

ENGINEERING REPORT

FOR A

SEWER MAIN EXTENSION

TO SERVE

MOUNTAINSIDE WOODS

HILLTOP AND VISTA DRIVE

TOWN OF LLOYD
ULSTER COUNTY, NEW YORK

PREPARED BY

**ENGINEERING
PROPERTIES**

*Achieving Successful Results
with Innovative Designs*

99 Clinton St. 2nd Floor
Montgomery, NY 12549

MARCH 2011

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1.0 INTRODUCTION

Engineering Properties, P.C. is pleased to submit this sewer report for a sewer main extension to serve the project known as Mountainside Woods. The project site consists of several parcels of land totaling 153.07± acres. The proposed project scope includes the construction of 175 single family homes in a neighborhood style development.

All buildings will be connected to new public water mains and sewer mains to be installed by the project sponsor. The project is within the Town of Lloyd and will receive sewer service via connection to the existing Town of Lloyd Highland Sewer District mains which are adjacent to the site.

2.0 SITE DESCRIPTION

The project site consists of three parcels identified as Town of Lloyd tax lots, Section 87.004 Block 3 Lot 14, Section 87.004 Block 5 Lot 1.2 and 2; containing 153.07± acres. East of the property is Vista Drive, from which one of the access roads and the two proposed sewer main connections will be located. To the northeast of the property is the Hudson Valley Rail Trail, which will be accessed via pedestrians only. Beyond the rail trail is Old New Paltz Road which will serve as an alternate second connection point for sewer service to the site. To the south of the project site is Hilltop Lane, the Town of Lloyd water plant and Berean Park. At this location a second access road will be constructed connecting Hilltop Lane to the project site and Vista Drive. To the west is Town of Lloyd property and the Town's reservoirs. A USGS map indicating the site location can be found in Appendix A.

The site currently is undeveloped and consists of overgrown fields and woodlands. Topography on the project site generally slopes gradually upward from Vista Drive east to west to a stream and associated wetland area. The site then slopes gradually up to the base of Illinois Mountain where it climbs sharply towards the west. The highest elevation of the developed portion of the site is 407 feet above mean sea level located in the area of the cul-de-sac near lots 46 thru 48. Lower elevations are found at the

northeast & northwesterly portions of the property. The elevations in these areas are approximately 330 feet above mean sea level.

3.0 EXISTING SANITARY SEWER SYSTEM DESCRIPTION

The project site is located partially within the service area of the Town of Lloyd Highland Sewer District (See sewer district boundary map attached in Appendix A) and in addition has contractual rights to sewer from the Town of Lloyd Highland Sewer District (see Appendix B) which is serviced by the Highland Wastewater Treatment Plant (HWWTP).

The portion of the site that is in the district is that portion of tax lot 87.004-3-14 near the rail trail and all of tax lot 87.004-5-1.2 per the existing agreement with the Town. This agreement involved the commitment of sewer capacity to the former Westport property by the Town of Lloyd Town Board in January, 1998. This agreement with the Town of Lloyd provides for an extension of the district boundaries and assurance for future sewer treatment plant capacity of up to 75,634 GPD in exchange for donations to the district for sewer improvements.

The HWWTP is located off of River Road, east of NYS Route 9W. The plant discharges to the Twaalfskill River, which is a tributary to the Hudson River. The plant has a full design capacity of 1.75 MGD and is currently treating 1.0 MGD based on 2009-2010 readings. Of the 0.75 MGD of remaining capacity 0.52 MGD is dedicated to other users leaving an available capacity of 0.23 MGD for remaining development.

The proposed Mountainside Woods sewage system will connect to the existing 8 inch gravity sewer mains adjacent to the site. There are two connection points proposed. The first connection point is located within Sunny Brook Circle just east of Vista Drive and the second is located downstream of Sunny Brook Circle where the Town's sewer main intersects the Rail Trail. This main continues through the hamlet of Highland east of the site and eventually discharge at the HWWTP off of River Road.

As an alternative to the second connection point, the applicant is pursuing their rights to use an existing easement through tax lot 88.013-11-12 to connect to the sewer main located in Old New Paltz Road. If the ability to use this easement is confirmed, this alternate connection may be utilized.

4.0 PROPOSED SANITARY SEWER SYSTEM

4.1 PROPOSED WASTEWATER FLOWS

As previously mentioned, the development of Mountainside Woods project is designed for a total of 175 single family homes. Of the 175 new residences, 149 are projected to be three bedroom homes and 26 are projected to be four bedroom homes. The proposed water demand for this project has been calculated as shown below:

| UNIT TYPE (SINGLE FAMILY RESIDENCE) | # OF UNITS | AVERAGE # OF RESIDENTS PER UNIT | DEMAND RATE (GPD) | AVERAGE DAILY DEMAND (GPD) |
|--------------------------------------------------------|-------------------|----------------------------------------------------|----------------------------------|-----------------------------------------------|
| 3-Bedroom | 149 | 2.95 | 75 per Resident | 32,967 |
| 4-Bedroom | 26 | 3.74 | 75 per Resident | 7,293 |
| TOTALS | 175 | | | 40,260 |

Based on this analysis, the total wastewater demand for the project is approximately 40,260 gallons per day (GPD). Based on the allotted capacity of 75,634 GPD per the original agreement there is sufficient capacity to meet these needs. It should be noted that a sewer district extension will be necessary to include all the applicants' parcels in the sewer district.

4.2 PROPOSED PROJECT COLLECTION SYSTEM

Wastewater from the project will be collected in a proposed sewer main network consisting of sanitary manholes and 8" PVC SDR-35 gravity sewer mains which

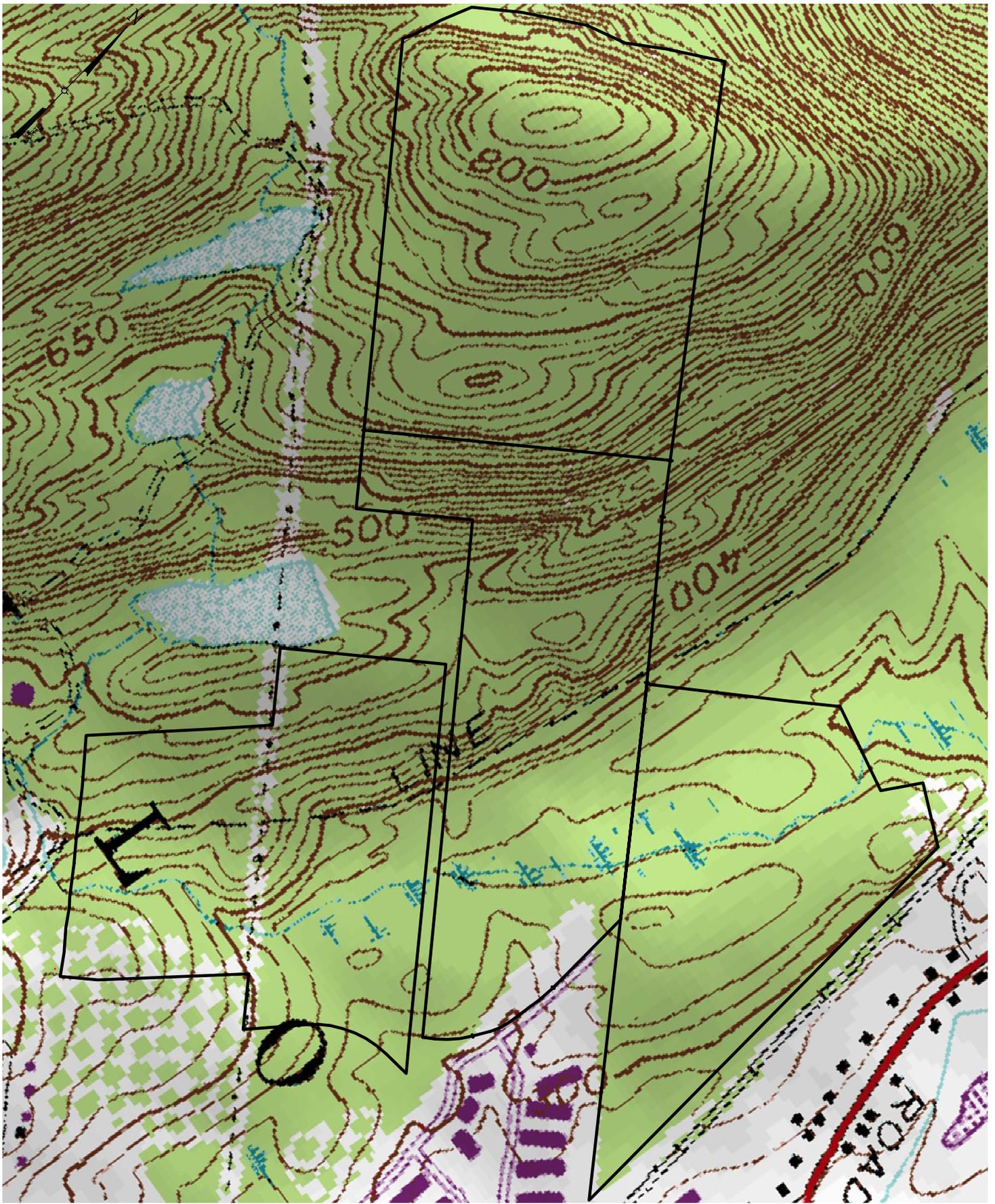
will meet or exceed minimum slope requirements. A total of 66 sewer manholes and 10,350 l.f. of sewer mains are proposed. The collected sewage will then be conveyed to the Town sewage collection system at either of the two existing connection points discussed above and then eventually to the HWWTP.

All new sewer mains shall be designed and constructed in accordance with the Technical Specifications found in Appendix D as well as the Town of Lloyd and New York State Department of Environmental Conservation requirements. All improvements will be constructed within existing or proposed road right of ways, on lands of the project sponsor or within proposed utility easements. All proposed improvements will be offered for dedication and once dedicated will be owned and maintained by the Town of Lloyd. An easement for access to and maintenance of the sewer mains within lands owned by the project sponsor will be provided to the Town by the project sponsor.

5.0 CONCLUSION

As proposed, the sewage collection system will meet or exceed all local and state design requirements.

APPENDIX A MAPS



USGS MAP

MOUNTAINSIDE WOODS
TOC DRIVE
TOWN OF LLOYD
ULSTER COUNTY, NEW YORK

DATE:
MAY '10

SCALE:
1"=500'

JOB #
944.01

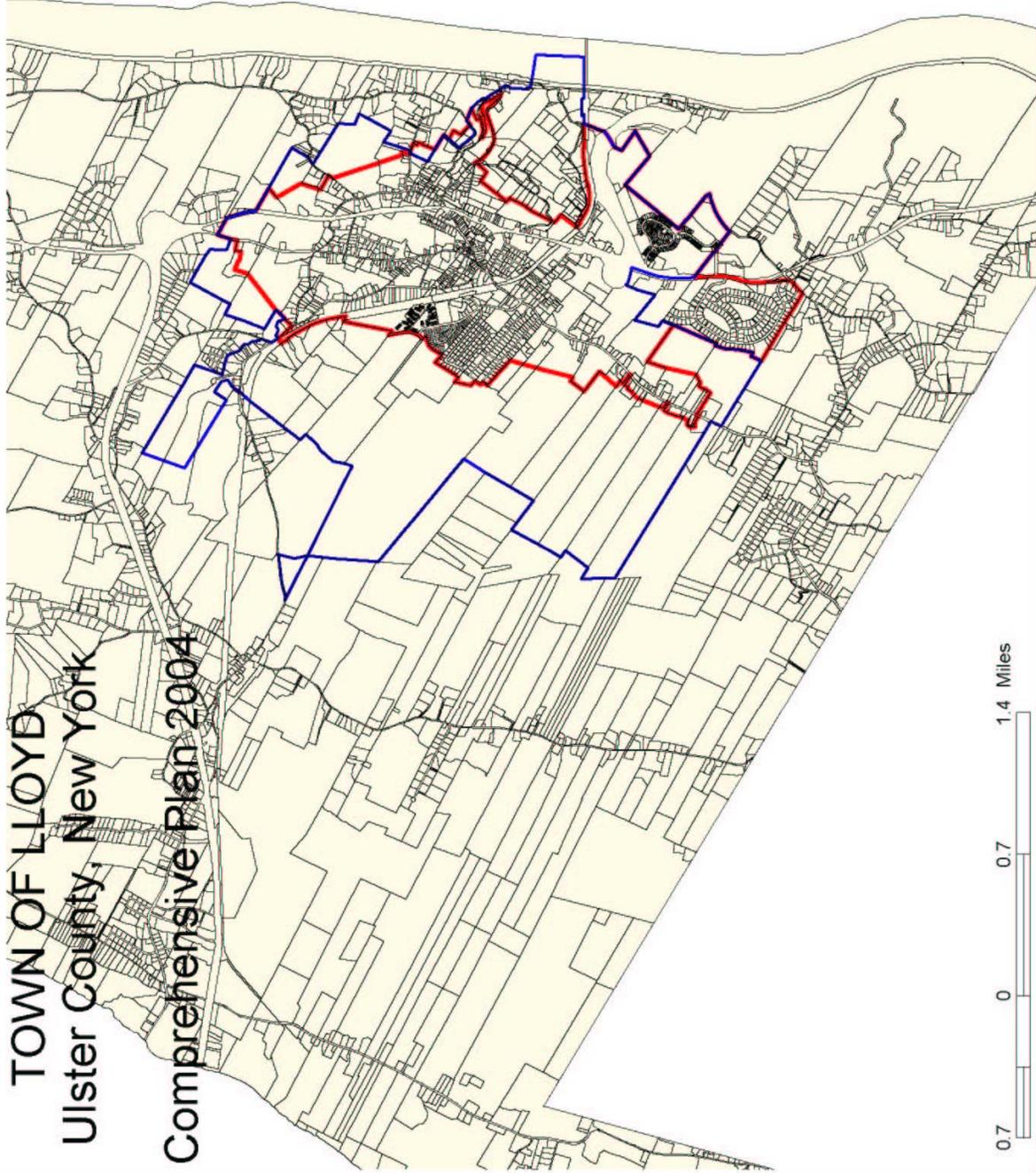
SHEET #
USGS

ENGINEERING
PROPERTIES, PC

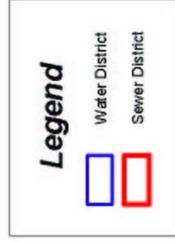
99 CLINTON ST. 2ND FLOOR
MONTGOMERY, NY 12549

Ph: (845) 457-7727
Fx: (845) 457-1899

TOWN OF LLOYD
Ulster County, New York
Comprehensive Plan 2004



Water/Sewer Districts



Sources:
Ulster County EMC
Ulster County Planning Department

Prepared By:



C.T. Male Associates, P.C.
50 Century Hill Drive Latham, New York 12110
(518) 786-7400



Figure 35

APPENDIX B
SEWER AGREEMENT

SECURITY AGREEMENT

THIS AGREEMENT, by and between the Town Board of the Town of Lloyd, constituting the Commissioners of the Highland Sewer District, 12 Church Street, Highland, Town of Lloyd, Ulster County, New York, hereinafter referred to as the "Town Board", and Willberry Corporation, a New York corporation with offices at 37 Forest Valley Road, Pleasant Valley, New York 12569, or its successors and assigns, hereinafter referred to as "Willberry",

W I T N E S S E T H :

WHEREAS, Willberry has applied to the Town Board for extension of the Highland Sewer District to certain premises west of TOC Drive, owned by and to be developed by said Corporation, its successors and assigns (the "Willberry Property") and

WHEREAS, Willberry realizes that the size and complexity of the project contemplated on the Willberry Property has necessitated the planning and commitment for substantial improvements to the facilities of the Highland Sewer District (the "District"), and Willberry wishes to insure that such facility will be in place during and after the development period and to assist the District in obtaining such facilities, and

WHEREAS, extension of the District to the Willberry Property, and furnishing of service to said premises will strain the resources of the District in different ways, at various stages of development, and

WHEREAS, the parties have reached an agreement on the rights and obligations fair to both parties in the development of the Willberry Property, and construction of necessary improvements for the District,

NOW, THEREFORE, IT IS AGREED as follows:

1. Willberry agrees in connection with the development of its parcel, to amend its map, plan and report presented to the Town Board, to provide for development in phases, and to provide a donation to the District to be applied and dedicated to sewer improvements on the following schedule:

| | <u>Donation</u> |
|------------------------------------|-----------------|
| Phase I - 34,234 gallons per day | \$68,468 |
| Phase II - 16,560 gallons per day | \$33,120 |
| Phase III - 24,840 gallons per day | \$57,680. |

It is understood that the donation for the first phase will be made at the time the district is extended by the Town Board, and thereafter the donation for each phase shall be made before the first Certificate of Occupancy is issued on each subsequent phase.

2. Additionally, Willberry agrees to post a bond or other security to guarantee the completion of the construction of the development. The initial amount of the bond shall be \$90,800.00 to be adjusted as each phase is begun. The bonding sequence will be as follows:

| | |
|-----------|-------------|
| Phase I | \$90,800.00 |
| Phase II | \$57,680.00 |
| Phase III | \$ 0.00 |

The Town Board, as Commissioners of the District, may levy and realize on the security posted if construction ceases for a period of one year from the issuance of the previous building permit or certificate of occupancy, whichever is later, upon a certification by the Supervisor and Town Engineer for sewer development that construction has ceased, and that this contract has been breached in any respect. Any breach of the provisions of this agreement shall also be a default entitling the Town Board to realize on the security, as fully as if construction had ceased in violation of this agreement.

3. In consideration of the Town Board's extension of the boundaries of the District to the Willberry Property, as described in its petition to the Town Board, Willberry agrees to commence and complete all construction sufficient to obtain final certificates of occupancy for all buildings, and to obtain final dedication to the Town of all public improvements within six (6) years of the date all approvals are obtained and the first building permit is issued. Failure to complete the project, within such time period, without written extension agreements by the Town Board, shall be a default for which the security posted pursuant to paragraph "2" above shall be forfeited by Willberry.

4. The bond or other security set forth in paragraph "2" shall be released when Phase II is completed. The bond alone is not sufficient to cause building permits to be issued. Paragraph "1" above also requires the donation set forth therein to be made. All other Town, special district and other governmental approvals must also be in place before building permits will be issued.

5. The Phase I donation shall be made at the time the District is extended, and before the first building permit is issued. It may be used to pay accumulated debt as directed by the Town Board and the Supervisor as Chief Fiscal Officer.

6. The Town and/or its special districts shall be entitled to the interest on the funds deposited, and such funds deposited plus any accrued interest may be used by the said Town Board for any capital projects or for reduction of existing bonded indebtedness, or for the installation of improvements required by the Board of Health for the Willberry project, or any other worthy project.

7. As each donation is a gift to the District, once made, it is not returnable to Willberry in any circumstance, and may be used for the aforementioned purposes.

8. The developer, Willberry, agrees that the aforesaid funds donated as security for plant capacity, have no relationship to the improvements required to be constructed within the Willberry Property, and Willberry undertakes to extend such water and sewer mains in public highways and install such water and

sewer mains, laterals, and other improvements as are necessary to provide water, sewer, drainage, lighting, cablevision and other utilities to its development, at its own expense, without any cost or expense to the Town of Lloyd or its special districts.

9. It is understood that Willberry, at this time, seeks not to bond any phase of its on-site construction and it is understood that there will be no improvement bond for on-site construction within the boundaries of its project, but that the developer, Willberry, will substantially complete all water, sewer, drainage, electric, telephone, cable, lighting and other utilities in public and private highways and easements for each phase before any certificate of occupancy may be issued by the Town of Lloyd. However, the Town Board of the Town of Lloyd reserves the right, for phases II and III to require a bond for on-site improvements, in the event that there is any default in the construction of such on-site improvements by the developer, during Phase I and after the first certificate of occupancy is issued and where there is any occupation by residents, whether by lease or by purchase, of any unit in the development. In such an event, and in the further event of an abandonment of the project, or discontinuance of the established flow of development, the Town Board of the Town of Lloyd may require bonding of all said on-site improvements, by any security which is acceptable to the Town Board and the attorney for the Town Board, in such amounts as will adequately insure the construction of the needed on-site improvements, once the project has begun. This improvement bond is separate and additional to

the bond set forth in paragraph "2" guaranteeing the development will be completed, and shall be structured by a separate agreement.

10. The Town Board agrees to exercise its best efforts to work with the Board of Health to increase the capacity of the sewer mains and plant within the District, however, it is the developer, Willberry's, ultimate responsibility to obtain its own Board of Health approval for the project and to obtain the approvals of the Planning Board, any necessary Zoning Board of Appeals approvals, and the approvals of other governmental agencies to construct the project.

11. Upon signing this agreement, the Town Board agrees to consider the application for extension to the District pending before it, and to consider the benefits of this agreement in connection with the extension of the District to the Willberry Property. Any approval of the extension will be contingent upon the absorption of, and the undertaking by, Willberry to pay all of the costs in connection with the furnishing of this improvement to the area of its development and it is agreed that because there will be no debt undertaken in connection with this specific improvement for which the public will be liable, and that it is not necessary to make application to the State Comptroller of the State of New York, pursuant to Article 12 of the Town Law, but only to file the resolutions with the Ulster County Clerk and the State Comptroller, delineating the extension of the District

pursuant to said Article 12 of the Town Law.

12. The Town of Lloyd Supervisor shall have discretion in the choice of investment of all donations as mandated for investment of municipal funds under the Local Finance Law.

13. The undersigned individual, David Berry, Joins in this agreement individually and guarantees any security or obligation under the terms of this Agreement.

IN WITNESS WHEREOF, the parties to this Agreement have set their hands and seals this 23 day of MAY, 1996.

WILLBERRY CORPORATION

By [Signature]
David Berry, President

ATTEST:

[Signature]
Secretary
Randolph L. Williams

TOWN BOARD OF THE TOWN OF LLOYD

By [Signature]
Harold C. Berean, Jr.
Supervisor

[Signature]
TOWN CLERK

[Signature]
David Berry, Individually

STATE OF NEW YORK)
COUNTY OF Dutchess) ss.:

On this 24th day of April, 1996, before me, the subscriber, personally came DAVID BERRY to me personally known, residing in Pleasant Valley, New York; that he is the President of Willberry Corporation, the corporation described in and which executed the within Instrument; that he knows the seal of said

WFE

WILLBERRY CORPORATION
P.O. BOX 427, OLD RT. 22
DOVER PLAINS, NY 12522

1072

PAY TO THE ORDER OF

Dec 2 1977

50-485/219

007974

Sum of Sixty Eight thousand Four hundred Sixty Eight and 50/100 \$ 68,468 ⁵⁰/₁₀₀ DOLLARS

The Fishkill National Bank & Trust Company

ROUTE 22 - LAGRANGEVILLE, NY 12540

FOR

Security Agreement

[Signature]

⑆001072⑆ ⑆021904855⑆ ⑆10 2 05599

WFE

WILLBERRY CORPORATION
P.O. BOX 427, OLD RT. 22
DOVER PLAINS, NY 12522

1071

PAY TO THE ORDER OF

Dec 2 1977

50-485/219

007975

Sum of Seven thousand and 00/100 \$ 7,000 ⁰⁰/₁₀₀ DOLLARS

The Fishkill National Bank & Trust Company

ROUTE 22 - LAGRANGEVILLE, NY 12540

FOR

Planning Board

[Signature]

⑆001071⑆ ⑆021904855⑆ ⑆10 2 05599

11/12/97

John Jankiewicz and the other duplicate original to be filed with the attorneys for the Highland Water and Sewer District, DiStasi, Moriello and Murphy, P.C.

The Vote: AYES Four NAYES None

The resolution was declared adopted.

- M. RESOLUTION made by Shepard, seconded by Hammond, to accept Troy Lane and the Extension of Argent Drive, as recommended by Frank Lombardi, Highway Superintendent. (See attached)

Four ayes carried.

- N. RESOLUTION made by Hammond, seconded by Shepard,
 WHEREAS, the Town's Water and Sewer District Study Committee has recommended that the Light Industrial Zone, in the Route 9W North and Upper North Road, be the subject of an extension of the boundaries of the Highland Water District, and
 WHEREAS, the Town Board deems it to be in the best interests of all concerned to proceed for an extension of the Highland Water District to the said Light Industrial Zone pursuant to Article 12-A of the Town Law of the State of New York, and
 WHEREAS, Town Law Section 109-b provides for the Town Board to appropriate funds for its engineers to prepare maps, plans and reports for proposed extensions of their special districts, and
 NOW, THEREFORE, it is resolved as follows:

1. The Town Board of the Town of Lloyd hereby appropriates the sum of \$7,800.00 to pay its engineers, Brinnier and Larios, P.C., for preparation of a proposed map, plan and report for the Route 9W North area as an extension of the Highland Water District.
2. The map, plan, and report shall conform with the requirements of Town Law Section 209-c of Article 12-A of the Town Law.
3. The expense incurred for the preparation of said map, plan and report shall be a Town charge, and shall be assessed, levied and collected in the same manner as other Town charges. If the Town Board shall thereafter establish or extend the Highland Water District to the area known as Route 9W North, and construct the improvements or contract for the required services pursuant to provisions of Article 12-A of the Town Law, the expense incurred by the Town for the preparation of the map, plan and report for such extension, shall be deemed to be a part of the cost of such improvement, or the rendering of such services, and the Town shall be reimbursed in the amount paid therefor, or such portion of that amount which the Town Board, at the public hearing held pursuant to Section 109-d of Article 12-A of the Town Law, shall allocate against such extension of the Highland Water District.
4. This resolution shall be subject to permissive referendum and the Town Clerk is directed to publish and post this resolution or an abstract thereof, along with a notice within ten (10) days, pursuant to the provisions of the Town law regarding a resolution subject to permissive referendum.

The Vote: AYES Four NAYES None

The resolution was declared adopted.

Four ayes carried.

- O. RESOLUTION made by Costantino, seconded by Shepard, to approve the Contract for Shared Services with Other Municipalities and authorize the Supervisor to sign said contract as written.

Four ayes carried.

- P. RESOLUTION made by Costantino, seconded by Hammond, declaring the specifics of a Negative Declaration in the Type I Action concerning the extension of the sewer district to the Willberry Project. (See attached)

Four ayes carried.

Supervisor wanted the payment made to the Town as stated in the security agreement between the Commissioners of the Highland Sewer District and Willberry Corporation dated May 23, 1996.

"... It is understood that the donation for the first phase (\$68,468) will be made at the time the district is extended by the Town Board..."

Dave Berry wanted the Town Board to approve the extension and give him a week to get the money.

Jankiewicz was not in favor of extending the sewer district contingent

upon a payment. He felt that once the district is extended the Town is obligated to provide sewer service to anyone who purchases that land.

DiStasi advised the Town Board not to sign the extension nor send it to the State Department of Audit and Control but to pass an informal resolution.

Avampato stated that the Planning Board is getting escrow estimates from the Town consultants. They will then proceed with the rest of the review. There are a number of issues to be addressed.

Berry did not realize the payment was due now.

- Q. RESOLUTION made by Shepard, seconded by Costantino, approving the extension of the Highland Sewer District to the Willberry project contingent upon receiving the first installment of payments as outlined in the Security agreement of May 23, 1996 and passage of a final resolution extending the district.

Roll call vote
Shepard aye,
Costantino aye,
Hammond naye,
Berean aye,
Three ayes carried

FLOODING/GROVE STREET/MEADOW STREET/DRAINAGE

Fiona Ormiston stated that two years ago there was a problem with flooding in the area of Grove Street and Meadow Street. The Town Board members looked at it. She asked if the drainage problem has been addressed by the drainage committee. She felt that money was being spent for water and sewer and there should be some to resolve this twenty-five year old problem.

DiStasi felt that the committee had never designated that area a hot spot.

Lombardi stated that Bill Rohde, Town Engineer, was preparing an estimate for materials needed to correct the problem. He was going to try and put it through the Town Highway Budget. There are five projects in Town. Sharon Road and Haviland Road are large projects. This is the smallest of the drainage problems. The Town has to take out a bond to correct the drainage problems. Drainage systems and sidewalks do not come out of Highway Funds. He can handle this small project. There is a pipe under Mr. Smith's Building. There was a stream there at one time.

DiStasi asked if Lombardi would need an easement.

- R. RESOLUTION made by Costantino, seconded by Hammond, to appoint as Temporary Motor Equipment Operators to be utilized as needed during inclement weather, not to exceed 90 days, as recommended by Frank Lombardi, Highway Superintendent:

Robert Post
Anthony DiMetro

David Magliato
Salvatore Cusa, Jr.
Four ayes carried.

- S. RESOLUTION made by Costantino, seconded by Shepard, to sign the agreement with MFS Network Technologies as amended as per the letter of intent of September 10, 1997.

One abstain (Berean),
Three ayes carried.

Supervisor explained he had not read the contract.

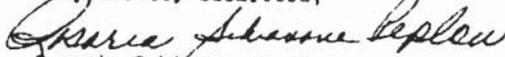
MOTION made by Hammond, seconded by Shepard, to wish Sandy Avampato, Planning and Zoning Administer, a Happy Birthday.

Four ayes carried.

MOTION made by Hammond, seconded by Shepard, to adjourn the meeting at 9:30 p.m.

Four ayes carried.

Respectfully submitted,


Rosaria Schiavone Peplow
Town Clerk

RESOLUTION AND ORDER

EXTENDING BOUNDARIES OF THE HIGHLAND SEWER DISTRICT
in the
TOWN OF LLOYD, ULSTER COUNTY, NEW YORK

At a regular meeting of the Town Board of the Town of Lloyd, held at the Town Hall, Thomas Shay Boulevard, 12 Church Street, Highland, Ulster County, New York on January 14, 1998 at 7:30 p.m.

There were: Supervisor Raymond Costantino

PRESENT: Supervisor Raymond Costantino
Councilmember William Halstead
Councilmember Nancy Hammond
Councilmember John Mazzetti
Councilmember Robert Shepard

ABSENT: None

The following resolution was moved by Councilmember Shepard and seconded by Councilmember Mazzetti as follows:

WHEREAS, a petition for the creation of an extension of the Highland Sewer District to be known as the Willberry Extension to the Highland Sewer District in the Town of Lloyd, Ulster County, New York, was presented on August 4, 1994 in due form and containing the required signatures, and

WHEREAS, an order was duly adopted by the Town Board on October 8, 1997 calling a public hearing for October 15, 1997 at 7:00 p.m., as the time and place in the Town Hall in the said Town of Lloyd as the place where the said Board would meet to consider the petition and hear all persons interested, also reciting the

filing of the petition and the improvements proposed, and

WHEREAS, such order was duly posted and published as required by law, and

WHEREAS, a hearing in the matter was duly held by the Board on the 15th day of October, 1997 commencing at 7:00 p.m. at the Town Hall in the said Town, and considerable discussion upon the matter having been had and all persons desiring to be heard having been duly heard, including representatives of the petitioner in person and various other persons speaking in favor of the establishment of the proposed extension of the Highland Sewer District.

NOW, upon the evidence given upon such hearing, and upon motion of Councilperson Shepard, seconded by Councilperson Mazzetti, and unanimously passed, it is

RESOLVED AND DETERMINED, that (a) the petition aforesaid is signed and acknowledged or approved as required by law, and it duly complies with the requirements of Section 191 of the Town Law, as to sufficiency of signers, and it is otherwise sufficient; and (b) all the property and property owners within the proposed district have benefited thereby; and (c) all the property and property owners benefited are included within the limits of the proposed district; and (d) it is in the public interest to grant in whole the relief sought; and it is further

RESOLVED AND DETERMINED, that the establishment of the

extension known as Willberry Extension of the Highland Sewer District, as proposed in said petition be approved; that the improvement therein mentioned be constructed at the sole cost and expense of the petitioner, and that the service therein mentioned be provided for; and that such district shall be designated and known as the "Willberry Extension of the Highland Sewer District" and shall be bounded and described as follows:

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the hamlet of Highland, Town of Lloyd, County of Ulster and State of New York bounded and described as follows:

TRACT ONE:

BEGINNING at a point on the southeasterly line of 46.323 acre parcel of land conveyed by Development Corporation of America to U.S.H. Corporation of New York said point of beginning being distant the following six courses from an iron rod set on the westerly road line at the north end of a temporary "T" turnaround at the north end of Toc Road, a 60 foot wide road dedicated to the Town of Lloyd and recorded in the Ulster County Clerk's Office in Liber 1174 of Deeds at page 1193. North 00 degrees 18' 10" East 300.00 feet, 78.54 feet on a curve to the left having a radius of 50 feet and a long chord of North 44 degrees 41' 50" West 70.71 feet, North 89 degrees 41' 50" West 122.00 feet, North 38 degrees 43' 00" West 154.23 feet, North 63 degrees 38' 30" East 7.68 feet and North 60 degrees 39' 35" East 43.07 feet, thence through the aforementioned 46.323 acre parcel,

- (1) North 38 degrees 43' 00" West 2008.41 feet,
- (2) South 51 degrees 22' 25" West 453.05 feet, to a point on the northeasterly line of lands now or formerly of the Highland Water Works, thence along the northeasterly line of lands now or formerly of the Highland Water Works,
- (3) North 38 degrees 37' 25" West 303.96 feet to a point, thence through the aforementioned 94.79 acre parcel,

(4) North 51 degrees 22' 25" East 1189.39 feet to a point on the southerly line of lands now or formerly of Rose Olson, thence along the southerly line of lands now or formerly of Rose Olson,

(5) South 36 degrees 28' 25" East 219.97 feet to a stone wall, thence continuing generally along a stone wall,

(6) South 38 degrees 53' 25" East 643.18 feet along Olson and Indelicato, to a stonewall corner at the northwestern most corner of a parcel of land conveyed by Sarah and George Chase to the Central New England Railroad by deed dated March 1, 1907 and recorded in the Ulster County Clerk's Office in Liber 401 of Deeds at Page 378, thence generally along a stone wall and southerly line of lands of the former Central New England Railway (now Penn Central Transportation Company),

(7) South 37 degrees 52' 25" East 921.02 feet to a point on the westerly line of the northerly projection of Toc Road, and the northwesterly line of a 28.677 acre parcel of land conveyed by Development Corporation of America to U.S.H. Corporation of New York by deed dated April 23, 1973 and recorded May 3, 1973 in the Ulster County Clerk's Office in Liber 1298 of Deeds at Page 260, thence along the westerly line of a new road and the aforementioned 28.677 acre parcel the following six courses:

(8) South 00 degrees 18' 10" West 370.39 feet,

(9) 70.47 feet on a curve to the right having a radius of 475 feet and a long chord of South 04 degrees 33' 10" West 70.40 feet,

(10) South 08 degrees 48' 10" West 140.00 feet

(11) 84.43 feet on a curve to the right having a radius of 221.51 feet and a long chord of South 19 degrees 43' 15" West 83.92 feet,

(12) South 30 degrees 38' 30" West 73.01 feet,

(13) 195.39 feet on a curve to the right having a radius of 414 feet and a long chord of South 44 degrees 08' 30" West 193.60 feet to the point of beginning.

Containing 38.791 acres, more or less.

Being a portion of a 46.323 acre parcel of land conveyed by Development Corporation of America to U.S.H. Corporation of New York by deed dated April 23, 1973 and recorded May 3, 1973 in the Ulster County Clerk's Office in Liber 1298 of Deeds at page 260.

Subject to utility easement granted to A.T. & T. recorded in the Ulster County Clerk's Office in Liber 532 of Deeds at page 394.

TRACT TWO:

ALL that parcel of land situate in the hamlet of Highland, Town of Lloyd and County of Ulster, bounded and described as follows:

BEGINNING at a point on the northerly line of lands now or formerly of the Highland Water Works, and the southerly line of lands of Building and Land Technology Corporation said point being distant the following six courses from iron rod set on the westerly road line at the north end of a temporary "T" turnaround at the north end of Toc Road, a 60 foot wide road dedicated to the Town of Lloyd and recorded in the Ulster County Clerk's Office in Liber 1174 of Deeds at Page 1193; North 00 degrees 18' 10" East 300.00, 78.54 feet on a curve to the left having a radius of 50.00 feet and a long chord of North 44 degrees 41' 50" West 70.71 feet, North 09 degrees 41' 50" West 122.00 feet, North 38 degrees 43' 00" West 1589.69 feet, South 51' 17' 00" West 403.97 feet and North 38 degrees 37' 25" West 868.96 feet, thence along the northerly line of lands now or formerly of Highland Water Works and southerly line of lands of Building and Land Technology Corporation,

(1) North 38 degrees 37' 25" West 1520.75 feet to an iron rod set on the easterly line of lands reputedly of Florence Lucas formerly of Van Wagenen, or Van Wagner, thence along said easterly line the following eight courses;

- (2) North 25 degrees 47' 00" East 52.80 feet,
- (3) North 17 degrees 47' 00" East 112.20 feet,
- (4) North 23 degrees 17' 00" East 129.40 feet,
- (5) North 51 degrees 17' 00" East 192.10 feet,

- (6) North 56 degrees 47' 00" East 257.40 feet,
- (7) North 70 degrees 47' 00" East 161.70 feet,
- (8) North 54 degrees 17' 00" East 161.00 feet,
- (9) North 57 degrees 47' 00" East 232.30 feet to an iron rod and heap of stones set on the southerly line of lands reputedly of Ormiston and Olson, formerly A.P. Ford, D.J. Coe and the estate of Peter Lefevre, thence along said southerly line,
- (10) South 36 degrees 28' 25" East 1555.88 feet to a point, thence through the lands of Building and Land Technology Corporation and the westerly line of a 46.323 acre parcel of lands of Building and Land Technology Corporation,
- (11) South 51 degrees 22' 25" West 1189.39 feet to the point of beginning.

Containing 45.20 acres, more or less.

Being a portion of the premises conveyed by South Road Realty Corp. to Building and Land Technology Corporation by deed dated January 22, 1971 and recorded in the Ulster County Clerk's Office in Liber 1254 of Deeds at Page 080 and conveyed to the Grantor herein by deed from Victorian Village, A Joint Venture dated May 15, 1992 recorded February 5, 1993 in Liber 2252 page 0045;

and it is further

RESOLVED that the proposed improvement, including costs of rights of way, construction costs, legal fees and all other expenses shall be borne solely by the petitioner, and it is further

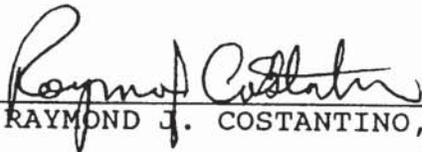
RESOLVED, that the Town Clerk of this Town shall, within ten (10) days after the adoption of this Resolution, file certified copies thereof in duplicate in the Office of the State Department of Audit and Control at Albany, New York without seeking the

permission of the State Comptroller as the same is not required, and the Town Clerk shall not make any said application to the State Comptroller, but shall simply file certified copies of this final order, extending the district.

The vote: 5 AYES 0 NAYS

The resolution was declared adopted.

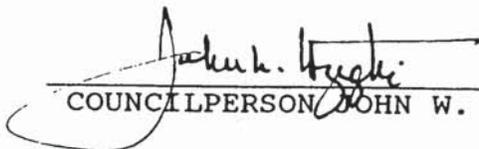
TOWN BOARD OF THE TOWN OF LLOYD


RAYMOND J. COSTANTINO, Supervisor


COUNCILPERSON NANCY HAMMOND


COUNCILPERSON ROBERT SHEPARD


COUNCILPERSON WILLIAM HALSTEAD


COUNCILPERSON JOHN W. MAZZETTI

STATE OF NEW YORK)
) ss.:
COUNTY OF ULSTER)

I, ROSARIA PELOW, Town Clerk of the Town of Lloyd, Ulster County, New York, DO HEREBY CERTIFY:

I have compared the annexed extract of minutes of the meeting of the Town Board of said Town of Lloyd, Ulster County, New York, including the resolution contained herein, held on the 14th day of January, 1998, with the original thereof on file in my office, and the same is a true and correct transcript therefrom and the whole of said original so far as the same relates to the subject matters therein referred to.

I, FURTHER CERTIFY, that all members of said Board had due notice of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the said Town this 15th day of January, 1998.



ROSARIA PELOW, Town Clerk
Town of Lloyd, Ulster County,
New York

(SEAL)

APPENDIX C
TECHNICAL
SPECIFICATIONS

SECTION 02530

SANITARY SEWER SYSTEM

PART 1.00 - GENERAL

1.01 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.02 WORK INCLUDED

- A. Work of this Section includes all labor, materials, equipment and services necessary to complete the Sanitary Sewer System as shown on the drawings and specified herein, including, but not limited to, the following:
 - 1. Installation of onsite sanitary sewers consisting of manholes, drop connections, pipe and all necessary and required accessory items and operations including connections to existing facilities.
 - 2. Alteration and/or reconstruction of existing structures including resetting existing and/or new castings to grade as required.
 - 3. Connection of building sanitary sewer service lines to the onsite sanitary sewer system.
 - 4. Installation of onsite sanitary sewer pump station and force main.
 - 5. Installation of sanitary sewer facilities within the Public R.O.W. including connections to existing sanitary sewer facilities.
 - 6. Cleaning, testing and repairing of sanitary sewer system.

1.03 RELATED WORK

- A. Section 02315 Trenching and Backfilling
- B. Section 02370 Erosion and Sediment Control
- C. Section 03305 Concrete (Site)
- D. Section 02510 Water Distribution System

1.04 QUALITY ASSURANCE

- A. The Contractor shall perform all his operations in accordance with the rules, regulations and ordinances of those governing bodies having jurisdiction.
- B. The installation of all sanitary sewer structures and pipe within the Public R.O.W. shall conform to the requirements of all agencies having jurisdiction.

- C. The requirements of the Department of Health and New York State Department of Environmental Conservation and/or any other agency having jurisdiction shall govern the horizontal and vertical separation of water lines from sanitary sewers.
- D. PVC Sewer Pipe
1. Polyvinyl chloride (PVC) gravity sewer and force main pipe shall be so installed as to not exceed a maximum deflection across the diameter of 5.0 percent. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.
 2. Upon completion of a section of sewer, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gauge assembly through the completed section. The gauge assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Owner's Field Representative.
 3. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem, to the satisfaction of the Owner's Field Representative, without additional compensation.
- E. Leakage Tests
1. General Requirements
 - (a) The Contractor shall test the completed sewers, including manholes and laterals, for leakage by infiltration, exfiltration or low-pressure air exfiltration tests as specified herein. The tests will be conducted as approved by the Owner's Field Representative. The Contractor shall furnish all necessary equipment, materials and labor for performing the tests as specified.
 - (b) The Contractor shall notify the Owner's Field Representative at least 48 hours prior to the start of testing. Testing shall only be performed in the presence of the Owner's Field Representative.
 - (c) Sections of pipe tested for infiltration and exfiltration prior to completion of the Project shall be subject to additional leakage tests, if warranted in the opinion of the Owner's Field Representative, prior to acceptance of the Project.
 2. Infiltration and Exfiltration Testing
 - (a) The test length intervals for either type of leakage test shall be approved by the Owner's Field Representative, but in no event shall they exceed one thousand (1000) feet. In the case of sewers laid on steep grades, the length of line to be tested by exfiltration at any one time may be limited by the maximum allowable internal pressure on the pipe and joints at the lower end of the line.
 - (b) The test period, wherein the measurements are taken shall not be less than four (4) hours in either type of test.

(c) Depending on field conditions, the following tests for leakage shall be employed:

(1) Infiltration Test

The test may be used only when ground water levels are at least five (5) feet above the top of the pipe for the entire length of the section to be tested during the entire period of the test. Ground water levels may be measured in an open trench or in standpipes previously placed in backfilled trenches during the backfilling operations. When standpipes are installed in the backfill for ground water measurement, the lower ends of these shall be satisfactorily embedded in a mass of crushed stone or gravel to maintain free percolation and drainage. Infiltration through joints shall be measured by using a watertight weir or any other approved device for volumetric measurement installed at the lower end of the section under test.

(2) Exfiltration Test

This test consists of filling the pipe with water to provide a head of at least five (5) feet above the top of the pipe or five (5) feet above ground water, whichever is higher, at the highest point of the pipe line under test, and then measuring the loss of water from the line by the amount which must be added to maintain the original level. In this test the line must remain filled with water for at least twenty four (24) hours prior to the taking of measurements. Exfiltration shall be measured by the drop of water level in a closed-end standpipe or in one of the sewer manholes available for convenient measuring.

When a standpipe and plug arrangement is used in the upper manhole of a line under test, there must be some positive method of releasing entrapped air in the sewer prior to taking measurements.

(3) Leakage Requirements

The total leakage of any section tested shall not exceed the rate of 50 gallons per day per mile per inch of nominal pipe diameter. For purposes of determining the maximum allowable leakage, manholes shall be considered as sections of 48 inch diameter pipe, five (5) feet long, and the equivalent leakage allowance shall be 2.25 gallons per manhole per 24 hours.

3. Low-Pressure Air Exfiltration Testing

(a) The sewer mains and/or laterals shall be tested for leakage by the use of low-pressure air as specified hereinafter and as approved by the Owner's Field Representative. The test length shall not exceed one (1) interval of pipe between two (2) manholes. Air test procedures may be dangerous and the Contractor shall take all necessary precautions to prevent blowouts.

- (b) After the pipe has been backfilled and cleaned, pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psi. Low-pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psi greater than the average back pressure of any ground water that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize.
- (c) After the stabilization period (3.5 psi minimum pressure in the pipe), the portion of line being tested shall be acceptable if the time required in minutes for the pressure to decrease from 3.5 to 3.0 psi (greater than the average back pressure of any ground water that may be over the pipe) is not less than the time indicated in the following table:

| Pipe Size (In.) | Time (Min.) |
|-----------------|-------------|
| 4 | 2-1/2 |
| 6 | 4 |
| 8 | 5 |
| 10 | 6-1/2 |
| 12 | 7-1/2 |

4. Correction of Defective Work

- (a) If leakage exceeds the specified amount, the Contractor shall at his own expense make the necessary repairs or replacements required to permanently reduce the leakage to within the specified limit, and the tests shall be repeated until the leakage requirement is met.
- (b) Any defects found in the system are to be repaired at the expense of the Contractor so as to conform strictly to the Specifications and to the satisfaction of the Owner's Field Representative. All repairs shown necessary by the tests are to be made, broken or cracked pipe replaced, all deposits removed, and sanitary sewer left true to line and grade and entirely clean, free from lumps of cement, protruding gaskets, bulkheads, etc., and ready for use before final acceptance by the Owner.

5. Compliance with Agency Requirements

- (a) In the event of conflict between the leakage test requirements specified herein with the leakage test requirements of agencies having jurisdiction over all or any portion of the sanitary sewers installed under this Contract, the more restrictive requirements shall govern.

F. Cleaning and Repair

- 1. The Contractor will be required to clean the entire newly constructed sanitary sewer system of all debris and obstructions. This shall include, but not be limited to removal of all formwork from structures, concrete and mortar droppings, construction debris and dirt. The system shall be thoroughly flushed clean and the Contractor shall furnish all necessary hose, pumps, pipe and other equipment that may be required for this purpose. No debris shall be flushed into existing sanitary sewers or streams; all debris shall be removed from the system.

2. After the system has been cleaned, the Contractor shall thoroughly inspect the system and all repairs shown to be necessary shall be promptly performed by the Contractor.
3. All work of cleaning and repair as specified herein shall be performed at the Contractor's expense and to the complete satisfaction of the Owner's Field Representative.

G. Final Inspection

1. Upon completion of the Work and before final acceptance by the Owner, the entire sanitary sewer system shall be subjected to a final inspection in the presence of the Site Engineer and/or Owner's Field Representative. The Work shall not be considered as complete until all requirements for line, grade, cleanliness, leakage tests and workmanship have been met.

1.05 SUBMITTALS

A. The Contractor shall submit the following material designs for the type specified for review and approval prior to materials being delivered to the site:

1. Polyvinyl Chloride Pipe and Fittings
2. Elastomeric Gaskets
3. Brick
4. Concrete Block
5. Concrete and Mortar Mixes
6. Pumps
7. Generator
8. Automatic Transfer Switch

B. Submit shop drawings of the following items for the type specified prior to materials being delivered to the site:

1. Precast Manholes
2. Manhole Frames and Covers
3. Ladder Rungs
4. Sanitary Pump Station
 - (a) Valve Vault
 - (b) Wet Well

- (c) Control Systems and Control Box
- (d) Access Lid

1.06 DELIVERY, STORAGE & HANDLING

A. Storage

1. Storage of pipe on the job shall be in accordance with the pipe manufacturer's recommendations, subject to the approval of the Owner's Field Representative.
 2. PVC pipe shall be stored at the site until installation in a manner, acceptable to the Owner's Field Representative, which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required to meet this requirement. Simply covering the pipe or structures which allows temperature build-up when exposed to direct sunlight will not be permitted.
- B. All pipe shall be protected against impact, shock and free fall, and only equipment of sufficient capacity and proper design shall be used in the handling of the pipe.
- C. Pipe which is defective from any cause, including damage caused by handling, and determined by the Owner's Field Representative as unrepairable, shall be unacceptable for installation and shall be replaced at no cost to the Owner as directed by the Owner's Field Representative.
- D. Pipe that is damaged or disturbed through any cause prior to acceptance of the Work shall be repaired, realigned or replaced as directed by the Owner's Field Representative, at the Contractor's expense.

1.07 JOB CONDITIONS

- A. The Contractor shall exercise whatever precautions are necessary to protect existing conditions or other Work from damage.
- B. Excavation and Backfill
1. The provisions of Section 02315 of these Project Specifications shall govern all work under this Section.
- C. Connections to Existing Facilities
1. General Requirements

The Contractor shall make all required connections of the proposed sanitary sewer into existing sanitary sewer facilities, where and as shown on the Drawings and/or as approved by the Owner's Field Representative.
 2. Connections into existing sanitary sewer facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor shall be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with

the requirements of the Owner of the existing facility shall be included in the Contract Sum.

1.08 WARRANTY

A. Sanitary Pump Station

1. All manufacturer warranties shall be turned over to the Owner.
2. The Contractor shall guarantee all work for a period of one (1) year.

PART 2.00 - PRODUCTS

2.01 MATERIALS DEFINITIONS

A. Sanitary Sewer Pipe, Fittings and Joints

1. Gravity Polyvinyl Chloride Pipe and Fittings (PVC)
 - (a) Pipe shall be Bell and Spigot, utilizing an elastomeric gasket, shall conform to "Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings," SDR-35, ASTM Specification D 3034, latest edition.
 - (b) The minimum "pipe stiffness" at 5% deflection shall be 46 psi for all sizes when tested in accordance with ASTM designation D-2412. Straight pipe shall be furnished in lengths of not more than 13 feet, and Y-branches shall be furnished in lengths of not more than 3 feet. Saddle Y-branches will not be allowed.
 - (c) Elastomeric gaskets shall be used for all pipe joints, shall conform to "Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals," ASTM Specification D 3212, latest edition. Joints for the polyvinyl chloride pipe shall be push-on bell and spigot joints using elastomeric ring gaskets. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and groundwater, and which will endure permanently under the conditions of the proposed use.
 - (d) Lubricant, as recommended by the pipe manufacturer and approved by the Owner's Field Representative, shall be used for all pipe joints.
 - (e) All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Owner's Field Representative to apply such tests as he deems necessary.
2. Pressure Polyvinyl Chloride Pipe and Fittings (PVC)
 - (a) Polyvinyl Chloride Pipe shall conform in all respects to "Polyvinyl Chloride (PVC) Pressure Pipe, CL 150, 4 inch through 12 inch, for Water," AWWA

Specifications C-900, latest revision, in 20-foot nominal lengths except as may otherwise be specified herein.

- (b) PVC elastomeric gasket joints shall be in accordance with AWWA Specifications C-900 and referenced ASTM Specifications.
- (c) Lubricant, as recommended by the pipe manufacturer and approved by the Owner's Field Representative, shall be used for all pipe joints.
- (d) All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM Specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Owner's Field Representative to apply such tests as he deems necessary.

B. Manholes

- 1. Brick shall conform to the "Specifications for Sewer and Manhole Brick (Made from Clay or Shale)," AASHTO Designation M-91, latest revision, Grade MS.
- 2. Precast Manholes
 - (a) Where called for on the Drawings or approved in writing by the Site Engineer, the Contractor may substitute precast manholes. Precast Reinforced Concrete Manhole Sections shall conform to the "Specifications for Precast Reinforced Concrete Manhole Sections," AASHTO Designation M-199, latest revision.
 - (b) Prior to fabrication, the Contractor shall submit four (4) sets of plans of the proposed precast structures to the Owner's Field Representative for approval, along with design criteria and certification by the manufacturer that the structure will support the design load.
 - (c) The minimum compressive strength of the concrete used for all precast structures shall be 4,000 psi. Where steps are required in structures, steps shall be installed during the casting of the structures, aligned as specified herein. Joints in the structures shall be tongue and groove joints, formed in such a manner so that either a mortar or rubber seal can be applied.
 - (d) No precast manhole shall be fabricated or delivered to the job site until it has been approved by the Owner's Field Representative and/or Site Engineer. All structures shall have number and manufacturer's name on each section.
 - (e) Approval for the use of precast structures shall relieve the Owner and Site Engineer of any additional costs for modification of openings due to line or grade changes, deletion of structures, relocation of structures, or addition or deletion of lines to be connected into the structures, and such additional cost shall be at the Contractor's expense.
- 3. Manhole Frames and Covers

- (a) Manhole Frames and Covers shall be gray cast iron castings, conforming to the requirements of AASHTO Designation M-105, latest revisions, Class 30. The castings shall be true to pattern in form and dimensions as specified and shall be free from pouring faults, sponginess, cracks, blowholes and other defects that affect their strength and other characteristics for the intended use. All surfaces shall have a workmanlike finish.
 - (b) All component parts shall fit together in a satisfactory manner and frames and covers shall be of non-rocking design so as to prevent rocking or rattling under traffic. Frames and covers that are warped or rocking, as determined by the Owner's Field Representative, will be rejected and shall be removed and replaced by the Contractor to the satisfaction of the Owner's Field Representative at no cost to the Owner.
 - (c) Unless otherwise specified, the word "SEWER" shall be integrally cast on the cover in raised letters and centered. Letter size shall be two (2) inches.
 - (d) All castings shall be coated with an asphalt paint which shall result in a smooth coating and not be tacky or brittle.
4. Concrete shall conform to the requirements for concrete as specified herein under Section 03305 Concrete (Site) of these Project Specifications.
5. Reinforcement shall be new billet stock deformed steel bars conforming to AASHTO Designation Grade 40. Steel wire fabric shall conform to AASHTO Designation M-55. Metal accessories, chairs, ties and other items necessary for proper placement of reinforcing, shall be provided. Reinforcement shall be free from scale, oil, ice and structural defects and shall be stored so as to prevent contact with the ground.
6. Mortar
- (a) Mortar shall be composed of one (1) part Portland cement and two (2) parts sand by volume. Hydrated lime, not to exceed four (4) pounds of lime to each bag of cement, may be added as approved by the Owner's Field Representative. Material requirements shall be as follows:
 - (1) Portland Cement shall conform to the requirements of AASHTO Designation M-85, Type II.
 - (2) Hydrated Lime shall conform to the requirements of ASTM C-6.
 - (3) Mortar Sand shall conform to the requirements of AASHTO Designation M-45, except that aggregate shall be no coarser than #8 sieve size.
 - (4) Water shall be clean and shall not contain any oil, acid, alkali, salts, vegetable matter, organic matter or other deleterious substances.
 - (b) Hand mixing of mortar will be permitted only when, in the opinion of the Owner's Field Representative, the amount of mortar to be used makes machine mixing undesirable. When hand mixing is used, the ingredients must first be thoroughly mixed dry in a tight box, after which the proper

quantity of clean water shall be gradually added and then the materials shall be hoed or worked until a uniform mixture is secured. Admixtures may be added only with the prior written approval and in the presence of the Owner's Field Representative.

- (c) No greater quantity of mortar is to be prepared than is required for immediate use and it shall be worked over constantly with hoe or shovel until used. No Mortar shall be retempered and none shall be used more than one and one-half (1½) hours after mixing. All mortar containing cement which remains upon stopping work shall be discarded.

7. Steps for Manholes

This Specification covers the material requirements for steps for manholes.

- 1. General: The minimum design live load, for steps, appurtenances and fastenings, shall be a single concentrated load of 13.5 kN. The live loads imposed by persons occupying the steps shall be considered to be concentrated at such points as will cause the maximum stress in the Structural member being considered.

Steps shall be designed so a worker's foot cannot slide off the end. The minimum length of the rungs shall be 10 inches.

Whenever a combination of dissimilar types of metals are used in the manufacture of steps, appurtenances and fastenings, the materials shall be treated to prevent deleterious effects.

- 2. Materials: Manhole steps shall be fabricated from one of the following:

- (a) Ferrous Metal. Steps shall conform to the following requirements:

Iron Castings - Class 25A, subsection 715-09.

Malleable Iron Castings - Grade 35018, subsection 715-09.

Steel - ASTM A575, Grade M 1020, galvanized in accordance with 719-01, Type 1.

The steps shall have a minimum cross sectional dimension of 25 mm exclusive of any coatings placed on them.

- (b) Non-Ferrous Metal. Steps shall conform to the following requirements:

Aluminum Castings - Alloy 356-T6, 715-03.

Wrought Aluminum 6061-T6, 6005-T5, or 6351-T6, 715-04.

When aluminum steps are used, the portion of the step which will be in direct contact with cement concrete or concrete mortar, shall be coated with Zinc Chromate Primer conforming to the requirements of subsection 708-04 or shall be coated with bituminous material approved by the materials Bureau.

- (c) Reinforced Plastic. Steps shall consist of polypropylene or other plastic material meeting this specification. It may be extruded, cast, or molded into the standard size and shape manhole steps, having a steel core center for strength and completely covered by the plastic molding for corrosion protection.

The plastic material shall have the following characteristics:

- (1) Resistance to Salt and Caustic Solutions. Resistance to the following solutions when submerged for 30 days:

10% Sodium Chloride
10% Hydrochloric Acid
10% Sodium Hydroxide
10% Sulfuric Acid

- (2) Flow Point. A flow point of 160°C or greater.
- (3) Flexibility. It shall remain flexible over a temperature range of -30°C to +120°C upon long aging.
- (4) Fire Resistance. It shall be non-burning, self-extinguishing, or very slow burning. The steel core shall be not less than 12 mm diameter and shall have the following physical characteristics:

Tensile Yield - Minimum - 275 MPa
Tensile Strength - Minimum - 482 MPa

The plastic step, when cast into a concrete block the proper depth, shall withstand a minimum load of 13.5 kN applied on 625 mm⁽²⁾ area in the center of the step without cracking or breaking the plastic coating, loosening the step in the concrete or permanently deforming the step.

PART 3.00 - EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions where the Sanitary Sewer System is to be installed and notify the Owner's Field Representative of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Owner's Field Representative.

3.02 INSTALLATION

A. General Requirements

1. The Contractor shall install all sanitary sewer structures and pipe in the locations as shown on the Drawings and/or as approved by the Owner's Field Representative. Pipe shall be of the type and sizes specified and shall be laid accurately to line and grade. Structures shall be accurately located and properly oriented.

B. Pipe Installation

1. Laying Pipe

- (a) Each length of pipe shall be laid with firm, full and even bearing throughout its entire length, in a trench prepared and maintained in accordance with Section 02315 of these Project Specifications. Pipe will be laid upgrade with bells upgrade unless otherwise approved by the Owner's Field Representative.
- (b) Every length of pipe shall be inspected and cleaned of all dirt and debris before being laid. The interior of the pipe and the jointing seal shall be free from sand, dirt and trash before installing in the line. Extreme care must be taken to keep the bells of the pipe free from dirt and rocks so that joints may be properly assembled without overstressing the bells. No pipe is to be trimmed or chipped to fit.
- (c) No length of pipe shall be laid until the preceding lengths of pipe have been thoroughly embedded in place, so as to prevent movement or disturbance of the pipe.
- (d) Installation of polyvinyl chloride (PVC) sewer pipe shall be as follows:
 - (1) Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement check for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.
 - (2) Polyvinyl chloride pipe shall be supported on a minimum of four (4) inches of compacted crushed stone, or as directed by the Owner's Field Representative. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Crushed stone shall be 3/4 inch in size or such other sized as may be approved. The gravel shall consist of clean, hard, and durable particles or fragments, free from dirt, vegetation, or other objectionable matter and free from an excess of soft, thin elongated, laminated or disintegrated pieces. The crushed stone shall be spread in layers of uniform thickness and shall be compacted to a minimum density of ninety-five (95) percent of the maximum density of the soil as determined by the Standard Proctor Test (AASHTO Designation T-99).
 - (3) Suitable bell holes shall be provided, so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material.
 - (4) All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends.

- (5) Joints shall not be "pulled" or "cramped" unless permitted by the Owner's Field Representative.
- (6) Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.
- (7) All premolded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as specified. If the pipe is unsatisfactory, as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the Work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these Project Specifications.
- (8) Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.
- (9) After each pipe has been properly bedded, enough crushed stone shall be placed between the pipe and the sides of the trench, and thoroughly compacted, to hold the pipe in correct alignment. Bell holes, provided for jointing, shall be filled with crushed stone and compacted, and then crushed stone shall be placed and compacted to a minimum of six (6) inches over the top of the pipe to complete the pipe bedding.
- (10) Polyvinyl Chloride (PVC) gravity sewer pipe shall be so installed as to not exceed a maximum deflection of 5%. Such deflection shall be computed by multiplying the amount of deflection (nominal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.
- (11) Upon completion of a section of sewer, including placement and compaction of backfill, the Contractor shall measure the amount of deflection by pulling a specially designed gauge assembly through the completed section. The gauge assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Owner's Field Representative.

2. Pipe Extension

- (a) Where existing pipe is to be extended, the same type of pipe shall be used unless otherwise specified or approved by the Owner's Field Representative.

3. Full Lengths of Pipe

- (a) Only full lengths of pipe are to be used in the installation except that partial lengths of pipe may be used at the entrance to structures where necessary to obtain a proper connection to the structure.

4. Pipe Entrances to Structures

- (a) All pipe entering structures shall be cut flush with the inside face of the structure, and the cut ends of the pipe surface of the structure shall be properly rounded and finished so that there will be no protrusion, ragged edges or imperfections that will impede the flow of water or affect the hydraulic characteristics of the installation. The method of cutting and finishing shall be subject to the approval of the Owner's Field Representative.

5. Bedding and Backfilling

- (a) The type of materials to be used in bedding and backfilling and the method of placement shall conform to the requirements of the Section 02315 of these Project Specifications and as shown on the Details of the Drawings.

6. Protection During Construction

- (a) The Contractor shall protect the installation at all times during construction, and movement of construction equipment, vehicles and loads over and adjacent to any pipe shall be performed at the Contractor's risk.
- (b) At all times when pipe laying is not in progress, all open ends of pipes shall be closed by approved temporary water tight plugs. If water is in the trench when work is resumed, the plug shall not be removed until the trench has been pumped dry and all danger of water entering the pipe has been eliminated.

7. Tolerance

- (a) Pipe shall be laid accurately to the line and grade as shown on the Drawings and/or as approved by the Owner's Field Representative. Allowable tolerances shall be one-quarter (1/4) inch in grade and one-half (1/2) inch in line in any section of pipe between manholes. No adverse grades shall be allowed. Deviations from these tolerances shall be grounds for rejection of the line of pipe by the Owner's Field Representative. Any line which has been rejected shall be rebuilt to the correct line and grade by the Contractor at his own expense.

C. Pipe Joints

- 1. All joints are to be made watertight in accordance with the requirements specified herein.
- 2. Pipe shall be jointed in strict accordance with the Pipe manufacturer's instruction. Jointing of all pipe shall be done entirely in the trench.

D. Manholes

1. General Requirements

- (a) All manholes shall be built in accordance with the Details and in the locations shown on the Drawings and as specified herein.
- (b) Structures shall be constructed of precast Concrete. Structures will require Shop Drawing approval by the Owner's Field Representative and/or the Site Engineer.

2. Inverts

- (a) Smooth concrete invert channels shall be constructed in all manholes to insure a smooth flow of water through the structure.
- (b) The invert channels shall be carried up to the elevations shown on the Drawings and/or as approved by the Owner's Field Representative. Channels shall slope smoothly and evenly from the entrance pipe to the outlet pipe.
- (c) Invert channels shall be built for future extensions where shown on the Drawings and/or where directed by the Owner's Field Representative.

3. Frames, Covers and Gratings

- (a) Frames, Covers and/or Gratings for manholes shall be of the type and size indicated on the Drawings. Frames shall be well bedded in mortar and shall be set accurately to the correct alignment and grade. In areas to be paved, frames shall be set by using four (4) points of reference, set ninety (90) degrees apart, to insure accurate setting to proposed pavement grade.

4. Ladder Rungs

- (a) Ladder rungs shall be installed in all manholes, spaced twelve (12) inches on center vertically and staggered. Rungs shall be set securely in place during the construction of the masonry wall.

5. Precast Manholes

- (a) Precast manholes shall be installed only after Shop Drawings have been approved.
- (b) The base unit of the precast structures shall be founded on an approved compacted subgrade. Should the base unit be a slab only, the first riser unit shall be set in a pad of 2½-inch minimum thick mortar or as recommended by the Manufacturer and approved by the Owner's Field Representative. Prior to setting subsequent manhole barrel sections, apply primer to tongue and groove ends and allow to set in accordance with manufacturer recommendations. Place "Ram-nek", or equivalent, plastic rope on tongue end. Lower next section into position, and remove excess

material from interior of structure. Add additional material on exterior of joint, if necessary, for completely watertight joint.

- (c) The top grade of the precast concrete corbel section shall be set sufficiently below finished grade to permit a maximum of four (4) and a minimum of two (2) courses of eight (8) inch brick to be used as risers to adjust the grade of casting. Manhole frames shall be set on a grout pad as specified hereinabove.

6. Bitumastic Coating

- (a) The entire exterior surface of all manholes shall be coated with two (2) coats of an approved bitumastic material to produce a dry film thickness of 0.07 inches (70 mils) per coat.

E. Connections to Existing Facilities

- 1. The Contractor shall make all required connections of the proposed sanitary sewer into existing sanitary sewer facilities, where and as shown on the Drawings and/or as approved by the Owner's Field Representative.
- 2. Connections into existing sanitary sewer facilities shall be performed in accordance with the requirements of the Owner of the facility. The Contractor shall be required to comply with all such requirements, including securing of all required permits, and paying the costs thereof. The cost of making the connections in accordance with the requirements of the Owner of the existing facility shall be included in the Contract Sum.

F. Alterations and/or Reconstruction of Existing Structures

1. General Requirements

- (a) The Contractor shall alter and/or reconstruct existing structures where shown on the Drawings, and/or as approved by the Owner's Field Representative. In general, alterations shall be made with the same type of material used in the original construction unless otherwise indicated on the Drawings or approved by the Owner's Field Representative.

2. Adjustment to New Grade and Alignment

- (a) All castings on existing sanitary sewer structures, that are to remain, shall be adjusted to new grade and alignment. When such adjustment is required, the castings shall be carefully removed and the walls of the structure reconstructed as required. The castings shall be cleaned and reset in a firm mortar bed to the new grade and alignment. Existing castings which are broken, damaged or otherwise unfit for incorporation in the new work shall be replaced under the Contract Sum.

3. Removal of Portions of Walls of Existing Structures

- (a) In all cases of alteration and/or reconstruction of existing structures, existing walls shall be removed to a point where the existing walls will provide sound

and adequate foundation for the construction of the new walls as approved by the Owner's Field Representative.

4. Damage to Existing Structure and/or Pipe

- (a) The Contractor shall exercise extreme care during such alteration and/or reconstruction so as not to damage any portions of the structure and/or pipe shown to remain. Any such damage shall be repaired to the satisfaction of the Owner's Field Representative.

5. Structures to be Cleaned

- (a) Upon completion of alteration and/or reconstruction of existing structures, all structures shall be cleaned of any accumulation of debris or foreign matter of any kind and shall be kept clean of such accumulation until final acceptance of the Work.

G. Relocation and/or Abandonment of Existing Facilities

1. The Contractor shall not abandon, disconnect, obstruct or in any other way interfere with the operation of an existing sewer facility until such time as adequate permanent or temporary substitute facilities have been constructed and placed in operation.

H. Service Lines

1. General Requirements

- (a) The Contractor shall make all required connections of the building sanitary sewer service lines into the onsite sanitary sewer system where and as shown on the Drawings and/or as approved by the Owner's Field Representative. Work shall include making the service line connections into the onsite sanitary sewer system, furnishing and installing all service line pipe from the existing onsite sanitary sewer system to points located ten (10) feet outside of the proposed right-of-way lines and properly sealing the ends with watertight plugs. Service line extensions from these points into the building will be performed by others.

2. Coordination with Building Contractor

- (a) The Contractor will be required to coordinate his Work with the work of the Building Contractor to determine the exact location and elevation of the point of entry into the building. If the Building Contractor has installed his portion of the sanitary sewer service line, Work under this Contract shall also include final connection of the sanitary sewer service line five (5) feet outside the building line to the building service line at no additional cost to the Owner.

3. Connection into Onsite Sanitary Sewer System

- (a) Sanitary sewer service line connections to the pipe of the onsite sanitary sewer system shall be made with proper fittings supplied by the pipe manufacturer and as shown on the Drawings into existing manholes, new

manholes, or the onsite mains in a manner satisfactory to the Owner's Field Representative.

- (b) The Contractor shall install 45 degree wye branches in the onsite sanitary sewer mains in all locations where building sewer service line connections are shown on the Drawings directly entering the onsite sewer main. Connections of the sanitary sewer service lines shall be made into the wye branches by means of 45 degree bends. The connections shall be made thoroughly watertight and Class A Concrete shall be placed under each connection to bear on undisturbed earth and firmly support the connection. All Work shall be performed to the satisfaction of the Owner's Field Representative.

END OF SECTION