled with hay and made large enough to fill the diameter of the pipe and attached to a rod or cord shall at all times be kept in the pipe and drawn forward as the work progresses and the sewer left absolutely clean and smooth.

Any pipe laid and not found to conform to grade and line will be required to be taken up and relaid at the expense of the Contractor. In laying the pipe, at least three lengths

shall be uncovered to allow adjustment of the straight edge and the last pipe laid.

Before leaving the work for the night or during a storm or if for any other reason the work on the pipe line is suspended, care must be taken that the unfinished an end is securely closed with a tightly fitting iron or wooden plug.

After the pipe is laid no working or walking over them will be allowed until there is at least 30 inches of dirt covering.

The joints between the individual pipes and specials shall in all cases be made water tight by completely filling the annular space between the exterior of the spigot and the interior of the hub or socket with a gasket of oakum or ~~x~~ jute and cement mortar in the following manner:

A gasket of oakum previously dipped in cement grout or other material approved by the engineers, shall be pressed into the joint around the entire circumstances of the pipe to prevent the entrance of the cement to the inside of the pipe. The cement mortar shall then be pressed into the space between the socket and spigot, special care being taken to secure a perfect filling of the aforesaid annular space between socket and spigot at the bottom and sides of pipe as well as at the top and previous to the introduction of the mortar, said space together with the surface of the pipe bounding same shall be thoroughly cleaned of all dust, sand, earth, dirt, small stones water, etc. A neat and proper finish shall then be given to the joints by the further application of the same kind of mortar to the face of the hub or socket so as to form an even and

smooth bevel surfaced joint from the exterior of said socket to the exterior of the connecting spigot all around. The excavation made for the socket of the pipe shall be filled with sand or other suitable material and preferably some distance ^{circumference} on the ~~circumstances~~ to firmly support the cement in position. After the joint is completed, the pipes must not be disturbed in order that the joint may be kept intact. No work will be allowed to lay in water and all work must be kept free from water until the cement has set.

CEMENT MORTAR FOR JOINTS

All mortar used for making joints shall be composed of one part by measure of the best quality of American Portland Cement mixed with one equal part of clean sharp sand properly mixed and tempered with sufficient water to form a stiff paste. Any mortar which has begun to set before being used must not be used.

DRAIN TILE

If required by the Council or its authorized agent on account of possible surplus ground water, Contractor shall lay such sizes of drain tile as ordered and as per stipulated unit prices given on bidding blank. The tiling is to be laid in the same trench with the sewer pipe but entirely below the sewer. Drain tile shall be carefully laid to grade as may be given by the engineer and shall be surrounded by a three inch layer of gravel. A double thickness of muslin four inches in width shall be wrapped around each joint and the drain laid firmly and with a uniform bearing, a space of one-fourth inch being left at each joint.

Pipe for subdrains shall be vitrified clay drain tile of the same quality and soundness as specified for the storm sewer but without bells or sleeves, smooth and perfectly shaped. Or drain tile may be cement drain tile of good quality approved by the engineer and the Council.

PIPES

All sewer pipes shall be salt glazed, vitrified clay pipe and of first quality for all except ^{Catch basin} ~~storm sewer~~ pipes which may be seconds. All pipes to have the following standard thickness, to-wit:

6"	Pipe	3/4"	thick
8"	"	7/8"	"
10"	"	1"	"
12"	"	1-1/8"	"
15"	"	1-1/4"	"
18"	"	1-1/2"	"

The pipes and specials shall be sound and well burned throughout their thickness, impervious to moisture, of smooth and well glazed exterior and interior surface, free from cracks, flaws, blisters, fire-checks and other imperfections, circular in bore of true form in their lengths, whether straight or curved, internally of the exact specified diameter and of uniform thickness. The sizes given and called for on map in all cases refer to the inside diameter of the pipe.

HOUSE AND SURFACE SEWERS

The specials which are to be inserted in the line for connecting with house, lot or surface sewers shall be of the single Y branch form and shall be put in and located where directed by the Council or its authorized agent, 4" Y branches for resi-

dences except as noted below and 6" for business section. Said branches to be set or placed in such a manner as to make the grade or inclination of the lateral openings conform closely to the grade of the lateral sewer pipes connecting therewith. The laying and furnishing of extra Y branches ^{and runs to lot line} will be paid for at the unit price stated in the bidding blank, excavation and backfilling being ^{/paid} ~~paid~~ for at the unit price for straight sewer. All Y branches called for in bill of material to be included in Contract price.

All of the branch openings if not used at the time of laying the sewer shall be temporarily closed up with suitable vitrified earthenware covers or plugs properly fitted into the sockets and secured in place by filling out the place in said socket with sand covered by a thin layer of stiff mixture of cement mortar. In all cases the Contractor will be required to show the exact location of each temporarily closed branch opening by setting a suitable stake or by making a durable and recognizable mark directly opposite said opening on the side of the street so that upon subsequently excavating at the point thus indicated the side opening shall be readily and correctly found. All house, lot and surface lateral sewers that may be required shall be constructed of the best quality vitrified salt glazed tile sewer pipe and specials as may be required. In general each lateral sewer shall be laid truly at right angles to the line of the street and shall be connected with its approximate Y branch in the main by means of a suitable vitrified tile curve or bend of the same sewer diameter. In general the lateral openings or arms of Y branches deflect about 45 degrees curvature or a one-eighth bend will be required for each connection.

If required by the Council Y branches, where sewers 9 feet or more in depth are located, shall be continued upwards by using proper curves to facilitate making house sewer connections. In all such cases 6" pipe shall be used and brought to within 7 feet of the surface. Payment for this 6" pipe will be made on the basis of furnishing and laying, no extra allowance being made for excavation. This vertical pipe is put in while the general sewer is being laid and is to be properly supported by concrete or brick masonry and held firmly in place during back-filling by suitable stakes or planks.

Where not otherwise directed the house or lot lateral sewers shall be constructed ^{of} 4" ^{or} ~~5"~~ 6" Pipes laid on true and uniform ascending grade of $\frac{1}{4}$ " per foot from the main sewer to a point about one foot inside of the curb line of the street and if said lateral sewer is not immediately extended into the adjacent premises by the owner thereof the terminal hub or socket shall be closed up with a suitable stoneware cover or plug securely held in place.

MANHOLES

There shall be built two kinds of manholes as shown on plans, one to be used at sewer junction and the other where only sewer line passes through manhole. The first kind to be built at all such places where they will be needed as junction manholes as may be determined by the Council or the engineers and the Contractor shall consult the Council as to where these manholes shall be built. The manholes shall be constructed of hard burned brick laid in cement mortar and plastered outside with cement max mortar, one part cement to three sand composition $\frac{1}{2}$ " thick. The bottom shall be formed of concrete one

cement, three sand and five stone composition and particular care taken in forming the bottoms of the manholes to make the curves of the tributary sewers as easy as possible and otherwise of such shape as to prevent deposits on the ledges. In all cases bottom and curves to be so shaped that they will allow easy inspection of sewers in all directions.

On straight line split pipes may be used or gutters built of vitrified paving brick on edge. Where brick cannot be used gutters shall be built and formed of Portland cement composition, one cement to two sand. Curves shall be built of similar brick gutters and the inverts shall be exactly semi-circular of the diameter of the pipe which they connect. Bottom of manholes and curves to be absolutely smooth. Bulls eye connections for future sewers shall be provided in the manholes where directed and capped if not used at once.

All manholes shall be fitted with 5/8" ladder irons, sixteen inches apart vertically 30" long and 4" from the wall. Also with standard and approved design frame and perforated cover. Each manhole to be equipped with a substantial standard and approved dust pan of #10 boiler iron. Contractors shall furnish detail plan of cover and dust pan they propose to furnish and state weight of same if they prefer not to furnish the one shown on plans.

FLUSH TANKS

There will be a ~~number of~~ flush tanks required to be of type similar to regular manhole and as shown on plan. So that in case of extensions to the lines the tanks can be easily changed to manholes by the removal of the siphons. Provision will be made for this change. Type of apparatus to be Miller-Potter

design of Automatic Flush Tank Siphon or equal, to have no moving parts and to act automatically. These tanks to be built of 1 - 2½ - 5 Portland cement concrete or brick. The entire tank to be waterproofed and left absolutely water tight. All iron work to be the same as required for regular manholes.

OUTFALL

Sewer Contractor is to build outfall in river and carry same to one foot below low water line thoroughly ^{Concreting,} paving and rip-rapping same so as to hold outlet secure against wash by boats.

PROPERTY CONNECTIONS

It is to be noted that on page #19 the directions are given for house or lot lateral sewers. These are not required but special space is left in the bidding form for these prices and contractor is to state price of making connections to property line. If these connections are not ordered in the contractor's work shall cease at the point of sealing the Y connection on the main line of pipe which shall be closed with suitable stoneware cover securely held in place, but capable of being removed without injury to the bell of pipe.

GENERAL

The contractor at his option may build the manholes of 1 - 2½ - 5 Portland cement concrete standard specifications of the A. S. C. E. to govern all concrete work.

FINAL INSPECTION

Upon the final completion of the whole or a certain part of the work the engineer will carefully inspect all sewers ap-

purtenances and all other work done by the contractor. In each stretch of sewer from one manhole to the next, a light at one manhole shall be visible at the next through the sewer. If deemed necessary by the engineer a ball must be flushed through the sewers. Any broken or cracked pipe or stretch of pipe out of alignment must be replaced at the contractors expense. Any deposit found in the sewers, such as loose or protruding building or other material, cement, etc., shall be removed and the surface left clean and free throughout its entire length.

GUARANTEE

The Contractor will be required to guarantee and by the acceptance of these specifications does guarantee the material and workmanship to be of quality specified above for a period of one year from the date of acceptance of the work and against any defects or sign of defects that may develop during that time and the Surety Company Bond must be conditioned to fulfill this clause of the specifications and be held in force until one year from date of final acceptance.
