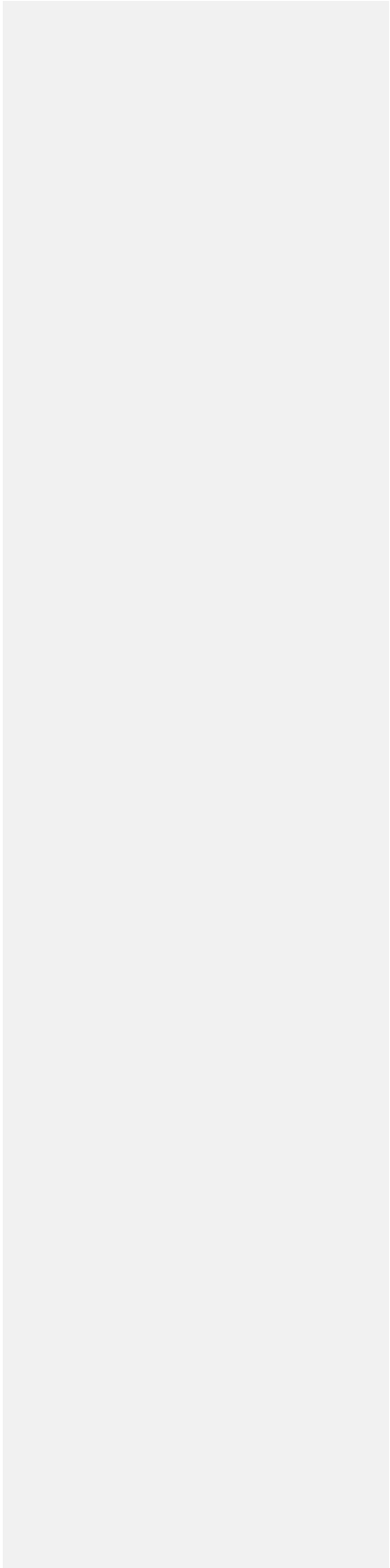


**THE MANUAL OF
PROCEDURES AND REQUIREMENTS FOR
CONSTRUCTING SANITARY SEWERS
FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY WESTMORELAND
COUNTY, PENNSYLVANIA**

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I. INTRODUCTION

The existing sanitary sewer conveyance and treatment system in Murrysville and/or customer communities (Export, Delmont, Salem, Plum Boro and Monroeville) consists of lateral sewers, sewer mains, interceptor sewers and a sewage disposal plant. These facilities are the property of the Franklin Township Municipal Sanitary Authority in Murrysville (herein after referred to as the "Authority") or of the respective communities or Authority outside of Murrysville. The facilities are a combination of developer constructed and municipally built sewer systems, constructed at various times. With the continued development of the region now and in the future, it can be expected that additional sewerage facilities will be provided by private developers.

The Authority considers it of prime importance that all new facilities meet uniform standards of design and construction. So that this uniformity can be achieved to the benefit of both the Authority and the private developers, this manual presents the procedures and requirements for planning and constructing all sanitary sewerage facilities to be proposed for acceptance of ownership by the Authority. In particular, this manual is intended as a guide for subdivision developers and contractors in the planning and construction of sewerage facilities in accordance with the Municipality's land development and subdivision regulations, as may generally pertain to sewerage.

Any reference to contractor in this manual shall mean developer and/or contractor. Any reference to engineer in this manual shall mean the Authority's consulting engineer unless otherwise stated. Definitions of terms frequently used in this manual are included in the glossary appended to this manual.

The standards for construction contained in this manual apply to all facilities which may at any time become tributary to the Authority's facilities or may become the Authority's facilities irrespective of the municipality in which the facilities are built.

II. PROCEDURE FOR PROVIDING PUBLIC SEWERAGE

The developer shall follow the procedure outlined below to obtain final approval of his plans concerning sanitary sewerage facilities for development of property in Murrysville.

A. Preliminary Work

1. Explain the general intent of the developer's plan to the Murrysville Planning Department. Existing buildings within 200 feet of a sewer must be connected if at all possible. All buildings within a development must be connected.
2. Submit application card to the Pennsylvania Department of Environmental Protection sources (DEP) in Greensburg for module forms. DEP Greensburg will record the application and forward it to DEP Pittsburgh, which in turn will furnish planning module components I, II, IV, and V for completion. The developer or his engineer must complete these modules, obtaining any information required concerning existing public sewerage from the Authority and/or Authority Engineer.

B. Initial Meetings

1. Murrysville Planning Department - The developer shall prepare his planning modules and review them with the Murrysville Planning Department and the Authority. At this time, the Developer shall submit to the Planning Department the application form which states:
 - a) the owners full name, address, and telephone number,
 - b) a brief description of the location of the plan,
 - c) the proposed number of lots,
 - d) approximate linear feet of sewer line and the number of manholes,
 - e) location of sewage treatment plant,
 - f) utilities serving lots;
 - g) linear feet and width of rights of way, and
 - h) acreage of development and acreage proposed as lots.
2. The Authority and the County Planning Department - will be contacted by the Planning Department at this time and will review the plans and make comments and recommendations at this preliminary level. Allow one month for this review. In the event that on lot considerations for treatment are planned, developments in excess of 10 lots require DEP approval for onlot systems and package treatment plants may be required.
3. Murrysville Planning Commission - The developer or his engineer shall then meet with the Murrysville Planning Commission and obtain the Commission's comments and tentative approval of the plan in writing. Such approval shall be in the form of a cover letter for transmittal of the planning modules as described in Section II.A.2 or shall be a copy of the minutes of the Planning Commission meeting in which approval was given.
4. Murrysville Council - Following tentative approval by the Planning Commission, the developer shall meet with the Council to obtain preliminary approval to enter the sewer system.

5. If the plan represents a supplement to the municipality's Official Act 537 sewage plan, the developer must have the form for transmittal of planning modules to DEP signed by the Municipal Secretary. It is not necessary to meet with the Secretary for this transaction. If the plan represents a revision to the municipality's Official Act 537 sewage plan, a meeting with the Council is required and the Council must adopt a letter of resolution to revise their official sewage plan and sign the form entitled "Resolution For Plan Revision".
6. Other Meetings - To acquire information concerning whether this development or project is a supplement or a revision, contact the following agencies:
 1. Municipal Planning Department
 2. DEP Greensburg
 - c) Westmoreland County Planning Department

C. Submission of the Planning Modules

1. Following the initial meetings, the Murrysville Council shall submit the completed planning modules to the Greensburg DEP after review by the Authority. Greensburg DEP will review the modules and then forward them to Pittsburgh DEP for final approval.
 - a) A cover letter or copy of the minutes of the Planning Commission minutes containing approval as described in Section II.B.
 - b) A transmittal letter as described in Section II.B., as well as a copy of the resolution to revise the official sewage plan if applicable.
 - c) The letter of preliminary approval from the Authority, as described in Section II.B.
 - d) An 8 ½" x 11" USGS map showing the site location.
 - e) The completed planning module forms.
 - f) The County Planning comments or date of submission to same.
2. Allow at least one month from module submission to obtain DEP approval. Note: DEP has up to one hundred twenty (120) days to review and approve.
3. DEP will advise the developer of its approval of the planning modules through the Authority and the Municipality.

D. Preparation of Final Plans

1. The developer shall complete his final plans and profiles including construction drawings and specifications.

These plans must include but not be limited to:

- (a) a master plan, if proposal is the first submission of several phases, or if it is an addition to or a section of a large development.
- (b) a final subdivision plan, prepared in accordance with the applicable subdivision regulations.
- (c) lot layout prints.
- (d) a plan and profile of all streets, showing all utilities including the sanitary sewers.

- (e) sanitary sewer construction plan and profile showing types and sizes of pipe and how it interfaces with the existing system. The plans should be drawn on 24" x 36" sheets with a 1"=50 horizontal scale and a 1"=10 vertical scale. Engineering drawings shall be provided for special features such as inverted siphons, ravine crossings, etc. If pump stations are necessary, engineering drawings shall be provided showing plan layout, flow diagram, hydraulic profile, and types and sizes of major equipment.
 - (f) all underground utilities.
 - (g) a soil erosion and sedimentation control plan. If the development project covers land disturbance activities involving 5,000 square feet or more, a complete report and plan is necessary. These must be reviewed and approved by the County Conservation District.
 - (h) if less than 5,000 square feet are involved, a soil and sedimentation control plan will be required but no approval from the County Conservation District is necessary.
2. Further information can be obtained from the Westmoreland County Conservation District Office concerning soil erosion and sedimentation control plan and permit requirements.
 3. Sanitary sewer design drawings must bear the seal of a registered professional engineer.
 4. The plans and profiles shall be prepared in accordance with the design requirements in Section IV, the specifications for sewer construction included in Appendix A, and the typical details for sewer construction in Appendix B of this manual. It is intended that all phases of good planning will be considered and resolved in preparation of the preliminary plans, and that any changes for the final plans, which will incorporate the comments and recommendations of the Authority Engineer, will be minor and that final approval by the Authority will be a short review.
 5. Together with the plans, the developer shall complete the application for a sewer extension permit, after the planning modules have been approved by DEP. This application must include:
 - a) a check or money order less than ten (10) days old from the developer payable to the Commonwealth of Pennsylvania for any fees due.
 - b) two copies of notarized application forms completed in the name of the Franklin Township Municipal Sanitary Authority.
 - c) two copies of the letter of introduction summarizing the application.
 - d) two site plans on USGS maps.
 - e) two sets of the specifications, with an engineer's seal and signature on the cover sheet.
 - f) two sets of subdivision plans for recording.
 - g) three sets of the final plans and profiles signed and sealed by an engineer.
 - h) three copies of the soil erosion and sedimentation control plan with an engineer's seal and signature on the cover sheet.
 - i) Short form DEP application.

6. Upon securing the signature of the appropriate responsible Authority official on the application form, the above package of information can be submitted to DEP, Pittsburgh. Allow at least two months for processing by DEP.
7. The developer shall enter into an agreement with the Authority in which the Authority will agree to take over the sewer system if the sewer system is approved by the Authority, such approval being based on compliance with the specifications, rules, and regulations contained in this manual. This can be done by contacting James C. Brucker, the Manager of the Franklin Township Municipal Sanitary Authority. A sample form of the agreement is included in Appendix D.

As part of this agreement, the developer shall furnish:

- a) a letter of credit, cash account or bonds issued by a reliable insurance company,
 - b) Performance Bond,
 - c) Labor and Material Bond Maintenance Bond the developer shall also agree to furnish "as-built" reproducible drawings of the sewer system at the completion of construction and prior to acceptance,
 - d) Escrow money; The required deposit, payable to the Franklin Township Municipal Sanitary Authority. The deposit will be 5% or a reasonable amount of the estimated cost of the sewer construction as estimated by the Authority and/or its Engineer. This deposit will be used by the Authority to
 1. cover costs of Plan review by the Authority's Engineer,
 2. preparation of "Agreement for the Construction of Sanitary Facilities in Murrysville",
 3. preliminary review by the Authority Engineer for DEP reports, recording DEP permits,
 4. inspecting any lines within the development,
 5. the services of the Authority Engineer to prepare as built drawings if as built drawings are not received from the Developer sixty (60) days after completion of construction and prior to acceptance.
 6. The services of the Authority Engineer to Survey the new facilities to verify the "as built" drawings.
8. After completion and acceptance by the Authority of the sanitary sewer by the developer, if there remain any monies not spent by the Authority for plan review, inspection of construction and legal fees, such monies shall be returned to the developer. In the event the initial deposit is insufficient for the purpose provided, the developer will, at the request of the Authority, deposit additional funds to defray additional costs and expense. An itemized accounting of all such monies will be supplied to the developer, if requested.
 9. This deposit is exclusive of the tap fee, which includes the inspection of the tap in, and the connecting sewer. The tap fee (which is not charged until tap in of the building) is a fixed fee and will neither be refunded in whole or in part.

Submit three (3) complete sets of final sanitary sewer drawings, as described above, and three (3) copies of the completed planning modules. These will be distributed by the Authority as follows:

- 1) one to the Authority Engineer (plans and modules)

- 2) two to the Authority (plans and modules)

E. Final Meetings

1. The developer shall review the final plans, profiles, and erosion control plans with the Murrysville Planning Commission.
2. After DEP issues the Water Quality Management Permit to the Authority, the Authority will inform the developer and the Solicitor will record the permit.
3. The developer shall then meet with the Murrysville Planning Commission and gain its final approval.
4. The developer shall then meet with the Murrysville Council and obtain its approval of the final plans. Release of plans is predicted on posting of required sureties.
5. The developer shall then review the plans with the Westmoreland County Planning Department.
6. At this time the original plans, may be recorded in the Westmoreland County Recorder's Office. Since the Recorder's office will not return the original tracing, it is advisable to have reproducible copies of the plans made for the developer's use and filing with Murrysville.

F. Construction

1. After the approval of all above agencies has been gained, the construction may proceed.
2. When the sewers are completed, the developer will turn the sewers over to the Authority. The Authority will only approve these sewers, however, if they lie five or more feet inside of the edge of a public right of way or lie in the center ten feet of a twenty foot wide right of way; if they have been built in accordance with the "Specifications for Sewer Construction", if they pass the tests described therein, and agree with the approval plans as verified by a survey to be conducted by the Authority's engineer at the completion of construction. If the sewers must go into use before such approval, as would be the case when sewage from an approved upstream development must pass through the subject sewers, the Authority will have the right to regulate the use of the subject sewers, even though the Authority has not yet assumed ownership of the subject sewers. When the developer certifies to the Authority that the development is complete, he shall furnish an eighteen-month maintenance bond to the Authority guaranteeing the work. No taps may be made in to the sewer until it is approved by the Authority.

III. SUMMARY OF COSTS PAYABLE BY DEVELOPER

A. DEPOSIT

1. 5% or a reasonable amount of the estimated cost of the sewer construction as estimated by the Authority and/or its Engineer.
2. Subject to increase or refund according to actual costs incurred by Authority in processing application and inspecting installation.

B. PERMIT APPLICATION FEE

Any current fee at date of application, payable to DEP through the Authority, for sewer systems; any current fee at date of application, for sewer extensions with pumping stations.

C. TAP IN FEE

1. Due at time of individual tap ins.
2. \$3,000.00 per residence, or current rate at date of tap in.
3. \$3,000.00 for nonresidential customers for the first EDU and \$2,900.00 for each additional EDU based on the average residential consumption which the nonresidential customer is expected to discharge to the sewers. Refer to FTMSA Resolution No. 07-07.

IV. DESIGN REQUIREMENTS

The designs of all proposed sewerage facilities must be in complete compliance with the requirements of the Department of Environmental Protection, but are subject to the approval of the Consulting Engineer of the Authority. The Sewerage Manual published and distributed by the Department of Environmental Protection is available as a guide for design and plan preparations. A copy can be obtained by writing to the Regional Sanitary Engineer, Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh, PA 15222 (412-442-4000).

A. Plan Preparation

All final plans submitted to accordance with Section 12, referred to previously and following:

The Authority must be uniform and in Part III of the Sewer Manual, must specifically conform to be

1. The size of each sheet shall be 24 inches by 36 inches.
2. The title block in the lower right corner of the drawings shall contain a title description, name of project or plan, name of developer, name of engineer, scale of drawings and date.
3. Each sheet shall bear the seal of a registered engineer or registered surveyor for sanitary sewer drawings. A registered engineer's seal is required on each drawing involving pump station construction.
4. For pump station and treatment plant drawings, the plans shall consist of plan views, elevations and appropriate sections.
5. For sewer drawings, both plan and profile shall be shown.
6. All plans shall be drawn to a scale that permits all necessary information to be shown clearly. For sewer drawings, profiles shall have a horizontal scale of 50 feet to the inch (1:50) and a vertical scale of (10) feet to the inch (1:10), and plans should be drawn to a corresponding horizontal scale of the profile view.
7. All elevations shall be based on USGS datum.
8. A cover sheet with an index and/or index map shall be provided for sets of plans of 3 sheets or more.
9. One sewer connection shall be shown for each property to be served but in any case the interval between sewer connections shall not exceed 200 feet per side of sewer, unless otherwise approved by the Authority.
10. The plans should provide typical details for all appurtenances not clearly illustrated in the layout or plan drawings. For certain common appurtenances such as manholes, creek crossings, etc., the plans must specifically include typical details as

shown in Appendix "B". If desired, these typical details can be attached to the specifications on 8 1/2" x 11" sheets as given in Appendix "B", but reference to these typical details must then be made on the plans.

11. All copies of drawings furnished to the Authority should be of the dark line type. Upon completion *of* project construction, reproducible tracings showing "as built" conditions including all underground utilities, angles and distances between manholes, sizes and brands and types of pipe, top and invert elevations of each manhole, exact location of all building sewer connections relative to the nearest manholes upstream and downstream, and the name of the contractor, shall be furnished to the Authority, before final approval of construction will be given.
12. A copy of as-built drawings in electronic format shall be submitted to the Authority.
13. Plans of the Authority's sewer system are available for reference at the Authority office, 3001 Meadowbrook Road Murrysville, Pennsylvania 15668. Upon request, prints of any such drawings will be furnished by the Authority at the cost of reproduction.

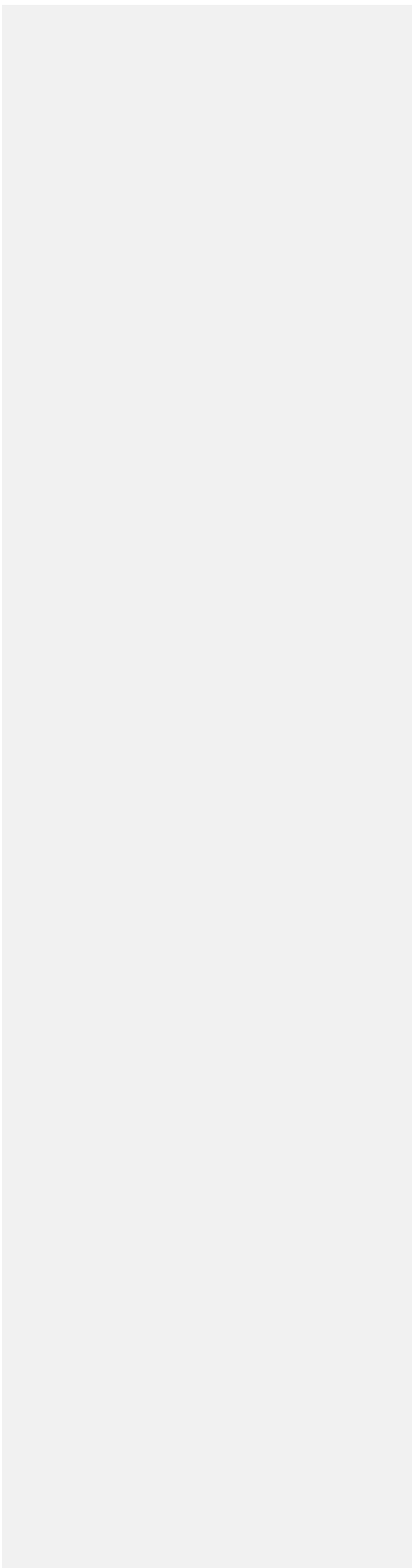
B. Specifications

1. For all sewer construction, the material provided and methods of construction shall conform to the Authority's "Specifications for Sewer Construction," a copy of which is included in this manual as Appendix "A". For special items not covered by these specifications, supplemental specifications shall be issued by the Authority to cover such items as deemed necessary by the Authority for each project. These supplemental specifications will be issued by the Authority upon receipt of preliminary plans or request from the private developer.
2. For sewer projects to be constructed by the developer's own forces, it will be the responsibility of the developer to completely familiarize his workmen with the requirements of all specifications and to maintain a copy on the job site for referral. For sewer projects to be constructed by a contract with a firm separate from that of the developer, complete compliance with the required specifications shall be a term of the contract, and so verified to the Authority.
3. For projects involving other than sewer construction, such as pumping stations, it will be the responsibility of the developer's Engineer to submit detailed specifications for such construction. These specifications shall be subject to review by the Authority and revision if considered necessary by the Authority to assure that acceptable construction will be performed.

C. Easements

1. A permanent easement recorded in the name of the Authority of at least twenty (20) feet shall be provided for all proposed sanitary sewers. All sewers to be approved by the Authority must be within the center for a public right of way (center 10 feet of a 20 foot wide right of way) or be not less than 5 feet inside of the edge of a public right of way.

2. For proposed sewers to be located on property outside the limits of the subdivision plan, right of way easements or recorded release of damage claims shall be obtained by the developer and evidence of such agreement furnished to the Authority prior to requesting final approval of plans. The special requirements of the Authority for these rights of way will be discussed with the developer upon his pre-application or preliminary planning submissions.



V. CHECKLIST FOR DEVELOPERS SEWER DRAWINGS

- A. Note that before construction drawings can be submitted for review, DEP approved Land Use Planning Modules must be approved.

- B. Preliminary construction Plan and Profile drawings showing subdivision lots and easements for sewers are given an initial review by the Authority and/or it's Engineers and a construction cost estimate provided by the Authority and/or it's Engineers will become the basis for the deposit of 5% or a reasonable amount of the estimated cost of the sewer construction, which the developer provides to the Authority.

- C. Construction Plans:
 - 1. Cover sheet signed and sealed.
 - 2. Location map showing proposed development and existing sewers in the vicinity.
 - 3. Drawing index if over three drawings.
 - 4. Recording Plan showing sewer easements. Individual R/W agreements with R/W drawings through private property.
 - 5. North Arrow.
 - 6. 8" Sewer abutting each lot.
 - 7. Engineer's seal on each drawing.
 - 8. Existing sewer permit number at tie in point.
 - 9. Water tight manholes where prone to inflow.
 - 10. Sewers out of streams where possible.
 - 11. Erosion control plan.
 - 12. Drawing size 24" x 36".
 - 13. Scale 1" = 50 feet horizontal and 1" = 10 feet vertical.
 - 14. All underground utilities plus Act 287 Utility Listing.
 - 15. Location of manholes in berm must be approved by the Municipality.
 - 16. Concrete encasement for stream crossings extended 5 feet beyond stream bank.

- D. Profiles
 - 1. On USGS datum.
 - 2. 400 ft. maximum between manholes.
 - 3. Concrete anchors when over 20% slope.
 - 4. Vented MH at the end of each line.
 - 5. Minimum 3 feet of cover .
 - 6. Maximum cover should not exceed 20 feet if possible.
 - 7. Bored state road crossings.
 - 8. Utility clearances.
 - 9. Min. 0.50% slope, 1.00% at end of lines.
 - 10. Drop MHs for 2 differences in and out of MHs.
 - 11. Concrete encasement under streams and where minimum cover can't be met.
 - 12. Match crowns with larger diameter sewers.
 - 13. Premium (2a modified) stone backfill is required within roadway and berm areas.

E. Miscellaneous

1. Erosion and Sedimentation Control Plan must be provided with Westmoreland County Conservation District review letter.
2. Pump stations reviewed in detail on an individual basis.

Sewer Design Considerations

1. Easements provided for possible future extensions.
2. Sewer deep enough for possible future extensions.
3. Sewer size and slope for possible future flows.
4. Downstream system capacity.

VI LAWS AND REGULATIONS PERTAINING TO NEW SEWER CONSTRUCTION

Both the Municipality and the State have enacted various laws and ordinances concerning the construction of sanitary sewers, the most important of which include:

A. Department of Environmental Protection (DEP)

Of primary importance to the requirements of the State is the Clean Stream Law, administered by the Department of Environmental Protection for the State Sanitary Water Board, in accordance with Act No. 394 of the General Assembly of Pennsylvania, approved June 22, 1937, which provides as follows:

"Approval of plans, design, and relevant data by the Sanitary Sewer Water Board. All plans, designs, and relevant data for the construction of any new sewer system, or for the extension of any sewer system, by a person or municipality, or for the erection, construction, and location of any treatment works or intercepting sewers by a person or municipality, shall be submitted to the Sanitary Sewer Water Board for its approval before the same are constructed or erected or acquired. Any such construction or erection which has not been approved by the Board by written permit, or any treatment works not operated or maintained in accordance with the rules and regulations of the Board, is hereby also declared to be a nuisance and abatable as herein provided."

Because permits can generally only be issued to municipalities, agencies of the municipalities or public utilities, all permits for the construction of new sewerage facilities by private developers or other private interests must be obtained in the name of the Franklin Township Municipal Sanitary Authority, the agency responsible for public sewerage in the Municipality. Application forms can be obtained by writing to the Department of Environmental Protection, 400 Waterfront Dr., Pittsburgh PA., 15222

The actual submittal of this application will be by the Authority, however, the private developer must prepare the application. In addition, the private developer proposing the construction of the sewerage facilities shall pay the permit fee to the State. A period of at least one month is required by the Department of Environmental Protection to process the application. Because construction cannot proceed without the permit, this delay should be taken into account in the original planning of the sewerage project.

Another requirement of DEP pertains to the installation of any such facility "in, along, across or projecting into all streams and bodies of water" of the Commonwealth, as provided in 25AA Code Chapter 105. These regulations require that a permit be obtained from the Soils and Waterways Section of the Department of Environmental Protection prior to actual construction. Application for such permit will be made by the persons(s) proposing the new sewerage facilities. Application forms can be obtained by writing to the Department of Environmental Protection, 400 Waterfront Drive, Pittsburgh PA 15222.

All permit applications to the Soils and Waterways Section shall first be submitted to the Authority for review. The Authority will retain one copy. Normally, a period of at least two months is required to process this permit application. Any fee required will be paid by the developer.

In conjunction with the requirements, special attention is directed to the requirements of the Pennsylvania Fish and Game Commission that adequate measures be taken to limit the erosion of the soil disturbed during construction and to trap sediment resulting from work in or along streams and prevent the siltation of waterways.

B. Department of Transportation

When any proposed construction is to be undertaken within the right of way of any public roadway, the Department of Transportation requires that a Highway Occupancy Permit be obtained from the Department. Here again, the person(s) proposing the new sewerage facilities shall be responsible for obtaining the Highway Occupancy Permit, when required. All applications shall be submitted to the Authority for review. The Authority will retain one copy. Application forms can be obtained by writing to the Permits Unit, Department of Transportation, Uniontown, Pennsylvania, 15401. Any fee required will be paid by the developer.

C. Department of Labor and Industry

It is also a requirement of the State that all sewer construction conform to the Regulations for Excavation and Construction of the Department of Labor and Industry. For the most part, these regulations govern safety requirements of construction excavation, particularly as to bracing, shoring and sheeting of trench excavation. It is specifically required that notice by the contractor be given to the Department of Labor and Industry on prescribed forms before any excavation is started. An exception to this requirement of notice is allowed for any person hereinafter known as "FIRM", the majority of whose revenue is not obtained from contracting or construction, which digs or orders dug by its own employees more than two hundred (200) excavations in any one year if the following requirements are met: (1) An exemption application be filed with the Department (2) All work be supervised by either a registered engineer or a member of the American Society of Safety Engineers. (3) A daily file of work information be maintained. (4) All disabling injuries be reported to the Department.

All work shall be done in conformance with the provisions of safety of the Commonwealth of Pennsylvania and the U.S. Occupational Safety and Health Act (OSHA).

Application forms and copies of the Regulations for Excavation and Construction can be obtained by writing the Secretary, Department of Labor and Industry, Harrisburg, Pennsylvania. All applications and notices to the Department of Labor and Industry shall first be submitted to the Authority for review. The Authority will retain one copy. Any fee required will be paid by the developer.

D. Murrysville Ordinances and Regulations

In addition to State laws and regulations, Murrysville enforces certain requirements pertaining to the construction of sewerage facilities.

Ordinance No. 3669 pertaining to public sewerage:

1. requires the connection of all occupied buildings on properties abutting and accessible to the sanitary sewers with the sanitary sewers in all areas of the Municipality,
2. forbids the use and provides for the abandonment of septic tanks or other unapproved sewage disposal systems in the defined areas,

3. provides for construction standards for sanitary sewers and regulates their use,
4. provides penalties for noncompliance,
5. provides for the issuing of permits and the payment of sewer connection charges, and
6. forbids the discharge of storm waters or unacceptable sewage in to the sanitary sewers.

Ordinance Nos. 7071, 11075 and 11175, Subdivision and Zoning Ordinances, also require connection to the public sanitary sewer system or provision of a package treatment plant.

Ordinance No. 6180, which pertains to Land operations.

The requirements contained in this manual shall be considered the official regulations of the Franklin Township Municipal Sanitary Authority.

From time to time, the present laws and regulations of the State, the Municipality and the Authority may be revised and amended. It is also likely that new laws and regulations will be formulated. The Authority will make every effort to make known all such laws and regulations; however, the final responsibility for compliance with all applicable laws and regulations of the Municipal, County, State and/or Federal Government will rest with the private developer and/or contractor undertaking the construction project, regardless of whether such laws and regulations have or have not been brought to the attention of the private developer by the Authority.

E. Penalties

Any violation *of* the requirements of the Authority for the planning and construction of sewerage facilities in the Municipality constitutes a violation of either. the Municipality's Land Subdivision Regulations, which provide the following penalty provisions:

"Any person, partnership or corporation, who or which being the owner of any lot, tract, or parcel of land shall layout, construct, open or dedicate any street, (or) sanitary sewer for public use or for the common use of occupants or buildings abutting thereon, or who sells, transfers or agrees or enter into an agreement to sell any land in a subdivision or land development, or erect any building thereon, unless and until a final plat has been prepared in full compliance with the provisions of this ordinance and of the regulations adopted hereunder shall be guilty of a misdemeanor, and upon conviction thereof such person, or the members of such partnership or the officers of such corporation; or the agent of any of them, responsible for such violation (shall) pay a fine not exceeding one hundred dollars (\$100) per lot or parcel or dwelling within each lot or parcel or the Municipality's sewer system Ordinance, which provides the following penalty provision:

"any person, firm or corporation failing to make a proper connection within the time specified after receipt of proper notice shall, upon conviction thereof before a justice of the peace, pay a fine or penalty of fifty (\$50) dollars for each day in violation hereof, and violating any of the other provisions of this ordinance shall pay. a fine or penalty of not less than five (\$5) dollars nor more than one hundred (\$100) dollars, and in default of payment of either thereof be sentenced to undergo an imprisonment of not less than five (5) days nor more than thirty (30) days in the County Jail."

VII. INSPECTION OF CONSTRUCTION

All construction of sewerage facilities in the Authority's service area shall be subject to inspection by representatives of the Authority to assure that such construction is accomplished in accordance with the approved plans and specifications.

At least ten days prior to starting construction, the applicant shall notify the Authority of the anticipated starting date of his proposed construction and the schedule of operation through completion of the project. At the time of this notification, a meeting shall be arranged between the applicant, his construction foreman and representatives of the Authority to completely review all aspects of the construction project, prior to start of construction. This meeting is considered extremely important both to the interest of the Authority and the contractor. Therefore, this requirement will be strictly enforced and no construction will be permitted without such a meeting.

The responsibility for inspection of the construction project for the Authority will be with the Authority under the advice of the Consulting Engineer. Direct inspection of the construction will be performed by an inspector working under the direction of the Consulting Engineer and/or Manager. The detailed method of operation and coordination between the Authority and its representatives and the contractor for each project will be completely reviewed at the preconstruction meeting referred to above. In general, however, the inspector will be the Authority's representative on the job, inspecting all materials and methods of construction to assure that they comply with the requirements of the approved plans and specifications and will have complete authority to enforce such requirements. It will be expected that the contractor coordinate all construction activities with the inspector and be reasonable in the scheduling of construction during normal working hours. At no time shall the contractor undertake any construction work without the knowledge of the inspector. If the requirements of the approved plans and specifications are not being met, the inspector can require, with written notice, that all work be stopped until compliance with the approved plans and specifications is gained.

Should any questions or controversies arise between the contractor and the inspector, the decision of the Authority's Consulting Engineer and/or Authority Manager will be final.

Upon completion of the construction work, a detailed final inspection including a survey shall be made by the Authority and Consulting Engineer to determine that the completed facilities have been constructed in accordance with the approved plans and specifications and that a minimum five (5) feet of public right of way is available on each side of the sewer. Approval will not be given by the Authority until all discrepancies and deficiencies revealed by this final inspection have been satisfactorily corrected.

APPENDIX "A"
SPECIFICATIONS FOR SEWER CONSTRUCTION
FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY

SECTION I GENERAL CONDITIONS

The term "Contractor" shall herein refer to the developer and/or contractor.

1.01 EXAMINATION AND INSPECTION

The work shall at all times be subject to examination and inspection by authorized representatives of the Franklin Township Municipal Sanitary Authority, who shall have free access to the work, and be furnished by the Contractor with every reasonable facility for examination of the works.

It shall be the duty of the Authority's Engineer and inspector to see that all materials and work are properly inspected and all such materials and work conform fully to the requirements of these specifications. They shall in no case act as foreman or perform other duties for the Contractor nor interfere with the management or method of the work by the Contractor.

The Engineer and/or inspector of the Authority shall have the right to reject defective materials or workmanship require its correction. Rejected workmanship shall be satisfactorily corrected. Rejected materials shall be satisfactorily replaced with proper material and the rejected material shall be removed from the premises. Failure or neglect on the part of the Engineer and/or inspector of the Authority to condemn or reject any bad or inferior material or work shall not be construed to imply an acceptance of such work or materials, if such bad or inferior material or work becomes evident at any time prior to the final acceptance of the work by the Authority.

Where specific inspection or tests are required by the specifications or by instructions of the Authority, Engineer, or Inspector, the Contractor shall give timely notice of his readiness for inspection.

1.02 TEMPORARY SUSPENSION OF WORK

The Engineer and/or Inspector of the Authority shall have authority to suspend the work wholly or in part, due to unsuitable weather, or such other conditions as are considered unfavorable for the suitable prosecution of the work, or due to the failure of the contractor to carry out orders or to perform any provisions of the approved project and/or these requirements.

If it should become necessary to suspend work for a sustained or an indefinite period, the Contractor will be notified in writing. The Contractor shall store all materials satisfactorily, and he shall take every precaution to prevent damage or deterioration of the work performed. The Contractor shall resume work after such suspension upon notification by the Authority.

1.03 SETTLEMENT OF DISPUTES

In case of any dispute relative to the quality of materials or work, or the manner of performing the work between the Contractor and the Inspector, the Contractor is entitled to request a review of such controversy by the Authority's Engineer. The decision of the Authority Engineer shall be final.

1.04 OBSERVANCE OF LAWS

The Contractor shall at all times observe and comply with all Federal and State laws (including Act 257) and local bylaws, ordinances and regulations in any manner affecting the conduct of the work or applying to employees on the project, as well as all orders or decrees which have been promulgated or enacted, or which may be promulgated or enacted, by any legal bodies or tribunals having authority or jurisdiction over the work, materials, equipment, employees or the contract.

1.05 PERMITS AND LICENSES

The Contractor shall procure all necessary permits and licenses, pay all charges and fees, therefore, and shall give all notices necessary and incidental to the proper and lawful prosecution of the work.

1.06 RESPONSIBILITY AND LIABILITY OF AUTHORITY

The Authority or any of its authorized representatives assumes no responsibility for the superintendence or direction of the personnel, use of equipment, or methods employed by the Contractor; or for any liability arising there from or incidental to.

1.07 TESTS

All materials to be incorporated in the proposed work are subject to laboratory tests, field inspection and mill certification, when directed by the Engineer and/or inspector of the Authority. The entire costs of any required testing and certification shall be borne by the Contractor. Sampling, testing and inspection shall be made in accordance with the standards of the American Society for Testing and Materials.

SECTION II EXCAVATION, BACKFILL AND EMBANKMENT

2.01 GENERAL

The contractor shall excavate, protect and backfill all foundations, trenches, tunnels and other excavations that may be necessary for completing the work of the approved plans.

2.02 WIDTH AND DEPTH OF TRENCHES

Banks of trenches shall be kept as nearly vertical as possible, and the trenches shall be not less than twelve (12) inches nor more than sixteen (16) inches wider than the outside diameter of the barrel of the pipe to be laid therein. If sheeting is required the foregoing dimensions shall be applicable to the inside faces of the sheeting.

Except at locations where excavation of rock or unsuitable material is required, care shall be taken not to excavate below the depths specified. When rock is encountered, it shall be removed to a depth six (6) inches below the bottom of the pipe. When the material encountered at subgrade is unstable, excavation shall be continued under the pipe and on each side of the pipe for a distance of six (6) inches beyond the limits of the unstable material. Such rock or unstable material excavation below subgrade shall, be backfilled with sand, bank run gravel, or other suitable materials, compacted to the satisfaction of the Authority's Engineer and/or Inspector, and the bed thus formed and shaped as required above. If trenches in rock excavation are shattered by blasting below or beyond the lines of excavation specified herein, the trench shall be refilled to sub-grade with sand, well tamped earth, crushed stone; or concrete; as required. If earth trenches are excavated beyond the specified depths they shall be backfilled to the proper grade with suitable, thoroughly tamped material at the expense of the Contractor.

2.03 SHEETING, BRACING, SHORING, AND BENCHING

All trench excavation shall be sheeted, braced, shored and/or benched in complete compliance with the REGULATIONS FOR EXCAVATION AND CONSTRUCTION of the STATE DEPARTMENT OF LABOR AND INDUSTRY.

2.04 PIPE BEDDING

All pipe and manholes shall be laid on special bedding material. Bedding shall be minimum of 6" in depth for the width of the trench bottom and shall be AASHTO 67 aggregate, run of bank gravel, or other material approved by the Engineer. Materials not acceptable as bedding include sharp edged aggregate, earth, wet granulated slag, and open hearth slag. Bedding shall be continued up the sides of the pipe to 6 inches above the pipe as shown on detail drawing B8. Bellholes shall be formed to insure that the barrel of pipe will rest for its entire length upon the bedding material.

2.05 PUMPING

The Contractor shall keep all excavations free from water at his own expense while pipe laying work and manhole inspection is in progress, and to such extent as may be necessary while excavation work alone is being carried on. He shall provide for the disposal of the water removed from excavations in such manner as shall not cause injury to the public health, to public or private property, to the work of other contractors, to any

of the work completed or in progress, and produce any impediment to the use of the highways, roads, lanes and streets by the public.

2.06 ROCK EXCAVATION

Unless otherwise directed by the Authority's representative, rock shall be completely removed to the limits specified in Section 2.02 at least 25 feet in advance of pipe laying, and to a point at least six (6) inches below the outer bottom of pipe, and to a width not to exceed the maximum width of the trench, for the size of pipe to be laid therein.

The space below the outer bottom of the pipe shall be filled with #8 aggregate crushed stone or other approved material; free from large rocks or stones, and thoroughly tamped in uniform horizontal layers not thicker than four (4) inches.

Where manholes are excavated in rock they shall be excavated six (6) inches outside the exterior lines of the manhole and to a depth of the outside bottom. (The contractor will be solely responsible for injury to persons, or property that may result from the use of explosives to remove rock.).

2.07 TUNNELLING, JACKING, AND BORING

Tunnels for the laying of pipelines shall be sufficient size to allow at all points the proper joining of pipes, and the proper compacting of the refill around them. Tunnels shall be lined with steel plate where and to such extent as may be necessary.

Where excavation for the sewer is made in tunnel, the prism of material removed, shall conform as nearly as possible to the dimensions specified or shown on the plans. Tunnels in earth shall be properly braced and steel lined in accordance with the most approved methods of soft ground tunneling.

Where steel plate lining is used, the space between such plates and the outer surface of the sewer shall be completely filled with a uniform 1:1 mixture of soil and granular material as defined in Section 206.2(a) of the sewer and the steel lining, or this space shall be filled with concrete if required.

Where jacking method is used, Class 52 ductile iron pipe or 0.375 minimum wall thickness steel casing pipe shall be used as a casing for the required size and type of specified sewer pipe. Although it is not required that the casing pipe be jacked to grade, care must be taken to enable laying the required sewer pipe to grade as shown on the drawings. The sewer pipe shall be laid to grade in the casing pipe on a bed of sand half way up on the outside diameter of the sewer pipe, with all joints made securely. The casing pipe shall be of sufficient strength to withstand the pressures of the soil conditions prevailing.

Tunneling, jacking, and/or boring shall meet the requirements of the agency from which a permit is required.

2.08 EMBANKMENT

Where embankment is necessary to support the foundations of, or to cover the sewer, it shall be made to the height, width and slopes shown on the plans, or as directed by the Authority's representative.

Material for embankment shall consist of all excavation on the project except such material as may be determined unsuitable by the Authority's representative, which includes but is not limited to frozen material, and excessively wet or dry material. Acceptable material shall conform to PennDOT Pub. 408₁.Section 206.2, Embankment Material, or as approved by the Authority's representative.

Embankment material shall be placed in uniform horizontal layers of not more than a loose 8 inch depth for the full width of the required cross section. Each layer, for the required width, shall be compacted to not less than 95% of its modified proctor dry weight density, or as directed by the Authority's representative.

No breaks or irregularities in the distribution of the material or the formation of the layers will be allowed. The whole embankment shall be carried up evenly to the height given by the plans in such a manner as to make a compact and solid foundation. When pipe is to be laid in a fill, the embankment shall be brought to a height at least one (1) foot above the proposed top of the pipe before the trench is excavated. The embankment shall then be excavated to the proper form and grade and the sewer placed thereon; after which the embankment shall be carried up to a height of not less than three (3) feet above the top of the sewer, the materials being placed and rolled or rammed in layers as above described.

2.09 BACKFILLING TRENCHES

After the sewer is laid and bedding placed to 6 inches above the top of pipe, all trenches, except for crossings of roadways, thoroughfares and driveways shall be refilled with clean earth deposited in six (6) inch layers to a height of at least two (2) feet above the top of the sewer in such manner as not to disturb the structure, and solidly rammed down and tamped around the sewer and under it, with mechanical tampers and proper tools made for this purpose. The earth, to the height specified above, shall be carefully thrown in with hand shovels and not pushed in by heavy equipment. Locatable 2 inch foil backed sewer tape shall be placed at this point prior to filling with the trench with the remaining layers. The remainder of the trench shall then be refilled to the required height in layers, each layer not to exceed one (1) foot in thickness. Trench rollers and/or mechanical tampers shall be used to compact each layer to not less than 95% of its modified proctor dry weight density or as directed by the Authority's representative.

The earth or sand shall be properly rammed as directed, and wetted as required as the work progresses. Care shall be taken to carry the fill up evenly on opposite sides of the sewer. In lieu of hand tamping the initial lift, two feet of 2A aggregate can be used.

If, in the opinion of the Authority's representative, the material used for refilling is of such character that satisfactory results cannot be obtained by tamping or ramming the contractor shall refill and puddle the trenches in such manner and at such time as the Authority's representative may direct.

If the material excavated from the trench is not clean earth, as above specified, the best of the materials excavated shall be used in backfilling, in position and manner as directed by the Authority's representative. Frozen materials shall not be used for backfilling.

In rock trenches, good gravelly earth shall be provided and refilled in the manner hereinbefore described, to a height of two (2) feet above the top of the sewer. The refilling

for the balance of the trench in all cases. shall be of good earth, sand or gravel, which may contain stones not more than ten (10) inches in largest dimensions, but not in proportion exceeding one (1) part stone to three (3) parts earth.

No bulkheads or retaining walls for the refilling will be allowed in the trenches over the sewer, except for temporary use.

For backfilling all trenches across all paved and unpaved roadways, thoroughfares and driveways, granulated slag or other approved non-compressible backfilling material shall be used. The backfilled surfaces shall be maintained flush with the adjacent undisturbed surfaces. Stockpiles of the select material used for backfilling crossings shall be strategically located in the project area to be used for maintaining all backfilled trenches along or across roadways. Temporary surface requirements are covered in Article 13 of this Section. For final resurfacing of paved areas, the requirements of the Section entitled "REPLACEMENT OF PAVING" shall govern.

As the trenches are filled in and the work completed, the Contractor shall, at his own cost and expense, remove and dispose of all surplus earth, stone, slag, or other material from the work, in such manner and at such point or points, as he may select or provide, subject to the approval of the Authority's representative, or he may deposit the same, either with or without rehandling, at any point or points on the lines of the work covered by the Contract, if so desired by the Authority's representative, and shall leave all roads, sidewalks and other places free, clear and in good order. In case the Contractor shall fail or neglect to do so, or to make satisfactory progress in doing so, within twenty four (24) hours after the receipt of a written notice from the Authority, the Authority may remove such surplus material and clean the roadways, sidewalks and other places, and the cost of said work shall be charged to the Contractor and deducted from the deposit money provided by the Contractor. An electronically locatable marking tape shall be laid in the trench as described in Section III.

2.10 RESTORATION OF PRIVATE PROPERTY

Upon completion of all compacted backfilling of non topsoil excavation, the topsoil previously removed and stored shall be replaced and mounded over the backfilled area. Immediately upon backfilling of the trench for the entire length over each individual property, the entire disturbed area of this property shall be cleaned of all debris, graded and fine raked. Thereafter, all shrubbery, hedges, fences, walkways, etc. shall be replaced to a condition equal to that before construction. Reseeding of the backfilled area within the reasonable limits to tie construction is required. However, the careful replacement of the top soil, the prompt cleanup and raking of the construction area on each property, the complete replacement of all removed surface items and the continued maintenance of the top surface of the trench shall be strictly enforced. In the event that the trench surface compacts in some places lower than the original grade, these areas shall be refilled with topsoil, whether or not available on the property upon which the depression occurs. The Contractor shall be required to periodically inspect all mounded areas of backfill and repair and maintain these areas as necessary until no further comp action results. Reseeding and mulching must be done within twenty (20) days of backfilling, weather permitting. Hydroseeding methods are acceptable. Four (4) inches of approved topsoil should be placed on all excavated or disturbed areas, which had previously been mowed as a lawn. Before seeding, the topsoil shall be loosened to a depth of at least two (2) inches, and raked to remove all large stones. Lime shall be applied to the surface at the rate of 100 lbs. per

1,000 square feet of area; lime shall be applied, fertilizer shall be applied at the rate of 50 lbs. per 1,000 square feet; fertilizer shall be a complete commercial fertilizer with an analysis of 5105. Seed mix shall be as follows:

38.5%	Kentucky Bluegrass	10.30%	Annual Rye
24.75%	Creeping Red Fesque	5.05%	Red Top
10.80%	Perennial Rye	10.60%	Inert Matter

Seed as manufactured by Seaboard Seed Company; or Stanford Seed Company. Seed shall be applied at the rate of 1 lb per 200 square feet. The seed shall be raked or brushed in the area covered with 1/4 of peat moss. The Contractor shall be responsible for a good stand of grass and shall do the required watering and reseeding.

All restoration work shall be guaranteed by the Contractor for a period of eighteen months from date of final completion and acceptance. In the event that any improvement or correction of such restoration work is as deemed necessary by the Authority's representative not complied with by the Contractor within a reasonable period of time stipulated by the Authority, in their, notice of such condition to the Contractor, the Authority may have such work done by others with costs of said work to be charged to the Contractor and deducted from deposit money provided by the Contractor.

For areas to be paved or used as unpaved thoroughfares, the requirements of the preceding Article of this Section concerning the use of granulated slag backfill shall be followed. The requirements for final surface preparation or all paved areas are covered under the Section entitled, "Replacement of Paving".

2.11 TEMPORARY PAVING AND RESTORATION OF UNPAVED TRAVELED AREAS

In all paved areas other than State Highways and in all unpaved areas used as thoroughfares, road shoulders, driveways or parking areas, the Contractor shall provide over all backfilled excavations a temporary paving consisting of a layer of crushed stone conforming in grading requirements to three (3) inch coarse aggregate, which shall be eight (8) inches in depth after approved compaction.

The stone shall be spread on a thoroughly tamped subgrade and shall be rolled with a ten-ton roller until there is no evidence of further compaction or settlement. There shall then be spread over the coarse material successive layers of fine material conforming to

Passing #100 Screen	10	30%
Passing #4 Screen	85	100%
Passing 3/8" Screen		100%

Each layer shall be broomed in and rolled until all voids. are filled. Following the application of the fine material, the surface shall be sprinkled with. water and rerolled thoroughly, additional fines being added as needed to fill all voids. The completed surface shall be flush with or slightly crowned above the adjacent pavement as directed.

2.12 PROTECTION OF PROPERTY AND STRUCTURES

The Contractor shall, at his own expense, sustain in their places, and protect from the direct or indirect injury, all pipes, tracks, walks, buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, etc. on the ground and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.

The Contractor shall take all risks attending the presence or proximity of pipes, poles, tracks, walls, building and other structures and property, of every kind and description, in or over these trenches, or in the vicinity of his work, whether above or below the surface of the ground; and he shall be responsible for all damages and assume all expense for direct or indirect injury, caused by his work to any of them, or to any person or property by reason of injury to them, whether such structures are or are not shown on the drawings.

The Authority reserves the right under such conditions to stop the excavation or any other part of the work, and to require the Contractor to complete the sewer and the backfilling up to such a point as the Authority's representative may direct before proceeding further with the excavation, and the Contractor shall not thereby become entitled to demand or to receive any allowance or compensation, from the Authority.

2.13 TEMPORARY PAVING AND MAINTENANCE OF SURFACE

The Contractor shall crown the top of all unpaved areas, except where thoroughfares. The Contractor shall surface the following gradation: the backfilled excavations in such areas are used as also maintain these crowned.

In all paved areas and in all unpaved areas used as thoroughfares, the Contractor shall provide a temporary paving over a backfilled excavations. This shall consist of a layer of crushed stone, which shall be six (6) inches in depth after approved compaction.

The Contractor shall also maintain these temporary pavings from the time of temporary paving operations, until permanent pavement is placed thereon.

The crossing or paralleling of any thoroughfare can only be done, after the proper government agencies are notified.

2.14 ACCOMODATION OF DRAINAGE

Gutters, sewers, drains and ditches shall be kept open at all times for surface drainage.

No damming or ponding of water in gutters or other waterways will be permitted, except where stream crossings are necessary and then only to an extent which the Authority's representative shall consider necessary. The Contractor shall not direct any flow of water across or over pavements except through approved pipes or property-constructed troughs, and he shall when so. required, and at his own cost and expense provide pipes or troughs of such sizes and lengths as may be required and place the same as directed. The grading in the vicinity of sewer trenches shall be controlled so that the ground surface is properly

pitched to prevent water running into the trenches. Sch. 40 PVC with Fernco or similar approved flexible couplings shall be used to repair 3" and 4" drains disturbed by excavation.

2.15 EXPLOSIVES AND BLASTING

The Authority's representative shall be empowered to regulate the character and strength of explosives used, and the manner of their use and storage. Only small amounts of explosives shall be kept at any place and they shall be kept under lock, the key to be only in the hands of a trustworthy person. Great care shall be taken in handling dynamite and similar explosives during freezing weather. Caps and exploders shall not be kept in the same place as explosives. Blasts shall be properly matted and securely covered.

The Contractor shall be solely responsible for injury to persons or property that may result from his use of explosives, and the exercise of, or failure to exercise control on the part of the Authority's representative shall in no way relieve the Contractor of responsibility for injury or damage resulting from their use.

All blasting shall be done under the supervision of a competent licensed blasting expert, and subject to the Commonwealth, county, or local regulations for blasting.

A copy of the blaster's log will be submitted to the Engineer for each day's blasting. This copy is to be submitted at the end of the day's work. It will indicate the time of the shot, number of holes, depth of holes, size of charge in each hole, type of detonator used. Results of each shot will be noted, along with any reports of damage, either on the right of way or to surrounding properties.

Where there is any possibility of damage from ground waves occurring to adjoining properties, the Contractor will provide for the use of a recording seismograph at his own expense if so requested by the Authority's representative. Records taken from the machine will be attached to the reports of the shots and submitted to the Authority.

SECTION III PIPE MATERIALS AND INSTALLATION

3.01 GENERAL

Included here are the specifications for the installation of all sanitary pipe sewers.

3.02 MATERIALS

Sewer pipe shall consist of sections of pipe of the diameter and jointing materials shown on the drawings or specified, and conforming to the most recent editions of the applicable standards for the following:

A. Ductile Iron Pipe

Ductile iron pipe, centrifugally cast in metal molds or sandlines molds for water or other liquids, shall conform to ASA A21.51 (AWWA C151).

All ductile iron pipe furnished shall be coated inside and outside of the pipe with coal tar pitch varnish applied hot, all in accordance with A.N.S.I. Specification A21.51. The wall thickness and class shall be modified to conform to the A.N.S.I. standards and pipe class for the depth of pipe cover encountered. The Contractor may use 12 or 18-foot lengths or any reputable manufacturer's standard lengths at his option and in such quantities as he may elect unless otherwise indicated on the approved drawings.

All joints for bell and spigot cast. iron pipe shall employ a single elongated grooved gasket to effect the joint seal similar to the "BellTite" or "Tyton" types. Gaskets shall be manufacturer's standard, suitable for the fluid conveyed or the purposes intended.

Bell and spigot fittings shall comply with A.N.S.I. A21.51 Specifications for Ductile Iron Pipes and Special Castings. Fittings shall be A.N.S.I. C22 bell and spigot pattern as required for sizes up to and including 12 inches. The use of short body fittings conforming to A.W.W.A. Specification C110 will be allowed. Standard fittings shall be used unless otherwise indicated by the Engineer. Fittings shall be used on all bends or angles either vertically or horizontally where the deflection exceeds the maximum allowable deflection under A.W.W.A. Specifications. Fittings shall be coated inside and outside with coal tar pitch varnish applied hot. Fittings shall be anchored or blocked as detailed on the drawings. Fittings for use with gasket joint bell and spigot pipe shall be all standardized mechanical joint fittings or all bell and spigot fittings with poured joints. Linings and coatings shall conform to the types specified for the pipe to be used.

Gaskets for use with gasket joint bell and spigot pipe shall be manufacturer's standard suitable for the fluid conveyed or the purposes intended.

Gaskets for use with mechanical joint pipe shall be plain rubber made of a vulcanized crude rubber compound, which in turn shall be made from a first grade plantation rubber.

Bolts and nuts shall be high strength, heat treated cadmium plated steel tee head bolts with hexagonal nuts.

B. Truss Pipe (ASS or PVC)

All truss composite pipe shall conform to ASTM Specifications D1784 with a minimum cell class of 12454B. Cells shall be filled with perlite concrete per ASTM D2680. The

pipe manufacturer shall submit certification. The pipe shall be tested for stiffness and deflection by a testing laboratory. Not less than one (1) length of pipe for each two hundred (200) lengths furnished nor less than two (2) lengths shall be tested. The costs for all testing shall be included in the costs for the pipe. The pipe shall be installed in strict accord with the manufacturer's recommendations and ASTM D2321 by experienced personnel. The manufacturer shall furnish a representative to remain on the job site at the start of installation for a sufficient time to school or instruct the workmen of the proper installation procedures. Joints shall be of the solvent weld type. P.V.C. truss pipe is also acceptable.

Pipe of six (6) inch diameter or less shall be of the solid wall ASS resin or PVC and pipe of eight (8) inch and larger diameter shall be of the extruded truss with voids filled with lightweight concrete. Adapters designed for the specific purpose shall be used to connect pipes of different materials.

A manhole water stop gasket and clamp assembly shall be installed around the pipe when entering and leaving a manhole.

Deflection testing shall be conducted on all pipe at least 30 days after backfilling. This testing shall be conducted in conjunction with and at the same time the pipe sections are being air tested. Testing for deflection may be done by an approved GO/NOGO device. Any sections of pipe in which deflection exceeds 5% shall be unacceptable and shall be replaced by the Contractor at his expense. A sample "Sewer Deflection Test Report" form used by the Authority is included for reference in Appendix C.

At each wye the Contractor shall furnish adapters to connect the ASS or PVC truss pipe to the connecting sewers.

C. P.V.C. Pipe

The Polyvinyl chloride gravity sewer pipe shall conform to ASTM D 3034, (SDR 35) or ASTM F78982. The pipe and fittings shall have integral wall bell and spigot joints with rubber ring joints. The pipe stiffness shall be in accordance with ASTM designation 0 2412, with a minimum "stiffness factor" $(F/A y) = 46$.

Installation requirements and testing procedures for PVC gravity sewer pipe shall be the same as for PVC truss pipe. Type PS46 PVC shall use T3 resin, compound classification 12164A.

All PVC pipe shall be kept covered to protect it from ultraviolet rays of the sun, which have a deleterious effect on the plastic compound.

D. Concrete

Classes of 408, Section cement concrete shall be as specified 704.1 (g). PennDOT Pub.

Class A cement concrete shall be used for footings and slabs on grade, and shall develop a minimum 28 day compressive strength of 3300 psi.

Class 6 cement concrete shall be used for pipe foundations and encasements, and shall develop a minimum 28-day compressive strength of 3000 psi.

Class C cement concrete (2000 psi) shall be used to fill cavities up to subgrade where required:

E. Crushed Stone Cradle

Shall be composed of crushed stone conforming to the Pennsylvania Department of Transportation grading and quality requirements for No. 8 course aggregate.

F. Marking Tape

Electronically, locatable brightly colored plastic tape displaying the printed notation "sanitary sewer" shall be laid between backfilling lifts over the pipe two feet above the pipe. In no event shall the tape be more than four feet below the finished ground surface.

Tape shall be 2" minimum in width.

3.03 CONSTRUCTION METHODS

A. Laying Pipe

Following the trench preparation, pipe laying shall proceed upgrade with the pipe laid carefully, hubs upgrade, spigot ends fully entered into adjacent hubs, and true to lines and grades given. Every pipe shall be carefully inspected before laying and any containing cracks or defects shall not be used. Sockets shall be carefully cleansed before pipes are lowered into trenches. The pipes shall be so lowered as to avoid unnecessary handling in the trench. Each section of pipe shall rest upon the pipe bed for the full length of its barrel. Each pipe shall be firmly held in position so that the invert forms a continuous grade with the invert of the pipe previously placed and true to the lines and grades staked. The interior of all pipe and the inside of the bell and outside of the spigot shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by means of plugs or other approved devices. Under no conditions, shall pipe be laid when trench conditions are unsuitable for such work. In all cases water shall be kept out of the trench until joints have been made and concrete cradles or supports, where used, have set. Walking or working on the completed pipeline, except as may be necessary in tamping or backfilling, shall not be permitted until the trench has been backfilled to a height of at least two (2) feet over the top of the pipes. Any pipe that has grade or joint disturbed after laying shall be removed and re-laid. Any section of the pipe already laid and found to be defective, shall be removed and replaced with new pipe. Prior to acceptance of the sewers, the Authority may survey the installation to ascertain conformance to approved plans and specifications. An electronically locatable marking tape shall be laid in the centerline of the trenches as described in the previous paragraph.

B. Joints

All joints shall be watertight and any leaks or defects discovered shall be immediately repaired. After joints are made, any superfluous material inside the pipe shall be removed by an approved follower or scraper. All particles of dirt or stones shall be removed from the parts to be jointed. Installation of sewer pipe shall be in strict conformance with the manufacturer's written specifications.

C. Laterals

Wye or tee branches shall be installed at the locations indicated on the drawings. In general connections to mains shall be made with commercially manufactured branches, (1/8") bends, and (1/4") bends. Cutting of pipes will not normally be permitted. Wye or tee

branches shall be set at such vertical angles as required to bring the service connection to the proper depth.

The developer shall install the lateral from the sewer main to the property line if he builds the sewer main or if a wye or tee branch already exists. Either the developer or the property owner shall install the connecting sewer from the property line to the building (See Appendix E).

To provide for the ease of tap location, a treated 4" x 4" lumber shall be inserted into the ground to the depth of the tap and exposed above ground a minimum of 3 feet. Green paint shall be used to mark the exposed piece of lumber. The depth to the lateral and lot number should be clearly marked on the exposed portion of the lumber.

If the sewer main is not installed by the developer and no wye or tee branch exists, the responsibility rests with the property owner to install the lateral and the connecting rigid saddle under the observation of the Authority's representative.

D. Stoppers

When service lines are not completed to buildings, or when connections are not made to wye branches at the time the service lines or mains are laid, the upper, free end of such service lines or branches shall be provided with a carefully fitted stopper of the same material of the pipe and having a joint of the same type as that on the pipe and pipe fittings such that the stopper will be securely placed and the connection will be watertight.

E. Concrete Foundations

Where required by the approved drawings, pipes shall be placed on a formed concrete cradle, or unformed concrete shall be placed around pipes for anchors, bedding and encasement. Concrete anchors or cradles shall consist of structures composed of concrete built in trenches to support pipes and to the dimensions shown on the drawings. Concrete bedding and encasement shall be composed of concrete placed in trenches without forms as pipe bedding, or encased around pipes, to the dimensions, and in the locations indicated on the drawings.

F. Infiltration

All obvious leaks in the line and in the manhole under test shall be repaired. No compensation will be paid the Contractor for providing all labor, materials and necessary appliances for making infiltration tests.

G. Air Testing

The installation of all gravity sewers and force mains shall be tested in the field, in the presence of the Authority's Engineer or his authorized representative in the manner prescribed in the sections of these specifications pertaining to such installation tests. The Contractor shall bear all costs thereof. All equipment for air testing shall be furnished by the developer.

In addition to the requirements of the preceding Article on "Infiltration, the Contractor shall perform an air test on each and every section of sewer construction as an acceptable test. The test shall be made by tightly capping all stubs, wyes, tees and pipe ends, cleaning the line, plugging the ends, and placing the section being tested under air pressure. At the start of the test, the air pressure is raised to four PSIG greater than the average backpressure of any ground water. After two minutes or more, during which the

air temperature is stabilized, testing is started at a pressure of 3.5 PSIG above groundwater pressure. The Contractor may elect to assume that groundwater is at grade in lieu of providing a standpoint arrangement acceptable to the Authority's representative for measuring the location of groundwater. The time required for the pressure to drop from 3.5 to 2.5 PSIG is determined and used as the basic measurement of the test. The section of pipe being tested shall be accepted if that section does not lose air at a rate greater than 0.003 CFM per square foot of internal pipe surface. This requirement shall be met if the time required for the pressure to drop.

From 3.5 to 2.5 PSIG (greater than the average backpressure of any groundwater over the pipe) is not less than the following Time Allowed for One PSIG drop.

Pipe Size (inches)	Minutes
6	2
8	4
10	5
12	5.5
15	7.5
18	8.5
21	10.0
24	11.5
over 24	15.0

The Contractor is cautioned that the wyes, tees or service connections must be tightly plugged and blocked to eliminate air leakage, which will result in an unsatisfactory air test. Wyes, tees, or service connections which are not plugged satisfactorily shall be excavated and re-plugged by the contractor at this expense

H. Visual Inspection

All sewers shall be visually inspected by the Contractor's representative with all necessary materials and assistance to be supplied by the Contractor. Upon looking in one end of a pipe a full circle of light must be visible at the other end of pipe when lamped. If irregularities in alignment are such that the slope of any section of pipe is less than 0.5%, that total run of sewer between manholes will be removed and re-laid.

I. Drop Connections

The Contractor shall build drop connections where shown on the approved drawings, and in conformity with the drop manhole details shown on pages B5, B6 & B7.

J. End of Pipe to be Protected

For any period when construction of a sewer line is interrupted, the end of the last section of pipe laid shall be provided with a stopper, carefully fitted to the pipe, to prevent earth or other substances from washing, into the pipe.

SECTION IV MANHOLES

4.01 GENERAL

Manholes shall be built at such points as shown on the approved plans, and at every change in line or grade.

Tie-ins to existing manholes are to be core bored whenever possible and a core and seal boot installed.

4.02 MATERIALS

A. Pre-cast Reinforced Concrete Sections

Walls of manholes shall be constructed of reinforced concrete ring sections. The risers and top sections shall be manufactured in compliance with the requirements of Specifications for PreCast Reinforced Concrete Manhole Risers and Tops, ASTM Designation C 478. Riser sections shall have tongue and groove ends and a minimum wall thickness of five inches. Top sections shall be of concrete cone or flat slab top design as required by the Drawings. Concrete cones shall have the same minimum wall thickness and area of circumferential steel reinforcement as the round riser sections. Flat slab tops shall have a minimum thickness of six inches (6") and shall be reinforced with steel in accordance with the design requirements specified in ASTM Designation C478. Top sections shall have a top width of such design and dimensions as to properly support the required manhole frame and cover and the lower joint shall be of tongue and groove design.

B. Manhole Frames and Covers

Castings for frames and covers for manholes shall be composed of best quality, tough, gray iron, free from cold shuts, blow holes, and other imperfections, and shall meet the requirements of ASTM Designation A 48 for Class No. 30. The castings shall be sound, true to form and thickness, cleaned by means of sand blast and neatly finished. Castings shall receive one coat of black asphaltum paint at the factory. The type and design of the frames and covers shall be as shown in Appendix B. Unless otherwise specified, all end of line covers shall be vented and all other covers shall be solid and unvented.

C. Manhole Steps

The type and design shall be as shown on the Drawings. Manhole steps shall be cast into the walls of the riser and conical top sections and be aligned vertically and spaced so as to be on equal centers in the assembled manhole at a maximum distance apart of twelve inches (12").

D. Concrete

Manhole bases shall be Class A concrete as described in Paragraph 3.02 E of the section entitled "Pipe Materials and Installation".

E. Cement

Cement used in manholes shall consist of one part cement, two parts sand, water and two pounds of Cemex Integral waterproofing powder per bag of cement.

4.03 CONSTRUCTION METHODS

A. Excavation and Backfill

Excavation and backfill shall conform to the applicable requirements of the section "Excavation, Backfill and Embankment."

B. Concrete Bases

For all manholes on new sewers only pre-cast concrete "mono base" manholes with integral rubber boot couplings will be permitted such as "INTERPACE BOOT", "KORNSEAL", or equal.

Inverts shall be formed with grout in the manhole base, and shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer sections. Changes in size and grade shall be made gradually. Changes in the direction of the sewer and entering branches shall have a true curve of as large a radius as the size of the manhole will permit. The lower half of the channel shall be a true semicircle, the sides of the channel to extend vertically to the height of the top of the pipe.

All manhole bases shall be laid on a minimum of 6" special material. Bedding material shall be as described in the "Excavation, Backfill and Embankment. bedding section.

C. Manhole Sections

All pre-cast concrete ring sections and top sections shall fit together readily to permit effective jointing. Joints between adjacent sections of all manholes shall be made with rubber gaskets conforming to ASTM C 443. Particular care shall be taken to secure a watertight joint between the bottom riser section and the concrete base. Pipe connections to manhole walls shall be made in such a manner as to secure a watertight and neat connection. Adjoining riser and conical top sections shall be fitted together in such a manner as to assure true vertical alignment of manhole steps. A minimum 1" diameter mastic joint sealant material such as "Kent Seal" is to be used placing "Kent Seal" on both the inner and outer lips of the manhole section.

D. Frames and Covers

Frames and covers shall be set to correct elevation on Kent seal or Conseal. Where required, final adjustment of frame to elevation shall be by means of brick masonry; no more than three courses of brick shall be used.

All manhole frames shall be bolted to the top section of the manhole with at least two cast iron anchor bolts. End of line manholes to have vent hole, all other manholes to be unvented.

4.04 TESTING

A. Exfiltration Test

All manholes shall be tested by exfiltrating with water. Each manhole shall be completely filled with water for a period of 16 hours prior to commencement of the exfiltration test and at that time the volume of the manhole in gallons is recorded by the Contractor in the presence of the Authority's representative. At the start of the test, the water level shall be as close as possible to the top of the manhole. This level shall be maintained during the eight-hour test period and the quantity of water necessary to maintain the level shall be reported as the test results. The allowable loss through the saturated manhole barrel equivalent to 100 gal/inch/mile/day equates to 0.06 times the volume of the manhole expressed in gallons. All

costs of testing including plugs, water, labor and supervision shall be borne by the Contractor. A sample "Manhole Exfiltration Test Results" form used by the Authority is included for reference in Appendix C.

B. Vacuum Testing

1. Each manhole shall be tested after backfilling and installation of dog house.
2. All lift holes shall be plugged with an approved non-shrink grout.
3. All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole.
4. The test plate shall be placed on top of the casing ring and the vacuum applied in accordance with the manufacturer's recommendations.
5. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds for 48" diameter, 75 seconds for 60", and 90 seconds for 72" diameter manholes.
6. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout. The vacuum should be removed while repairs are made. Retesting shall proceed until a satisfactory test is obtained.

SECTION V - REPLACEMENT OF PAVING

5.01 GENERAL

Street paving, or private driveways, and gutters, where broken into, shall be restored by the Contractor and shall be repaved or rebuilt using the same type of paving material as was in the original or in accordance with Detail B17 where applicable.

5.02 MATERIALS

All bituminous surface course used in work covered by this section of the specifications, shall conform to the current applicable requirements of the Pennsylvania Department of Transportation specifications, as a standard. All other materials used in work covered by this section of the specifications shall be of a quality, at least equal to that of the present construction.

All concrete used in connection with work under this section shall conform to the Pennsylvania Department of Transportation specifications.

5.03 CONSTRUCTION METHODS

The Contractor shall do all the final resurfacing or repaving of streets, driveways and gutters over excavations that he has made; and he shall be responsible for relaying paving Surfaces of roadbed that have failed or been damaged.

At joints between existing pavements and repaving work, the edges of the existing pavements shall be saw cut parallel with the trench in straight lines and right angles, neatly trimmed.

On all thoroughfares, all repaving or resurfacing shall be done in accordance with the standard requirements of the Pennsylvania Department of Transportation for all road and street areas affected, or in accordance with such other methods as may be prescribed by the Pennsylvania Department of Transportation.

The Contractor is alerted that he must obtain a road opening permit or occupancy permit from either the Municipality, County or State depending on which of these levels of government has jurisdiction prior to the construction of sewers or service connections in a road right-of-way. The Contractor shall also post any bonds required by the governmental department or agency having jurisdiction.

* The Contractor shall include maintenance of paved areas in the eighteen month maintenance bond.

SECTION VI - FORCE MAINS

6.01 GENERAL

In here are the specifications for the installation of force mains from sewage pumping stations and from sump pump installations.

6.02 MATERIALS

Pipe for force mains shall be Ductile iron or PVC pipe conforming to the specifications found in Section III Materials.

6.03 CONSTRUCTION METHODS

Force mains shall be laid in trenches with minimum cover of 4 feet. Maximum trench width at the top of the pipe shall be no greater than the outside diameter of the pipe plus two feet. Pipe shall be laid directly on a trench bottom containing bell holes and shaped to provide continuous support for the bottom quadrant of the pipe between bell holes.

Where rock is encountered, the trench bottom shall be excavated six inches below the bottom of the pipe and backfilled with a non-compressible material. Selected backfill material free from rocks or boulders shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench in tamped layers and to an elevation of at least one foot above the top of the pipe.

All bends in excess of 10 degrees horizontal or vertical and all plugs, caps, tees and wye branches along the force main shall be blocked with Class C-concrete poured solidly between the pipe and the firm trench wall. For details of anchoring and blocking see Appendix "B", Detail Sheet B15.

Force mains shall be subjected to a water pressure test. Test pressure shall be 10 psi in excess of the maximum shut off head of the pump, which will be discharging to the force main. Test pressure shall be maintained for a period of not less than two hours.

The amount of water required to be pumped into the force main to produce the pressure specified above shall be measured. The test pressure shall be 1.5 psi multiplied by the design working pressure of the pumps.

SECTION VII - PUMPSTATIONS

7.01 SCOPE

The intent of this section of these specifications is to provide a standard of quality for the materials and installation of pump station facilities and not to specify certain types of pump stations or equipment as the most suitable selection of pump station and equipment types will vary with each project. Each design therefore, will be reviewed by the Authority's Consulting Engineer. The principal items of equipment in each pumping station may include, but not be limited to, motor driven non-clog sewage pumps, valves, internal piping, influent strainer basket, motor starters and automatic pump controls, lighting, sump pumps, ventilator, dehumidifier, engine driven standby generator, automatic transfer switch, control panels, and wiring.

7.02 GENERAL

The Contractor shall furnish a pump station installation with all structures, fencing, roadways, piping, equipment, machinery, apparatus, motors, drives, controls, wiring, tools, charts, and all other items necessary for a complete and operable installation.

All requirements of the Pennsylvania Department of Environmental Resources shall be met in the design and construction of the pump station, including those guidelines given in the "Sewage Manual", Section 30.

A. Lubrication

On all equipment ample means of lubrication shall be provided for all bearings and other metal parts in sliding contact. A lemite industrial type fittings, or approved equal, shall be used for grease lubrication. All lubricant and fuel necessary for initial operation and tests and suitable grease pressure guns shall be furnished by the Contractor.

B. Installation

All equipment shall be installed by skilled mechanical erection labor in accordance with the instructions of the manufacturer, and such installations shall be inspected, adjusted, approved and certified by the manufacturer in writing to the Contractor, and a copy placed on file with the Authority and the Authority's Engineer.

C. Shop Paint

All ferrous metal on equipment, unless otherwise specified or directed by the Authority's Engineer, shall receive shop paint compatible with field coats provided by the Contractor, in accordance with the requirements of the Section entitled "PAINTING".

D. Motors

All motors shall conform to the standards of the American Institute of Electrical Engineers (AIEE) and the National Electrical Manufacturers Association (NEMA) for their respective classes and shall perform the work intended without undue wear and undue heating.

7.03 SHOP DRAWINGS AND OTHER DATA

The equipment supplier shall furnish for approval, completely dimensioned shop, layout or setting drawings and cuts or other data was required to provide a complete description of

all equipment specified herein, including certified test curves for all pumps through the full operating range of the pumps. Certified copies of the pump performance tests run in the factory shall be submitted to the Authority's Engineer for approval prior to pump delivery. Notice of the performance tests shall be given to the Engineer seven (7) days prior to the test date. Shop drawings shall be certified for construction by the manufacturer and shall include, but not be limited to, electrical wiring diagrams, weights of principal parts, diameter of shafting, details, sizes, dimensions and rated horsepower of all motors, gears and controls, all dimensions necessary for assembly and erection, and the weights of completely assembled equipment.

Complete, written, detailed erection, operation, and maintenance instructions shall be furnished by the Contractor to insure proper training and instruction of the Authority's personnel.

The Contractor shall furnish the services of competent manufacturer's representatives for not less than one (1) man-day to instruct the Authority's personnel in the maintenance and operation of the respective items of equipment. These services shall be made available following the initial operation of the completed facility and shall be over and above any services necessary during erection or necessary to correct defective materials or workmanship during the eighteen (18) month guarantee period.

7.04 MATERIALS

A. Concrete

- 1) All concrete shall be PennDOT Class "A" unless otherwise noted. (4,000 PSI)
- 2) Precast Reinforced Concrete Sections shall be furnished and installed in accordance with Section IV - Manholes, except for the Manhole joints. Joints between adjacent sections shall be sealed with butyl rubber sealants. Sealants shall be Con Seal CS302 as manufactured by Concrete Sealants, Inc. or equal.
- 3) The Contractor shall coat the outside of concrete structures below grade with Thoroseal or similar product to insure watertightness.

All exterior concrete surfaces such as pump stations, valve pit or generator slabs shall be "float" finished.

B. Masonry

- 1) Mortar, Portland cement, sand, lime, water, and grout shall be as noted below:
 - a. Masonry Cement: ASTM C91 Type II
 - b. Portland Cement: ASTM C150 Type II
 - c. Sand: ASTM C144; damp, loose and clean
 - d. Hydrated Lime: ASTM C207, Type S
 - e. Water: Clean and free of deleterious matter.
 - f. Admixture: No air entraining admixture or antifreeze compounds to lower the freezing point will be permitted without permission by the Engineer.

Materials, which have become unsuitable for good construction shall not be used. Brands of cementitious materials and source of supply of sand shall remain the same throughout the entire project and shall not be changed without the Authority's written permission.

- 2) Facing brick when applicable to the project shall be selected by the Authority and shall conform to the requirements of ASTM Specification C216 grade SW for brick in contact with earth and grade MW elsewhere. Standard size 35/8" x 21/4" x 8".
- 3) Concrete Masonry units shall conform to ASTM C90 Type I, Grade N for hollow load bearing units.
- 4) Wall ties shall be galvanized corrugated sheet metal, 7/8" x 8", 20 gage.

C. Metals

- 1) All anchor bolts shall be stainless steel (Type 316).
- 2) Ladder rungs for use in concrete walls shall be made of aluminum.
- 3) Aluminum railings, posts, and formed elbows shall be formed from extruded 6063, 1 1/2" schedule 0.40 aluminum pipe. Railing shall have clear, factory finished, anodized finish. All other aluminum parts shall be fabricated 6063 or 6061 extruded aluminum. All fittings except bases shall be one-piece extrusion machined to final shape. Railing and posts shall be assembled by means of stainless steel fasteners. Blind rivets, self-tapping screws, and all other fasteners shall be 305 stainless steel. All brackets and fasteners shall be coated with asphaltic paint to prevent direct contact between dissimilar surfaces.
- 4) Stair nosings to be manufactured of aluminum base with abrasive inserts and integral concrete anchors. Color as selected from manufacturer's standards by Authority.

7.05 CONSTRUCTION METHODS

A. Excavation and Backfill

Material for "selected compacted fill" shall be granular, clean and free of clay and organic matter. This material shall be placed in three-inch layers and compacted to a density of at least 97 percent of the maximum density based on ASTM Method 0155758T. Selected compacted fill material shall be moistened or dried as necessary to bring it to the optimum moisture for compaction. Compaction shall be by a three-wheel power roller of not less than ten tons or by approved sheep foot tamping rollers.

In cases where the amount of embankment exceeds the amount of excavation within the limits of the site as indicated by the Approved Drawings, and where material is not available from other sources, the Contractor shall obtain sufficient suitable material from borrow pits located entirely beyond the limits of the site. The Contractor shall notify the Engineer sufficiently in advance of borrow necessity, and to view the proposed borrow pit. No allowance will be made for embankments made from material excavated from a borrow pit or area that has not had the Engineer's approval. Borrow obtained from within the site shall be removed to uniform lines and grades satisfactory to the Engineer, and in such a manner as will not detract from the general appearance of the improvements and shall not create unsatisfactory conditions. All borrow pits shall be stripped of brush, roots, grass and other vegetation prior to removal of material for embankment purposes. The Contractor will be entirely responsible for obtaining the necessary

borrow pits and for compensating the owner thereof. Where structures such as a valve pit or brick wall have foundations bearing on fill the entire area must be filled at least 3 feet above the proposed bearing elevation, then the fill removed to the required elevations.

B. Concrete

- 1) Exposed concrete surfaces shall be true and even, free from open or rough areas, depressions or projections. Concrete in all walls shall be brought to the required elevation, struck off with a straight edge and floated. Mortar finishing will not be permitted.

C. Masonry

- 1) General masonry:
 - a. Shall be plumb, true to line, with level courses accurately spaced, and built to the thickness and bond pattern indicated or specified. Where no pattern is indicated, masonry shall be laid in running (center) bond pattern. Masonry units shall be dry when laid. Each unit shall be adjusted to final position in the wall while mortar is still soft and plastic. Any unit disturbed after mortar has stiffened shall be removed and re-laid with fresh mortar. Anchors, wall plugs, accessories, flashings, and other items to be built in shall be, installed as the masonry work progresses. All cutting and fitting of other sections shall be done by masonry mechanics with masonry saws.
- 2) Mortar
 - a. Measurement of materials shall be such that the specified proportions are controlled and accurately maintained. Workability or consistency of mortar on the board shall be sufficiently wet to be worked under the trowel. Water at tempering shall be available on the scaffold at all times. Mortar, which has begun to "set" or is not used within two and one-half hours after initial mixing shall be discarded. Mortar which has stiffened due to evaporation within the two and one-half hour period shall be re-tempered to restore its workability. Re-tempering the mortar at the mixer shall not be permitted.
- 3) Mortar Bedding and Joints
 - a. Hollow units shall be laid with full mortar coverage on horizontal and vertical face shells, except that webs shall also be bedded in all courses of piers, columns, and pilasters, and in the starting course on footings and solid foundation walls, and where adjacent to cells or cavities to be reinforced and/or filled with grout or concrete.
- 4) Weather Requirements
 - a. Do no masonry work when the temperature is below 40 degrees Fahrenheit without the Engineer's written permission. When freezing temperature is expected within 3 days, follow procedures outlined in Brick Institute of America (formerly Structural Clay Products Institute) "Technical Notes" on cold weather masonry construction.
- 5) Cleaning of exposed masonry walls shall be accomplished by washing with clean water only, using fiber brushes.

If, in the Authority representative's opinion, a satisfactory job has not been done with water, a solution of synthetic detergent and water or non-acidic commercial masonry cleaner, properly diluted, shall be used.

If, in the Authority representative's opinion, a satisfactory job has not been done by either of the two methods specified above, a solution of commercial muriatic acid diluted one part acid to ten parts water may be used with fiber brushes on facing brick. Rinse by flooding with clean water. Cleaning done with acid shall be done before any aluminum is installed in the affected area.

Masonry in need of repointing or recleaning shall be repointed or recleaned in a manner satisfactory to the Authority representative.

7.06 PUMPS AND ACCESSORIES

All pumps, motors, and central equipment shall conform to the requirements set forth in the Approved Drawings and Shop Drawing submittals as to capacity, head and "other requirements". Motors shall be of ample size to operate without overload under all possible conditions of loading through the entire range of the pump characteristic curve. Motors and pumps shall be capable of continuous, 24 hour per day operation.

The discharge of each pump, with the exception of sump pumps, shall be furnished with a pressure gauge. The suction of each pump, with the exception of sump pumps, shall be furnished with a compound gauge. Gauges shall be of the Bourden tube type with cam and roller movement. Discharge gauges shall be graduated in PSIG from zero to twice the head capacity of the pump. Compound gauges shall indicate vacuum in inches of mercury and pressure in PSIG.

VALVES

A. Plug Valves

Straight way plug valves shall be of the non-lubricated, eccentric type with resilient faced plugs. Three way plug valves shall be of the non-lubricated concentric type, resilient seated, lift and turn type operation. Port areas of all valves shall be at least 80% of full pipe area. Bodies shall be of cast iron conforming to ASTM Standard A126, Class B. Valves shall be designed to withstand C.W.P. non-shock working pressures of 175 PSI. Pressure ratings shall conform to ANSI Standard 616.1, Hydrostatic Test. Valves shall have nickel seats, neoprene plug facting, stainless steel bearings, and nitrilebutadiene packing. Means of actuation shall be lever, gear actuator, floor stand, etc. as indicated on the Approved Drawings. All valve sizes 10" and greater shall be furnished with geared actuators. All lever and handwheel actuators shall be furnished with an adjustable, open position memory stop, which allows the valve to be closed and then reopened to the same position. Actuating shafts shall be sealed by means of an adjustable packing gland.

B. Check Valves

All check valves shall be swing check; and shall be produced by Darling Valve Manufacturing Company, Kennedy Valve Manufacturing Company, Chapman Valve Manufacturing Company, R. D. Wood Company, or Mueller Company, or approved equal.

Check valves three inches and larger shall be iron body; fully bronze mounted, and those smaller than three inches shall be solid bronze. The check valves shall be designed for a minimum water working pressure of 150 pounds per square inch and shall be factory tested to double that pressure before shipment. The ends of check valves shall be of the type conforming with the pipe line where installed. Discs shall be open position. Check valve bodies shall provide excess area through the valves to assure full delivery of line capacity. Unless otherwise required, all check valves shall be furnished with outside weighted levers.

7.08 HATCHWAYS

All hatchways shall be aluminum, double leaf, with hold open bar, flush lift handle, gutter drainage collector and drainage coupling, and sized as shown on the Approved Drawings.

7.09 STRAINER BASKET

The Contractor shall furnish and install an aluminum strainer basket on the influent sewer to the pump station as applicable and as indicated on the Approved Drawings. This basket will be mounted on guides, which will allow the raising of the basket for cleaning. Strainer basket shall be a debris screening basket and shall include guides, standoffs, ladder rungs, fine basket, stainless steel lifting cable, and hoist with winch.

7.10 UNIT HEATER

The Contractor shall furnish and install a gas fired or electric unit heater as applicable and as indicated on the Approved Drawings. The unit shall be furnished complete with thermostat and all applicable accessories.

7.11 VENTILATION

Adequate ventilation shall be provided for all pump stations. Where the pump pit is below the ground surface, mechanical ventilation is required, so arranged as to independently ventilate, where applicable, the dry well and the wet well, if screens or mechanical equipment requiring maintenance or inspections are located in the wet well.

Ventilation maybe either intermittent or continuous. Ventilation, if continuous, shall provide at least six complete air changes per hour; intermittent; at least 30 complete air changes per hour. All intermittently operated ventilating equipment shall be interconnected with the respective lighting system.

7.12 DEHUMIDIFIER

A dehumidifier assembly is required to maintain the relative humidity of the air in the pump chamber low enough to keep the electrical equipment dry and to prevent condensation on walls. The moisture removing capability of the dehumidifier shall vary with the temperature and relative humidity within the station. The dehumidifier shall be controlled automatically by an adjustable humidistat and low air temperature cutout with contacts of adequate capacity for the humidifier motor.

7.13 SPARE AND LOOSE PARTS

Parts removed from equipment, and spare and loose parts furnished with equipment shall be suitably labeled and safely stored by the Contractor until the completion of the work, and then delivered to the Authority.

7.14 SPECIAL TOOLS

Furnish one set of all special tools required for operation and maintenance of all equipment furnished. Deliver tools to the Authority's representative.

7.15 ELECTRICAL

Wiring Methods Interior

In all portions of the buildings, installed wire and cable in rigid galvanized steel conduit except electrical metallic tubing may be used above dropped ceilings. All conduits shall be installed exposed except in areas having dropped ceilings where all work shall be concealed. Plastic, PVC conduit may be used for conduit runs in slabs or under the ground floor slab.

All ferrous metals shall be protected by galvanizing or epoxy coating. Sealing fittings are not required, but gaskets shall be used where possible to minimize gas entry into this raceway system.

Use liquid tight flexible steel conduit in lengths not exceeding 18 inches for the connection of motors and other items subject to vibration in all exposed areas and all damp locations.

Flexible steel conduit (Greenfield) may be used in lengths not exceeding 48 inches for the connection of recessed lighting fixtures, and for motors or other items subject to vibration, which are installed above finished ceilings.

Wiring Methods Exterior

Install underground conductors in reinforced concrete encased plastic PVC ducts with a minimum cover of 24 inches. Where not grouped with other conduits, single runs may be rigid galvanized steel, without encasement.

Motor and Equipment Wiring

Provide complete wiring to all motors and equipment shown on the Approved Drawings, leaving same in perfect operating condition. In general, motors less than 1/2 horsepower will be wound for single phase, 120 volts, and motors 1/2 horsepower and over will be wound for 3 phase, 460 volts.

Raceway Material

Size all conduit and raceway in accordance with Table 1, Chapter 9 of the National Electrical Code. The minimum raceway size shall be 3/4 inch, unless specifically noted otherwise on the Approved Drawings.

Plastic conduit shall be made of high impact polyvinyl chloride compound approved for 90 degrees C. Conductors shall conform to NE MA Specification TC2, and Federal

Specification WC1094, and shall bear an Underwriters label. PVC conduit shall be heavy wall Schedule 40.

Rigid steel conduit shall be made of hotdipped galvanized steel manufactured in accordance with U.L. Standard No. 6 or 1242. Rigid steel conduit shall conform to the requirements of Federal Specification WW=C581, latest amendment. Conduit shall bear the manufacturer's and Underwriters labels.

Electrical metallic tubing shall be of steel, galvanized inside and outside, enameled inside and outside, manufactured in accordance with U. L. Standard No. 797 and shall conform to the requirements of Federal Specifications WWC563. Tubing shall bear the manufacturers and Underwriters labels.

Liquid tight flexible steel conduit shall have a plastic jacket that is sealed to the flexible metal jacket. It shall be the type approved for use without a ground wire, where possible.

Flexible steel conduit (Greenfield) shall be made of galvanized steel strip with each convolution interlocked with the previous. Conduit shall conform to the requirements of Federal Specifications WWC566, latest revision.

Raceway Installation

Insofar as possible, install all raceways exposed: Conduits, which are to be concealed, shall be installed in floors. Walls and partitions, and above finished ceilings in such a manner that the structure of the building is not damaged or weakened. Under no circumstances will horizontal runs of conduit be permitted in walls constructed of hollow masonry units. 3/4inch conduit may be embedded in concrete floor slab; any larger conduit shall be installed under the concrete slab. Cover all conduit in cinder or slag fill with cement grout of 2 inch minimum thickness.

Where raceways must be installed exposed, they shall be installed parallel with walls, partitions, joists, beams, and columns so as to present a neat appearance. Exposed diagonal runs will not be permitted.

Branch circuit conduits to motors not located adjacent to wall shall be run under floors and shall be terminated adjacent to the motor locations with outlet boxes placed six inches above finished floor.

Raceways shall be continuous from outlet to outlet, and from outlet to cabinet, junction box or pull box, and shall enter and be secured to all boxes in such a manner that each system shall be electrically continuous from service entrance to all outlets. Where rigid conduits terminate in cabinets, outlet boxes and pull boxes, a bushing and a locknut shall be installed on the inside, and a locknut on the outside. Use conduit adapter bushings where conduits are installed in knockout of larger size.

Mounting Height Of Outlets

Locate outlet boxes in walls with centerline at the following elevations above finished floor.

Wall switch outlets	4'6"
Bracket outlets Exterior	6'4" or 1'0" above doors
Bracket outlets Interior	6'4" or 1'0" above doors
Wall receptacles General	1'6" or above counters

Wall receptacles Utility Area	4'0
Panel Cabinets	6'6" to top
Telephone outlets	1'6"

These heights may be changed which case the Contractor shall Authority's representative to meet building conditions in use dimensions given him by the Authority representative.

Provide all electrical system grounds mentioned herein and/or as required by the National Electrical Code. The following shall be solidly grounded:

1. Neutral leads of secondary service.
2. Main service entrance switch.
3. Panelboards.
4. Motor control center.
5. Transformers, enclosures and neutral leads.
6. Generator frames and neutral leads.
7. Pull boxes.
8. Raceway system.
9. Motor frames,
10. Electric heating equipment,
11. Lighting fixtures. (By raceway)
12. Exterior lighting fixtures. (By driven rods).

All grounding fittings for service and equipment grounds shall be of an approved type.

Panelboards

Distribution and power panelboards shall be of the dead front type, and shall incorporate switching and protective devices of the number, type and rating as noted herein or shown on the drawings. Panelboards shall be rated for the intended voltage and shall be constructed in accordance with the Underwriters Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled. Where panelboards are to be used as service entrance equipment, they shall be so labeled. Panelboards shall also comply with NEMA Standard for Panelboards, National Electrical Code, and Federal Specification WP115a, where applicable.

All exterior mounted panelboards, cabinets, disconnect switches, motor control centers should be stainless steel. Any junction boxes located in the wet well shall be stainless steel.

Interiors shall be completely factory assembled with switching devices, wire connectors, etc. All wire connectors, except screw terminals, shall be of the antiturn solderless type. Interiors shall be so designed that switching and protective devices can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling or tapping.

Circuit breakers shall have quickmake, quickbreak operating mechanisms; shall have silver alloy contacts; shall be electrically and mechanically trip free; and shall have common trip bar for all poles. The operating handle shall indicate ON, TRIPPED and OFF positions. Fault current interrupting ratings shall not be less than the short circuit current rating

indicated on the drawings, nor less than the available short circuit current where the breaker is being installed.

Identify all switching and protective devices by engraved nameplate or by neatly typed directory card with nonflammable, transparent cover mounted on the inside of the doors of the cabinets. Stencil the panelboard designation and system voltage in 1 inch lettering on the inside of each cabinet door.

Coordinate the dimensions of each panelboard and its cabinet with the dimensions of the space designated for its installation. Detail shop drawings of all panelboards, indicating size, rating and arrangement of all switching and protective devices shall be submitted.

Panelboard, Cabinets and Trims

Each panelboard shall be mounted in a sheet steel enclosing cabinet designed for surface or flush mounting as indicated on the drawings. Cabinets shall be fabricated of codegauge, galvanized sheet steel. The rear of the cabinets shall be provided with a minimum of four studs for supporting the panelboard in such a manner that adjustments may be made in all directions.

All cabinets shall have wiring gutters at top, bottom and sides of sufficient size to adequately accommodate both present and future conduits and wires.

Trims shall be fabricated from code gauge sheet steel. Trims for flush type cabinets shall overlap $\frac{3}{4}$ inch or as required, and those for surface type cabinets by means of indicating type trim clamps and shall have an angle iron rest near the bottom to aid in installation and removal. Install all cabinet and trims plumb and in a workmanlike manner.

All trims shall contain hinged doors for covering switching device handles.

Disconnect Switches

Provide safety switch type disconnects where indicated on the Approved Drawings for circuit protection, motor and equipment disconnects, and at all other locations required by the National Electrical Code.

Safety switches shall be of the heavy-duty class, shall be Underwriters Laboratories, Inc. listed and labeled, horsepower rated, conforming to Federal Specification WS865 and NEMA 12 enclosures. Switches indicated to be weatherproof shall have NEMA 4 stainless steel enclosures.

Fuses

Furnish and install current limiting fuses for all fuse gaps. Fuses shall be of nonrenewable cartridge type of the current ratings noted on the Approved Drawings. All fuses shall be Underwriters Laboratories, Inc. listed and labeled.

Motor Control Centers

Motor control centers shall be designed, constructed and tested in accordance with the latest applicable NEMA Standards for Control Centers and Industrial Control. All individual units and all vertical sections shall be Underwriters Laboratories, Inc. listed and labeled, except in the case of nonstandard features where the equipment shall be manufactured to conform in

every way possible to the UL Standard. The design shall have been tested in a recognized high power laboratory to prove that it has both adequate mechanical and electrical capabilities.

Motor control centers shall be of the required number of vertical sections bolted together to form one metal enclosed rigid motor control center. Coordinate the dimensions of the stripping units with the dimensions of the access pathway for moving the motor control centers into the indicated location within the building.

Motor control centers shall be deadfront with NEMA Type IA metal enclosure arranged for freestanding floor mounting.

Motor control centers shall be complete with all bussing and power connections to the individual units, and control wiring to unit mounted pilot devices.

Control center wiring shall be Type B with wiring of unit mounted control devices and unit mounted numbered pull apart terminal blocks for all control wiring. Unit mounted terminal blocks shall be provided for power wiring of starters.

Additional terminal shall be included for junction points for wiring from remote devices, arranged with no more than 2 field wires per terminal.

Submit shop drawings for the motor centers, consisting of the following minimum drawing requirements:

- 1) Outline drawing and floor plan.
- 2) Schedules of all units, accessories and nameplates.
- 3) Connection diagram for each individual unit with terminal numbering.
- 4) Notes and specifications.

Across the line elementary diagram for each individual unit with the terminal numbering. Diagrams shall be complete including devices external to the motor control center.

Control Panels

Furnish and install control panels for various motors and equipment with relays, time clocks, time delay relays, pilot lights, pushbuttons, and selector switches as detailed on the Approved Drawings. The control panels shall be totally enclosed, factory assembled and wired panels.

The control panel components shall be mounted in NEMA 12 or NEMA 4 continuous hinge enclosures, as indicated, which shall be wall mounted. The indicating lights shall be shelf contained transformer type, press to test lights. The indication lights and selector switches shall be heavy-duty, oiltight control units. Furnish weatherproof boots, where required, for devices in NEMA 4 panels. Relays shall be of the machine tool type with convertible contacts. Relays shall have a minimum of one spare set of contacts.

Lighting Fixtures

Furnish and install all lighting fixtures complete with lamps, ballasts, fuses and other accessories for each and every outlet indicated, on the Approved drawings. Plaster rings or frames shall be provided for all recessed fixtures in plaster and other non-accessible ceilings.

All lighting equipment shall be designed, adjusted and focused to perform as desired and to illuminate the objects or areas intended.

The parts of lighting units exposed to the weather shall be made of non-corroding metals, such as aluminum, stainless steel or, bronze, and all fastenings and fastening devices shall be made of the above listed metals.

All fixtures shall be approved by shop drawings, sample or catalog identification. All lighting fixture shop drawings shall be submitted at the same time in sets or brochures. Exterior pole mounted lighting fixtures, shall be protected with GMF fuses, or rating recommended by ballast manufacturer. Fuses shall be contained in HLR fuseholders.

Exterior Lighting and Control

Provide all the various types of exterior lighting for roadways, parking lots, walkways, as indicated on the Approved Drawings.

Stake out the locations of all exterior lighting fixtures and obtain Authority representative's approval for all such locations before starting any related excavation, trenching or concrete work.

Standby Power and Lighting System

Furnish and completely install a standby power and lighting system in conformance with the requirements of the Department of Labor and Industry, Commonwealth of Pennsylvania and Article 701 of the National Electrical Code.

The standby power and lighting system shall consist of a natural gas engine driven standby generator, concrete foundation, automatic transfer switch, standby panels, power and control wiring, conduit, wire, outlets, lighting fixtures, and other accessories required for a complete and operable system.

The automatic engine generator set shall be of such design that it shall satisfactorily operate and successfully carry its rated output as shown on the drawings without exceeding its safe operating temperature, for the duration of any utility electrical outage. The automatic transfer switch shall have phase protection and under voltage protection. The engine generator shall have a timer controlled block heater.

The standby power and lighting system shall be interconnected with the normal utility electrical supply by means of an automatic transfer switch which shall operate in such a manner that when the normal utility electrical supply fails, its under voltage sensing shall provide, after a time delay, a contact closure to signal the engine generator to start; and when the generator output reaches both 90% of voltage and frequency, the emergency load shall be transferred to the generator output and shall be supplied by the engine generator for the duration of the Utility outage. When the normal Utility supply is re-established after a time delay, the emergency load shall be transferred back to the Utility supply and the engine generator shall be signaled to cool down and stop.

The engine generator set shall be the product of the original equipment manufacturer of either or both the engine and/or the generator. The set shall be engineered and designed as a complete unit and the manufacturer shall have full responsibility for the satisfactory

coordinated operation of all components. The manufacturer or his distributor shall maintain a parts, stock and service facilities within a radius of 75 miles of the project site.

When applicable and where indicated on the drawings, the generator and accessories shall be housed in an outdoor type enclosure providing complete protection from the elements in a cold climate region. The housing module shall be factory assembled and tested with the generator and all components. Only fuel inlet, power feeders, control wiring, the corrosion protection connections shall remain to be completed in the field.

On completion of the installation, a factory trained representative of the engine generator manufacturer shall provide instruction on operating and maintenance procedures to the Owner's personnel. Two copies of operating and maintenance instruction books, and parts list shall be supplied for the engine generator set and such auxiliary equipment as may require same.

Detail shop drawings of the engine generator, control panels, fuel storage, transfer and piping system, exhaust silencer, batteries, battery charger, automatic transfer switch, timer controlled block heater and other accessories along with certification of Department of Labor and Industry approval shall be submitted to the Authority. A certified installation drawing for the engine generator base shall be included.

The engine generator set shall receive the manufacturer's standard factory testing. Prior to acceptance of the installation, the equipment shall be field tested to show it will start automatically, subjected to a 4-hour full load test; shut down and reset. The Contractor shall provide and connect temporary load bank as required to satisfy the full load test requirement. Prior to acceptance, any defects, which become evident during this test shall be corrected by the Contractor at his expense.

Alarm System

The Contractor shall furnish and install a system to monitor and transmit alarms to the Meadowbrook Road Treatment Plant and the Murrysville Police Station. The system shall utilize UHF radio transmission or current method in use by the Authority at the time of construction, and shall be fully compatible with the system in use. The pump station shall be equipped with a transceiver to accept a minimum of four contact closure alarm inputs, and 420 MA DC signal inputs where applicable. The units shall continuously monitor their inputs, transmitting only on a change of condition. Each station shall be equipped with a directional antenna, A.C. line surge protectors, connectors, lightning arrestors and any other items required for a complete and operable system. Any necessary additions to alarm receiving display and control units at the plant and police station will be provided by the Contractor. Supplier services shall include construction supervision, startup, FCC licensing, instruction of Authority personnel and manuals.

7.16 ODOR CONTROL

For odor control at pump stations and force mains, the Developer may provide a sodium hypochlorite feed system or alternate approach as approved by the Authority. Alternate approaches are encouraged due to the decomposition of sodium hypochlorite solution under normal storage conditions. The feed capacity of the metering pumps will depend on the size of the

development and the length of the force main. The predicted sulfide concentration at the end of the force main shall be calculated by the following equation:

$$S = (M) (t) [EBOD (4 + 1.57)] d$$

where

S = predicted sulfide concentration, mg/l

M = sulfide flux coefficient, for filled pipe, experimentally determined empirical constant, m/hr. 1.0×10^3

t = detention time in a given force main in hours

EBOD = effective BOD, mg/l, use 280 mg/l (this assumes a temperature of 25°C)

d = pipe diameter, m

For design of odor control facilities, use an EDU flow rate of 200 gpd.

Feed System

The design and sizing of odor control facilities shall be by the Developer's engineer and shall be approved by the Authority, in accordance with this Regulation. Piping material, valve selection, seal materials, pressure relief, and stagnation control are design, safety, and operational measures to consider when designing systems.

For sodium hypochlorite (NaOCl) feed systems, NaOCl solution at 12.5% (w/w) concentration may be utilized for odor control. The chemical should be fed into the wet well. In practice, NaOCl:H₂S weight ratios required for effective odor control vary, with 6 NaOCl (100%):1 H₂S being common.

Hypochlorite Safety Equipment

Any safety equipment necessary to handle hypochlorite spills shall be located on the feed system premises. This equipment shall be in an enclosure to protect it from the elements.

SECTION VIII – FENCING

Fencing shall be furnished and installed complete as indicated on the Approved Drawings and/or specified herein.

8.02 General

Fencing shall be of the chain link type with top rail, and single extension arms carrying three strands of barbed wire. The fabric height shall be six feet and the overall height of the fence including the barbed wire extensions shall be seven feet. Gates shall be of the size and number of sections indicated on the Approved Drawings, and shall be adequately braced. Both fence and gates shall be the product of an established reputable manufacturer of such items.

8.03 Materials

The materials constituting the fencing shall conform to the following:

A. Fabric

Aluminum coated steel chain link wire 72 inches high No. 9 galvanized woven in two-inch mesh, top and bottom linkage to have a barbed finish. The wire pickets shall have a minimum tensile strength of 30,000 PSI. Fabric shall have a minimum coating of 0.40 oz. per square feet of wire surface per ASTM specification A49. Fabric shall be connected to line posts with six gauge wire clips every 14 inches; to top rail with nine gauge ties every 24 inches; to terminal, corner and gate posts by integrally weaving into the post.

B. Barb Wire

Aluminum coated steel barb wire to be of four point pattern, composed of two 12 1/2 gauge strand line wires a minimum aluminum coating weight of 0.30 ounces per square foot of wire surface and 14 gauge aluminum barbs on approximately five inch centers.

C. Bottom Tension Wire

No. 7 galvanized aluminum coated spring coil tension wire, fastened to chain link fabric with 11 gauge hog rings on 24-inch centers.

Gate shall have positive type latching devices with provisions for padlocking; and drive gates shall have a center plunger rod, catch and semiautomatic outer catches.

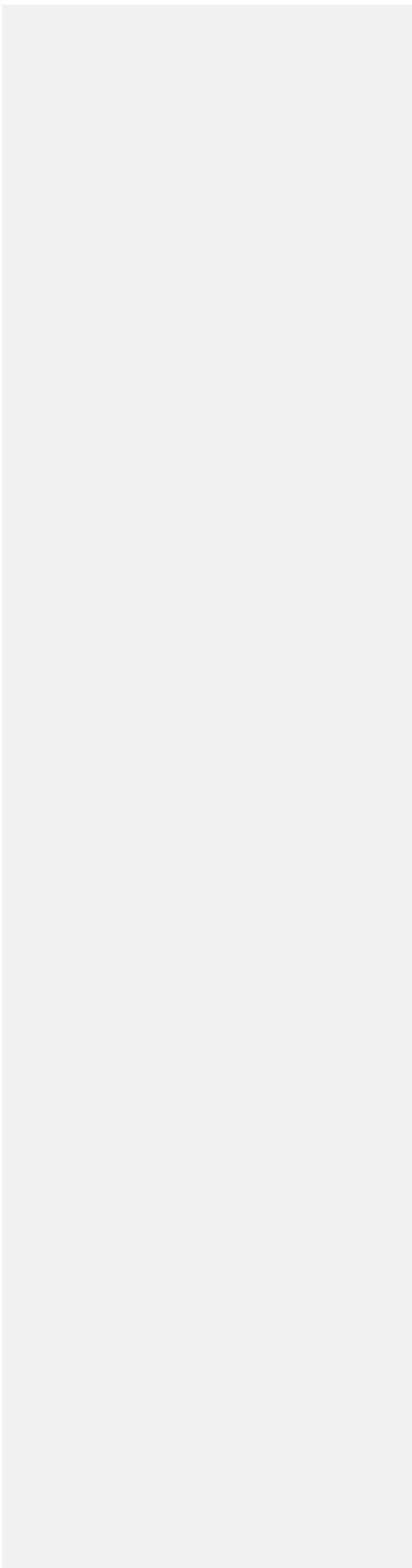
All posts, rails and appurtenances shall be hot dipped zinc coated steel per ASTM specifications A120, A123 or A153 whichever is applicable. Pipe posts shall have tops, which exclude moisture. Standard mill tolerances on all framework and chain link fabric will apply.

8.04 Erection

All fencing shall be erected by workmen experienced in this particular type of work and shall be installed true to line, tight, and without sags. Expansion sleeves shall be installed in a manner to provide a rigid connection and to allow for expansion.

Line posts shall be spaced at not more than 10 feet on centers. All posts shall extend three feet into footings of Class B concrete. These footings shall extend four inches below the

post and shall have a minimum dimension in cross section of 12 inches for terminal posts and 10 inches for line posts. The tops of the footings shall be crowned to shed water.



SECTION IX - PAINTING

9.01 MATERIALS

1. Paint coatings shall be suitable for the intended use. Materials shall be recommended by their manufacturer for the intended service.

Paint coatings used on ferrous surfaces for submerged or exterior service shall be of protective paint coating quality.

2. In any one paint coating system, all coatings shall be compatible. Only products of one manufacturer shall be used. Coatings used for touch up shall be the same as the originally applied coatings.

9.02 SHOP COATINGS

1. All ferrous metal surfaces subject to normal exposure, immersion, moisture, condensation or chemicals shall receive a shop applied prime coating after the surfaces have been properly prepared.
2. Shop coats shall be compatible with coatings to be applied in the field at the site.

9.03 COLORS

1. The Developer shall submit suitable color samples to the Authority for approval prior to proceeding with the work. No variations shall be made without the Authority's approval. Color names and/or numbers shall be according to the appropriate color charts issued for the particular product in question. Standard colors, as selected by the Authority, shall be factory tinted unless otherwise specified.

9.04 SURFACE PREPARATION

1. Ferrous metal surfaces subject to continuous or intermittent immersion or corrosive atmospheres identified, as non-submerged metal shall be sandblasted to a Near-White grade in accordance with the Steel Structure Painting Council Specification SSPC-SP-10. All blasted surfaces shall be coated the same day as blasted.
2. All other ferrous metal surfaces subject to normal industrial exposure shall be sandblasted to a Commercial grade in accordance with Sections SSPC-SP-6. All blasted surfaces shall be coated the same day as blasted.
3. Other methods for cleaning steel surfaces shall conform to SSPCSPI Solvent Cleaning, SSPC-SP2 Hand Tool Cleaning, and SSPCSP3 Power Tool Cleaning as appropriate for the exposure and specified coating.
4. All concrete surfaces shall be cleaned of all dust, dirt, form oil, curing compounds and other foreign matter. Concrete floors shall be etched with a

15-20% solution of muriatic acid. Etched floors shall have the granular appearance of fine sandpaper and shall be re-etched to attain uniformity if required. After etching, all acid shall be flushed off with clean water to be furnished by the Developer.

5. All wood surfaces shall be clean and free of all foreign matter, with cracks and nail holes and other defects properly filled and smoothed. Wood trim shall be sandpapered to a smooth finish and wiped clean of dust.
6. All aluminum surfaces shall be cleaned free of all dirt, oils, grease and other foreign matter. Surfaces shall be immersed in or treated with chemical compounds designated for this purpose. Surfaces shall be thoroughly rinsed with clean water and completely drained.
7. Galvanized metal surfaces shall be treated prior to painting with chemical compounds designated for this purpose in accordance to paint manufacturer's directions.
8. Insulation on pipes and ducts shall be cleaned of dirt, dust and other foreign matter and shall receive one coat of Latex Primer to prepare for finish painting.
9. PVC shall be scuff sanded and washed with isopropyl alcohol prior to painting.

9.05 PAINTING SCHEDULE

1. Submerged Ferrous Metal - All submerged ferrous metal surfaces, piping and mechanical equipment, which shall be in contact with, sludges, sewage or other liquids (not including potable water).
 - a. Shop Surface Preparation: Near White Sandblast (SSPC SP10)
 - b. Shop Primer: 1 Coat Universal Metal Primer
 - c. Preparation: Spot sand blast rust, bare metal, and deficient shop primer to SP-10 (Near White Sandblast). Do not touch up shop primer.
 - d. Finish: 2 coats Coal Tar-Epoxy Coating (6.0 - 8.0 mils DFT each coat).
2. Non-submerged Ferrous Metal - All non-submerged ferrous metal surfaces that shall be subject to moisture, condensation and chemicals.
 - a. Preparation: Hand and power tool clean (SP-2 & SP-3) as needed to remove rust, loose shop primer, and other surface contaminants.
 - b. Prime: 1 coat Universal Primer (2.0 - 3.0 mils DFT)
 - c. Finish: 2 coats Catalyzed Epoxy Coating (4.0 - 6.0 mils DFT per coat).

3. Submerged Equipment (Pumps, aerators and other process Equipment):
 - a. Factory finish by manufacturer with material suitable for submersion in raw sewage and sludge.
 - b. Touch-up: Shop paints provided by the equipment manufacturer.
4. Equipment:
 - a. Factory finish by manufacturer with standard coating material.
 - b. Touch-up: Shop paints provided by the equipment manufacturer.
5. Interior Ferrous Metal - All interior ferrous metal surfaces including hollow metals.
 - a. Surface Preparation: spot hand tool clean (SSPC-SP2)
 - b. Prime: 1 coat Rust Inhibitive Primer (1.5 – 2.0 mils DFT)
 - c. Finish: 2 coats Alkalyd Enamel (2.0 – 3.0 mils DFT each coat)
6. Exterior Ferrous Metal - All exterior ferrous metal surfaces including hollow metals.
 - a. Surface Preparation: spot hand tool clean (SSPC-SP2)
 - b. Prime: 1 coat Rust Inhibitive Primer (1.5 – 2.0 mils DFT).
 - c. Finish: 2 coats Silicone-Alkyd Enamel (1.0 – 2.
7. Ferrous Metal - All ferrous metal surface encased in concrete.
Primer: 1 coat rust metal surface encased in concrete.
8. Submerged Concrete - The inside surfaces of tanks:
 - a. Preparation: Brush-off sandblast to remove laitance and other surface impurities.
 - b. Finish: 2 coats Coal Tar Epoxy Coating (6.0 - 8.0 mils DFT each coat).

Coal tar epoxy coatings shall be top-coated within 24 hours. If 24 hours are exceeded prior to application of the next coat, then the previous coat shall be roughened by brush blasting before applying the next coat.
9. Exterior Concrete and Masonry - Below grade - including backfill areas of building, and as noted on the Plans.
 - a. Preparation: Brush-off sandblast to remove laitance and other surface impurities.
 - b. Finish: 1 coat Coal Tar Epoxy Coating, applied at a spreading rate of 120 square feet per gallon.
10. Drywall Walls and Ceilings
 - a. Primer: 1 coat Latex Emulsion Primer (1.0 – 2.0 mils DFT)
 - b. Finish: 2 coats Latex Semi-gloss Acrylic Emulsion (2.0-2.5 mils DFT each coat).

11. Interior Concrete and Masonry - As noted on the Plans.
 - a. Primer: 1 coat Masonry Block Filler or Latex Emulsion Primer as required.
 - b. Finish: 2 coats catalyzed epoxy enamel, applied at a spreading rate of 250 square feet per gallon
12. Exposed Galvanized Conduit and Supports: (Interior)
 - a. Primer: 1 coat Galvanized Steel Primer unless scheduled finish paint is self-priming on galvanized surfaces.
 - b. Finish: Same material and color as adjacent surfaces.
13. Concrete Floors - As noted on the Plans.
 - a. Primer: 1 coat Catalyzed Epoxy Coating, thinned 50% with appropriate thinner applied to 2 mils dry film thickness.
 - b. Intermediate: Catalyzed Epoxy Coating, applied at a spreading rate of 300 square feet per gallon to obtain 4 mils dry film thickness.
 - c. Finish: Same as intermediate applied to 2 mils dry film thickness.
14. Galvanized, Aluminum, Non-ferrous Metals - where designated for coating shall receive one coat of Galvanized Steel Primer as a pretreatment before applying appropriate coating systems.
15. Interior & Exterior Wood - All, unless otherwise noted on the Plans.
 - a. Primer: 1 Interior & Exterior Wood - All, unless otherwise noted on the Plans.
 - b. Finish: 2 coats of Alkyd Enamel at 1.5 to 3.0 mils dry per coat.
16. Aluminum surfaces, which after erection, are to be embedded or otherwise in contact with concrete, brick masonry or mortar shall be painted with heavy asphaltic or bitumastic paint.
17. All exposed plastic pipe shall receive two (2) coats of Alkyd Enamel.
18. All asphalt-coated pipe shall receive one coat of Anti-Bleeding Sealer prior to painting with Alkyd Enamel.
19. Shop Primers
 - a. All metal surfaces subject to immersion or severe exposure such as, moisture, condensation or chemicals, shall be shop primed with universal metal primer specified in this Section.
 - b. All metal surfaces not subject to immersion or severe exposure, but normal exposure, shall be shop-primed with rust inhibitive primer as specified in this Section.

9.06 ACCEPTABLE MANUFACTURERS:

- | | |
|------------|----------------------|
| 1. Valspar | 4. Sherwin Williams |
| 2. Koppers | 5. PPG Industries |
| 3. Tnemec | 6. Or approved equal |

9.07 EXECUTION

1. The Developer shall, when work is located in confined spaces, provide and maintain safe working conditions for all employees. Fresh air ventilation shall be provided to continuously remove paint fumes from the confined space through the combined use of existing openings, force-draft fans and temporary ducts to the outside. Paint fumes shall, if possible, be exhausted to the outside from the lowest level in the confined space. Electrical fan motors shall, if located in the confined space, be explosion-proof. No smoking or open fires will be permitted in the confined space.
2. Where thinning is necessary, only the product of the manufacturer furnishing the paint and for the particular purpose shall be allowed and all such thinning shall be done strictly in accordance with the manufacturer's instructions.
3. Adequately protect adjacent surfaces from paint and damage. Repair damage as a result of inadequate protection.
4. Furnish drop cloths, shields and protective covers to prevent overspray and paint droppings from fouling adjacent surfaces.
5. Place waste cloths and material, which may constitute a fire hazard in closed metal containers and remove from the site daily.
6. All work shall be performed by skilled personnel regularly engaged in this type of work. Surfaces shall be left free from drops, ridges, waves, laps and brush marks. Edges of paint adjoining other colors or materials shall be sharp, true and free of overlapping.
7. Do not apply paint in temperatures below 50 degrees Fahrenheit except where manufacturer allows lower temperatures or above 90 degrees Fahrenheit, nor at any time when temperatures cannot be controlled and are likely to be outside the limits recommended by the paint manufacturer. No painting shall take place when the surface temperature is below the dew point or when relative humidity is above 85 %. No exterior painting shall be done during threatening weather or under other conditions, which are unsuitable for obtaining good results.
8. Do not apply prime or seal coats of paint to wood in areas where cement, mortar or plaster is in the process of application or drying.
9. Each coat shall be uniform in coverage and color. Number of coats shall be as specified or required for the acceptance of the finish. Each coat shall be carefully examined and poor workmanship, holidays, damaged areas and other imperfections shall be touched up prior to applying succeeding coats. Comply with paint manufacturer's recommendations for drying time between coats.

10. Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing any condition that may potentially affect proper application. Do not commence until such defects have been corrected.

9.08 LINE MARKING

All process, heating, plumbing and other lines will be marked with a painted arrow showing the direction of flow at each valve, at every point entry or exit at walls, on each riser and "T" joint. These arrows will be placed on the lower two quarters section of pipe. Pipemarkers will be acceptable in lieu of painted arrows: Each line shall also be clearly labelled as to the contents of flow as directed by the Authority representative.

9.09 CLEANUP

The Developer shall be responsible for the cleanliness of his operations, using covers and masking tape to protect the work wherever such covering is necessary, or is so requested by the Authority. Any paint spoiling unpainted surfaces or surfaces painted a different color shall be carefully removed without damage to any finished paint. If damage does occur, the entire surface adjacent to and including the damaged area shall be repainted without visible lap marks and without additional cost to the Authority.

The Developer shall be entirely responsible for injury or damages to the property of the Authority, other contractors and subcontractors, or the general public, if such injury or damage is due to the Developer's own negligence, carelessness, poor workmanship, or poor judgment regarding painting methods or suitability of conditions for the application of paint.

**SECTION X - ADDITIONAL SPECIFIC SEWER
CONSTRUCTION REQUIREMENTS**

1. All materials and construction methods must be approved by the Authority at a preconstruction meeting prior to starting any phase of construction. Shop drawings for manholes, castings and pipe must be submitted for approval prior to the preconstruction meeting.
2. A legible copy of all delivery slips shall be given to the Authority representative immediately upon delivery of any material to the construction site.
3. All stake out work shall be done by a registered surveyor or engineer. Two copies of all cut sheets are to be provided to the Authority representative.
4. No pipe is to be covered prior to approval by the Authority representative.
5. As Built drawings must reference all manholes, wyes, inspection stakes and ends of 6" laterals by distance to downstream manhole, invert elevation, distance from sewer main and the angles between manholes. As-Built profiles must indicate elevations at which work is encountered.

SECTION XI - PRESSURE SEWER SYSTEM

11.01 Scope

The pressure sewer system shall be considered as a supplemental tool for the wastewater collection system and not as a replacement for the conventional gravity collection system. It is expected that a pressure sewer system would generally be used in small subsystems or areas. This system may be approved for use under conditions such as the following:

- a. Where the topography makes it difficult for the potential users to be served by a gravity collection system.
- b. Where groundwater conditions make it difficult to construct and maintain a gravity collection system.
- c. Where excessive rock excavation makes the gravity collection system impractical.

11.02 Design Criteria

The following considerations shall be used for the design of a pressure sewer system including the grinder pump units, or centrifugal pump units where solids don't present a problem.

- a. Collection System
 1. No pressure sewer less than 1 1/4 inches inside diameter shall be provided. The required size shall be determined to maintain low frictional losses in the system and a minimum scouring velocity of 2 feet per second at all points in the system.
 2. Special care shall be, exercised in the hydraulic design of a pressure sewer system which is proposed to serve ultimately more houses than those expected to be served initially.
 3. The determination of flow in the pressure sewer system shall be made on the basis of the maximum probable number of grinder or centrifugal pump units that would be expected to run simultaneously or some other accepted method of computing the peak sewage flow rate in the system.
 4. The pressure sewer system shall be laid out in a branched or tree configuration to, avoid flow splitting at branches, which cannot be accurately predicted.
 5. The pressure sewer piping shall be installed in a depth sufficient to protect against freezing and damage from vehicular traffic.
 6. Although any suitable pipe material can be used plastic pipe such as PVC S.D.R.26 or equivalent are considered suitable. A value of C130 to 150 is recommended to be used for plastic pipe in the Hazen Williams formula.
 7. Cleanout connections shall be provided at distances not to exceed capacity of available cleaning equipment (approximately 500-600 feet). Flushing cleanouts should be provided at the upstream end of every major branch.
 8. Pressure and vacuum release valves shall be employed at appropriate locations. Pressure sewers should be constructed on a gradually ascending slope to minimize air binding.

9. The pressure sewer main shall be color taped or coded to distinguish between sanitary sewer and water main, and the direction of flow should be indicated on all pressure sewers inside the building.
10. Current standards shall be maintained in separating parallel sanitary and water systems.
11. Pressure sewer systems operating pressures in general shall not exceed a range of 40, to 60 psi for any appreciable period of time.
12. Thorough pressure testing of all lines, fittings etc. shall be made prior to startup.
13. Details of construction shall be clearly stated in the drawings and/or specifications.

b. Grinder Pump Units

1. The minimum net storage capacity of the grinder pump unit shall be approximately 50 gallons. The grinder pump tank should be able to accommodate normal peak flows and emergency storage during a short power failure.
2. If grinder pump units are replacing an existing onlot system, the existing system should be retained for holding sewage during an extensive power failure. An emergency overflow should be provided from the grinder pump tank to the emergency holding tank.
3. The grinder pump shall have the characteristics which will continue to produce flows of at least 8 gpm even when conditions in the pressure system cause heads to rise temporarily to values higher than the normal maximum.
4. Check and shutoff valves shall be employed to isolate the grinder pump unit from the house service line and the pressure laterals and be located within the property lines.
5. Appropriate high water and overflow detection devices such as visual and/or audio alarm shall be provided.
 - a. Provisions shall be made to insure that the grinder pump operates even under temporary, loads above normal and contains integral protection against back siphonage and over pressure.
6. The grinder pump unit shall, be capable of reducing any material in the wastewater which, enters the grinder unit to such size that the material will pass through the pump unit and pressure sewer without plugging or clogging. No screens or other devices requiring regular maintenance shall be used to prevent trashy material from the grinder pump.
7. If the grinder pump unit is installed outside the residence, provision must be made for access, as well as protection from weather and vandalism. Inside installations shall be quiet and free from electrical and/or health hazards and (shall) preferably be certified by nationally recognized independent testing laboratories, such as the Underwriter's Laboratories, Inc. and the National Sanitation Foundation.
8. The grinder pump unit must be capable of being removed without dewatering the collection tank.
9. Grinder pumps shall be equipped with a 6 inch diameter inlet for connection of a 6 inch lateral as required by FTMSA.
10. As per the FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY ADMINISTRATION MANUAL SECTION III, BOARD

POLICY DECISIONS, PART C: Item 10. Construction Costs - Sewer Systems by Developers

C. Community Treatment/Disposal Systems

Community treatment/disposal systems shall not be permitted within the FTMSA service area.

D. Septic Tank Effluent Pump (STEP) Systems

Septic tank effluent pump (STEP) systems shall not be permitted within the FTMSA sewer system.

E. Low Pressure Grinder Pump Systems

As an alternative to a conventional gravity sewer system, the use of a low pressure grinder pump system shall not be permitted within the FTMSA sewer system unless approved by the Authority's Manager and Consulting Engineer. The selection of this conveyance system will be based on both monetary and non-monetary (e.g., environmental, social, institutional) considerations. It is expected that this system would generally be used in small sub-divisions or areas. This system upon approval may be used under conditions such as the following:

- a. Where the topography makes it not feasible for the potential users to be served by a gravity collection system.
- b. Where groundwater conditions make it not feasible to construct and maintain a gravity collection system.
- c. A detailed explanation as to why gravity service is not feasible, and why a low pressure grinder pump system is appropriate.

If the Authority approves a low pressure grinder pump system per the above, the next step will be to submit to the Authority sufficient information to permit a thorough evaluation of the proposed system. This information shall include, but not be limited to, the following:

1. Technical specifications of the proposed low pressure grinder pump system designed per the Authority's "Manual of Procedures and Requirements for Constructing Sanitary Sewers".
2. Enter into a Standard Developers' Construction Agreement.
3. Submittal of shop drawings prior to actual construction. These shop drawings must be approved by the Authority.

F. Individual Grinder Pumps

Where gravity sewer systems are deemed feasible by the Authority Manager, individual grinder pumps shall not be approved. However, where deemed appropriate by the Authority Manager, and where gravity sewer service is not feasible, individual grinder pumps may be installed by a homeowner or Developer upon the Authority Manager's approval.

When an individual grinder pump installation is proposed by a Developer or homeowner, sufficient information must be provided to the Authority to permit a thorough evaluation of the proposed system. This information shall include, but not be limited to, the following:

- a. A detailed explanation as to why gravity service is not feasible, and why an individual grinder pump system is appropriate.
- b. Technical specifications of the proposed individual grinder pump unit.
- c. Shop drawings prior to installation of the units. These shop drawings must be approved by the Authority.

The individual grinder pump system shall be manufactured by Environment One Corp., or Authority-approved equal. The normal grinder pump unit shall be Environment One Corp. Model GP-2010 or any update or modification model thereto, or Authority approved equal. The Developer's (or homeowner's) engineer shall review the hydraulic requirements of the application and conform that the use of the normally specified pump is acceptable, or shall specify an alternate pump model that would be acceptable to the Authority.

Installation of the individual grinder pump units shall be in accordance with the FTMSA Rules and Regulations. All individual grinder pump system installations must be inspected, tested, and deemed to be in compliance with the Authority's Rules and Regulations by the Authority or its authorized agents prior to backfilling.

Ownership and Maintenance of individual grinder pump systems: All individual grinder pump units shall be and remain the property of the homeowner, regardless of who provides the originally installed equipment. Maintenance of the individual grinder pump units, piping, and all appurtenances and controls located outside the road right of way line shall be the sole responsibility of the homeowner.

Should a maintenance problem occur with an individual grinder pump unit, the homeowner must make, or have a plumber make, the necessary repairs. If during the course of making the repairs the owner or plumber finds that a new pump is needed, then a plumber must replace the pump, at the owner's cost, as specified above.

All electrical control panels of individual grinder pump units installed within the FTMSA service area shall have a permanently attached phenolic label indicating that "*All maintenance costs for individual grinder pump systems are the homeowner's responsibility*".

The following notation shall be included on all development plans proposing the use of individual grinder pump systems in the FTMSA service area: "*A copy of the Individual Grinder Pump Management Plan shall be given to the homeowner of any affected property, at the time of settlement of that property*".

Connections of pressurized Service Lines shall be made into a gravity Sewer Lateral within the road right of way.

Design Criteria -the following considerations shall be used for the design of a pressure sewer system, including the grinder pump units where solids do not present a problem.

a. Collection System

- (1) No pressure sewer less than 1 1/4 inches inside diameter shall be provided. The required size shall be determined to maintain low frictional losses in the system and a minimum scouring velocity of two feet per second at all points in the system.
- (2) Special care shall be exercised in the hydraulic design of a pressure sewer system which is proposed to serve ultimately more houses than those expected to be served initially.
- (3) The determination of flow in the pressure sewer system shall be made on the basis of the maximum probable number of grinder pump units that would be expected to run simultaneously or some other accepted method of computing the peak sewage flow rate in the system.
- (4) The pressure sewer system shall be laid out in a branched or tree configuration to avoid flow-splitting at branches which cannot be accurately predicted.
- (5) The pressure sewer piping shall be installed in a depth sufficient to protect against freezing and damage from vehicular traffic.
- (6) Although any suitable pipe material can be used, plastic pipe such as PVC SDR-26 or equivalent are considered suitable. A value of C-130 to 150 is recommended to be used for plastic pipes in the Hazen-Williams formula.
- (7) Clean-out connections shall be provided at distances not to exceed capacity of available cleaning equipment (approximately 400 feet) Appropriate valves for bypass pumping of the wastewater between cleanouts, necessary during the repair of the pressure sewer piping, shall be provided. Flushing cleanouts should be provided at the upstream end of every major branch.
- (8) Pressure and vacuum release valves shall be employed at appropriate locations. Pressure sewers should be constructed on a gradually ascending Slope to minimize air binding.
- (9) The pressure sewer main shall be color taped or coded to distinguish between sanitary sewer and water main, and the direction of flow should be indicated on all pressure sewers inside the buildings.
- (10) Pressure sewer system operating pressures in general shall not exceed a range of 40 to 60 psi for any appreciable period or time.
- (11) Thorough pressure testing of all lines, fittings, etc. shall be made prior to start-up.

(12) Details of construction shall be clearly stated in the drawings and/or specifications.

b. Grinder Pump Units

(1) The minimum net storage capacity of the grinder pump unit shall be approximately 50 gallons. The grinder pump tank should be able to accommodate normal peak flows and emergency storage during a short power failure.

(2) The grinder pump shall have the characteristics which will continue to produce flows of at least eight gpm under all conditions.

(3) Check and shut-off valves shall be employed to isolate the grinder pump unit from the house service line and the pressure lateral.

(4) Appropriate high water and overflow detection devices such as visual and/or audio alarm shall be provided. The grinder pump control panel shall contain a separate control circuit and breaker for the alarms.

(5) Provisions shall be made to insure that the grinder pump operates under power load fluctuations and contains integral protection against back siphonage and over pressure

(6) The grinder pump unit shall be capable of reducing material in the wastewater which enters the grinder unit to such size that pass through the pump unit and pressure sewer without plugging or clogging. No screens or other devices requiring regular maintenance shall be used to prevent trashy material from entering the grinder pump.

(7) If the grinder pump unit is installed outside the residence, provision must be made for access, as well as protection, from weather and vandalism. Inside installations shall be quiet and free from electrical and or health hazards. All installations shall be certified by nationally recognized independent testing laboratories such as the Underwriter's Laboratories, Inc. and the National Sanitation Foundation.

(8) The grinder pump unit must be capable of being removed without dewatering the collection tank.

11.03 Operation, Maintenance and Service

Grinder pump units must be serviceable and replaceable under wet conditions without electric hazard to the repair personnel. Piping and pump units shall be designed for rerouting of flow under emergency conditions.

- a. Provisions shall also be made to avoid interruption of sewer service due to mechanical or power failure. Alternatives shall include:
 - 1. Piping interconnection with a second, nearby grinder pump installation.
 - 2. Provision of standby power generator.

3. Connection to a holding tank or to an existing septic tank system.
 - b. The pressure sewer system shall be owned, maintained and operated by the Franklin Township Municipal Sanitary Authority. The grinder or centrifugal pump units, check valves, valve pits, etc. shall be located inside the property lines and owned and operated by a private individual.

XII OIL, SAND & GREASE INTERCEPTORS

All persons discharging sanitary sewage containing grease, oils or fats into the Sewer System shall provide adequate grease and sand traps or oil separators which shall effectively keep the grease content of sewage leaving the premises to less than 100 parts per million by weight. Such traps or oil separators must be pumped out and cleaned at least once per year.

All grease traps, sand traps, or other devices for pretreatment of sanitary sewage or industrial wastes shall be subject to the approval of the Authority prior to installation.

Establishments which discharge grease or oil, such as restaurants, must have two or more grease and oil traps installed in series. The grease and oil traps must be approved before installation by the Authority Manager.

GREASE INTERCEPTOR/GREASE TRAP & SAND/OIL INTERCEPTOR REGULATIONS

12.01 General

a. Grease & Sand/Oil Interceptors shall be provided when, in the judgment of the Authority, they are necessary for the proper handling of liquid wastes containing grease or solids, sand, grit and/or petroleum-based liquid waste which may be harmful to, or cause obstruction of the publicly owned wastewater collection system, interfere with the operation of the publicly owned treatment works. On a general basis, Grease & Sand/Oil Interceptors will be required for all Affected Property as described:

1. non-residential properties on which occurs preparation and/or sale of food to the general public, including but not limited to restaurants, cafes, fast food outlets, pizza outlets, delicatessens, sandwich shops, and any and all other kinds and types of food vending establishments in which any food preparation (including heating or defrosting in or by means of any kind of oven or heating device) takes place on the premises, whether or not such facilities are located in a separate building or structure that is occupied by other businesses;
2. schools, churches, boarding houses with communal kitchen facilities;
3. nursing homes, and day care centers which have kitchens and engage in the food preparation of food,; and
4. non-residential properties on which occurs vehicle parking or storage, automotive service or repair, machine shops, and/or mechanics providing service to the general public, including but not limited to service stations, truck stops, gasoline stations, automotive/car care centers, auto body shops, automotive dealerships, car washes, motorcycle shops, machine shops, welding -shops, tractor/farm implement dealerships, truck/bus dealerships, bus barns, or any other facility that generates sand, grit and/or petroleum by-product waste that would discharge into the wastewater collection system.

b. An adequate Grease and/or Sand/Oil Interceptor shall be installed, as specified herein, on the wastewater drainage system from any Affected Property as described above. The adequacy of the Grease and/or Sand/Oil Interceptor shall be determined by compliance with the design, sizing, and other requirements of this regulation.

(1) All drains from shop areas, washing areas and/or potential spill areas shall be connected to a Grease and/or Sand/Oil Interceptor. Fixtures to be connected include, but are not limited to, floor drains, engine/parts cleaning sinks and wash areas located in areas where sand and petroleum-based liquid waste containing materials may exist.

(2) Toilets, urinals and similar fixtures shall not waste through a Grease and/or Sand/Oil

Interceptor. Such fixtures shall be plumbed directly into the building sewer and waste system.

12.02 Definitions

a. "Affected Property" has the meaning set forth above.

b. "Grease" & "Sand/Oil Interceptor" shall be defined as a unit - designed using standard engineering principles for sedimentation and flotation in gravity separators to retain sand/oil from one or more fixtures and which shall be located remote from the fixtures being served, typically outside the building being served. -Baffles and good inlet design are required to deflect the flow across the surface areas of the units and sufficient grease and solids storage capacity is required. Grease traps and interceptors shall be rated for the designed flow-through rate of the unit in gallons per minute.

12.03 Design and Sizing

a. The design and sizing of a required Sand/Oil Interceptor shall be by the Owner's Engineer in accordance with the current edition of the Uniform Plumbing Code (UPC) as utilized by the local building permitting authority and these Regulations and shall be designed, sized, installed, maintained and operated so as to accomplish its intended purpose of intercepting the sand/oil from the customer's wastewater and preventing the discharge of such sand and oil to the Authority's wastewater treatment plant.

b. The size, type and location of each Grease and/or Sand/Oil Interceptor shall be approved by the Authority, in accordance with this Regulation. Except where otherwise specifically permitted, no wastes other than those requiring separation shall be discharged into any Grease and/or Sand/Oil Interceptor. One set of plans, including complete mechanical and plumbing sections shall be submitted to the Authority for approval prior to construction. Such plans shall include the size, type and location of each interceptor. Such approval shall not exempt the user from compliance with any applicable code, ordinance, rule, regulation or order of any governmental authority. Such approval shall not be construed as or act as a guarantee or assurance that any discharge is or will be in compliance with any applicable code, ordinance, rule, regulation, or order or any governmental authority. Any subsequent alterations or additions to such facilities shall not be made without due notice to and prior approval of the Authority.

c. Design

- (1) All waste shall enter the Grease or Sand/Oil Interceptor through the inlet pipe only.
- (2) Wastes in excess of 140 degrees Fahrenheit shall not be discharged into a Grease and Sand/Oil Interceptor and liquid discharged from a Grease and Sand/Oil Interceptor shall not exceed 104 degrees Fahrenheit.
- (3) Grease and Sand/Oil Interceptors shall be so designed and located as to be readily accessible for cleaning and/or inspection.
- (4) Grease and Sand/Oil Interceptors shall be constructed in accordance with the design specifications contained herein, and shall be approved by the Authority.
- (5) If an existing Grease and/or Sand/Oil Interceptor does not meet the design and sizing criteria as set forth, the interceptor shall be replaced with a properly designed and sized interceptor or may be allowed to continue use of the present system subject to requirements such as a clean-out frequency less than 60 days.
- (6) Upon change of ownership of any existing facility which would be required to have a Grease and/or Sand/Oil Interceptor under this Regulation, the applicant for sanitary sewer

service shall demonstrate that a properly sized and functioning Grease and/or Sand/Oil Interceptor is installed.

(7) Grease and Sand/Oil Interceptors shall be so designed that they will not become air bound if closed covers are used. The tank and the discharge line shall each be vented, and the vents shall not tie together less than 42 inches above the tank lid elevation.

(8) The discharge of each Grease and Sand/Oil Interceptor shall connect directly into a manhole.

d. Sizing Criteria

(1) Grease and Sand/Oil Interceptors: When determining the minimum size of Grease and Sand/Oil Interceptor required, the following shall be considered:

- a) The minimum acceptable volume shall be not less than one hundred (100) gallons.
- b) Every interceptor shall have sufficient capacity to perform the service for which it is provided.
- c) Interceptors shall be designed to provide for a minimum hydraulic retention time of 24 minutes at actual peak flow or 12 minutes at the calculated theoretical peak flow rate as predicted by the Uniform Plumbing Code fixture criteria, between the influent and effluent baffles with 20 percent of the total volume of the grease interceptor being allowed for sludge to settle and accumulate.

12.04 Installation

a. The installation of Grease and Sand/Oil Interceptors shall be in accordance with the current edition of the Uniform Plumbing Code (UPC) as utilized by the local building permitting authority and these Regulations, and shall be accomplished in a workmanlike manner in compliance with the design and sizing requirements hereunder.

b. The installation of a Grease and Sand/Oil Interceptor shall be accomplished by a licensed plumber with documented experience in the installation of such devices.

c. Each Grease and Sand/Oil Interceptor shall be readily accessible for inspection, servicing, and maintaining in proper working condition. The use of ladders or the removal of bulky equipment in order to inspect or service interceptors shall constitute a violation of accessibility. Where feasible, all interceptors shall be located outside of the facility served. Location of all interceptors shall be approved by the Authority, and shall be shown on the approved building plan.

d. Grease traps can be located under sinks at restaurants for non-cooking/preparation areas.

12.05 Maintenance

a. Grease and Sand/Oil Interceptors shall be maintained by regularly scheduled removal of the accumulated grease, sand and/or oil so that they will properly operate as intended to intercept the grease, sand and oil from the customer's waste water and prevent the discharge of grease, sand and/or oil to the Authority's waste water treatment plant.

b. Maintenance of Grease and Sand/Oil Interceptors shall be done only by a business/professional normally engaged in the servicing of such plumbing fixtures. An individual property owner will not be permitted to accomplish maintenance specified by this Regulation.

c. Maintenance shall be performed in a workmanlike manner before the retention capacity of the interceptor is exceeded. Detailed and accurate records of maintenance shall be maintained on-site and shall be provided to and available to the Authority upon request. Such maintenance records shall be in the form as approved by the Authority Manager. The records shall include detailed information relating to the amount of grease, sand and oil removed compared to the size of the Grease and/or Sand/Oil Interceptor and one copy of the completed form shall be provided by the customer and the maintenance business to the Authority immediately following completion of maintenance of any Grease and /or Sand/Oil Interceptor within the Authority's service area.

d. A copy of the invoice from the business/professional reporting the date the interceptor was cleaned, the amount of oil and/or sand removed and a recommendation of how frequently the interceptor should be cleaned must be sent to the Authority after each cleaning. A copy of all Sand/Oil Interceptor cleaning invoices are to be on file at the business being served and available to the Authority upon request. Failure to comply with the above could result in fines, penalties, or disconnection of service.

e. As a minimum, any Grease and/or Sand/Oil Interceptor in service shall be serviced at a maximum interval of 365 days. All users shall maintain a written record of maintenance performed on the interceptor for a minimum of three years. All such records shall be available for inspection by the Authority upon request.

(1) The Authority may inspect the interceptor and outlet and if it is deemed necessary by the Authority, more frequent servicing and maintenance will be required.

f. Biological treatment shall not be a substitute for the servicing of Grease and/or Sand/Oil Interceptors at the frequency determined by the Authority. Emulsification of oil and/or grease with enzyme treatments only delays physical separation. Oil and/or grease may then separate down stream and cause clogging problems in the collection system. A Grease and/or Sand/Oil Interceptor using biological treatment requires continuous monitoring, maintenance, and inoculation of the bacterial cultures.

g. The Authority may inspect the Grease and/or Sand/Oil Interceptor monthly to determine the load on the fixture and the effectiveness of maintenance activities. The Authority will inventory all Grease and/or Sand/Oil Interceptors in their service area and document the inspections of these interceptors.

(1) These inspections may determine that more frequent maintenance than previously specified is required.

h. Existing sources not connected to a Grease and/or Sand/Oil Interceptor which contribute grease, sand, grit and/or petroleum-based liquid waste to the Authority's waste stream and collection system will be identified through the Authority's inspection program. Once these sources are identified, they will be required to install a Grease and/or Sand/Oil Interceptor and maintain it according to these guidelines. In the time before a Grease and/or Sand/Oil Interceptor can be installed the Authority will require these businesses to implement Best Management Practices (BMPs) to keep grease, sand and oil out of the sanitary sewer system by:

- (1) Not dumping petroleum-based waste products into the waste collection system;
- (2) Discontinuing use of wash facilities until such time a suitable system is in place to intercept grease, sand, grit, and petroleum-based products;

- (3) Sweeping floors and other service areas with hand brooms and dispose of all sweepings as solid waste to minimize the use of wash down water to the greatest extent practicable;
- (4) Utilizing appropriate absorbent materials to contain and cleanup any spillage of petroleum-based products and disposing of all used absorbent materials as solid waste; and
- (5) Other practices identified by the Authority and/or facility which will decrease the point source discharge of grease, sand and oil.

12.06 Responsibility, Fines, and Compensation

- a. Property owners and lessees shall be jointly and severally responsible for cleaning Grease and/or Sand/Oil Interceptors, for maintaining the Grease and/or Sand/Oil Interceptor in an efficient operating condition at all times, and for otherwise complying with the provisions of the these regulations.
- b. The Authority reserves the right to levy fines against owners of Affected Property that do not conform to the Authority's Grease and Sand/Oil Interceptor regulations.
- c. Compensation shall be paid to any surrounding businesses and/or homeowners for damage resulting from any noncompliance of the Authority's regulations.
- d. Any extraordinary cost incurred by the Authority due to interference, damage or special processing necessary in the treatment and/or collection system shall be paid by the business. The direct cost of all labor, equipment and materials incurred in rectifying the interference or damage shall be billed directly to the business by the Authority. This shall also include any analytical testing of effluent discharged from the business.

12.07 Sewer Use Regulations

- a. This regulation forms a part of the Sewer Use Regulations of the Authority. Enforcement of this regulation is governed by the express terms hereof and the enforcement provisions of Article XII of the Sewer Use Regulations, which is incorporated by reference, including, without limitation, those provisions for administrative violations, violation of discharge limitations, enforcement procedures, penalties, field observations, and extra monitoring charges. Any violation of this regulation for Grease and Sand/Oil Interceptors shall be considered a discharge violation, major violation, under the enforcement provisions of Article XII of the Sewer Use Regulations. Compliance with this regulation, as well as the other provisions of the Sewer Use Regulations, shall be the joint and several obligation of the owner of the property served and any party in possession of the property using the waste water services of the Authority. Any monies due or penalties to the Authority under the provisions of the Sewer Use Regulations shall constitute a lien upon the property served.
- b. The Authority has the right to reject any waste which may be harmful to or cause obstruction of the publicly owned wastewater collection system or which may interfere with the operation of the publicly owned treatment works.

12.08 Application

This regulation applies to all existing and future uses within the scope of Section 12.01 of the above. Those Affected Properties currently conducting operations prior to May 1 2007 shall be exempt to these regulations, unless these Affected Properties would redesign or change the operation of the facility. The Authority has determined that the enactment of this regulation is in

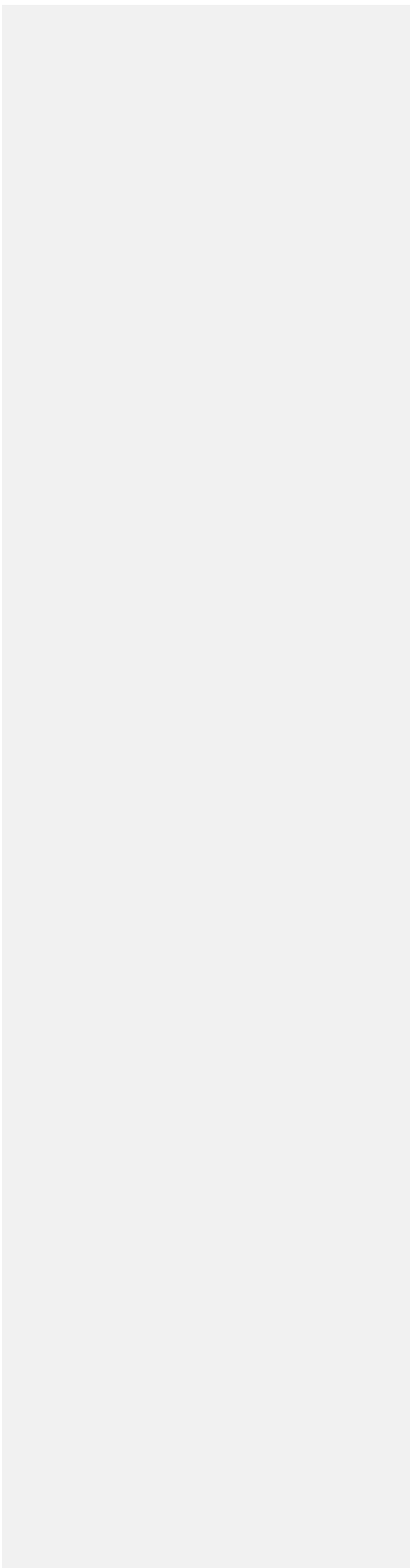
the best interest of the Authority and its customers and is necessary for the efficient and proper operation and protection of the Authority's operations and facilities and this regulation is necessary and in furtherance of the health, benefit, and welfare of the Authority's customers.

XIII DISCONNECTION OF SEWER SERVICE LATERALS

13.01

The Authority requires the capping off of any disconnected sewer service laterals and inspected by the Authority.

Capping off will be performed by the contractor prior to any demolition of a building or structure.



APPENDIX D

**AGREEMENT FOR THE CONSTRUCTION OF
SANITARY FACILITIES IN THE
MUNICIPALITY OF MURRYSVILLE
WESTMORELAND COUNTY, PENNSYLVANIA**

THIS AGREEMENT entered into this _____ day of _____,
2007, by and between:

THE FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY, a
municipality authority organized and existing under the laws of the
Commonwealth of Pennsylvania, with its principal office in the Municipality
of Murrysville, Westmoreland County, Pennsylvania (hereinafter called
"Authority"),

A N D

_____, a Pennsylvania corporation, with its principal office
located at _____, Pennsylvania, 15220
(hereinafter called "Developer").

W I T N E S S E T H:

WHEREAS, the Developer is engaged in the development of a certain Plan of
Lots to be known as _____, (hereinafter the "Development"), on
real estate located in the _____ of _____, title to which is
vested in the Developer by virtue of the deed recorded in the Office of the Recorder of
Deeds of the County of Westmoreland, Commonwealth of Pennsylvania, at
_____; and

WHEREAS, in order to complete the development, Developer is required to construct sanitary sewers through the Development; and

WHEREAS, it is to the mutual benefit of the Developer and Authority that the sanitary sewer system, when completed, be owned, operated and maintained by the Authority; and

WHEREAS, the Authority has established rules and regulations with respect to the construction and acceptance of sewer lines and a sewer collector system in a newly developed Plan of Lots; and

WHEREAS, Developer desires to comply with the requirements of said rules and regulations and to have the sewer lines and collector system, when constructed in the Development, be owned, operated and maintained by the Authority.

NOW, THEREFORE, in consideration of the mutual promises and covenants hereinafter contained, as well as in consideration of the fact that the parties intend to be legally bound hereby, it is agreed as follows:

ARTICLE I
DEFINITIONS

- 1.01. Act - The Municipality Authorities Act, 53 Pa C.S.A. §6501 et seq., including all amendments thereto, and its predecessor Act together with Act 203 of 1990 and all amendments thereto.
- 1.02. Agreement - This agreement. It is intended by the parties hereto that this Agreement shall be any Agreement referred to in the Act and otherwise required by the Act.

- 1.03. Allowable Domestic Sewage - Sanitary waste discharged by the System and its users, other than "Unacceptable Waters", as defined below.
- 1.04. Authority - Franklin Township Municipal Sanitary Authority, 3001 Meadowbrook Road, Murrysville, Pennsylvania 15668-1627.
- 1.05. Authority Engineer - Hatch, Mott MacDonald or as designated from time to time by Authority.
- 1.06. Authority's Estimated Cost of Project Construction - This shall include, but not necessarily be limited to, labor and material, engineering design. The Authority's Estimated Cost of Project Construction will take into consideration the Developer's Estimated Cost of Construction as prepared by Developer's Engineer.
- 1.07. Authority Inspector - The Authority, Hatch, Mott MacDonald, or other personnel as designated from time to time by Authority.
- 1.08. Authority Solicitor - McDonald, Snyder & Lightcap, P.C. or as designated from time to time by Authority.
- 1.09. Construction Drawings - Those drawings for construction of the System, approved by the Authority, prepared by _____ and labeled "Utility Plan for _____ Development attached hereto, made a part hereof, and marked Exhibit B.
- 1.10. Certificate of Completion - A statement issued by Developer or Developer's Engineer, certifying that the Project as set forth in this Agreement has been completed in accordance with the Construction Drawings, and that punch list items and minor road repairs and restoration have been completed.

- 1.11. Certified As-Built Project Costs - The as-built costs of construction incurred by the Developer related to the installation of the sanitary sewer line extension as certified by the Developer's professional engineer.
- 1.12. DEP - Commonwealth of Pennsylvania, Department of Environmental Protection.
- 1.13. DEP Permit - A permit issued by the Commonwealth of Pennsylvania, Department of Environmental Protection ("DEP") in the name of Authority for construction of "Developer's System," as defined below.
- 1.14. Developer's Name:
- Developer's Address:
- 1.15. Developer's Contractor - Firm or individual with whom Developer contracts. If Developer acts as its own contractor, then Developer also promises that any conditions and covenants imposed on Developer's Contractor shall be considered additional obligations of Developer.
- 1.16. Developer's Engineer - As designated from time to time by the Developer.
- 1.17. Developer's Escrow - The amount reasonably estimated by the Authority to secure the Authority's estimated costs of construction plan review, inspections, administrative, legal, engineering and accounting services involved in the construction.
- 1.18. Developer's System - Per those drawings approved by the Authority, prepared by and labeled "Utility Plan for _____" attached hereto, made a part hereof, and marked Exhibit B.

- 1.19. Effective Date - The effective date of this Agreement shall be the day and year first above written.
- 1.20. EPA - The United States Environmental Protection Agency.
- 1.21. Letter of Acceptance - That letter issued by the Authority directed to Developer stating that the Authority intends to accept ownership of the constructed System, pending and conditioned upon Developer's compliance with post-construction covenants as enumerated in Article V of this Agreement. The Letter of Acceptance shall not be issued by Authority until receipt of the Certificate of Completion and a determination by Authority that Developer has otherwise complied with the terms of this Agreement.
- 1.22. Notice to Proceed - Written notice from Authority to Developer, informing Developer that construction may commence. A Notice to Proceed shall be issued by Authority only after receipt of Construction Drawings, Developer's Estimated Cost of Project Construction, insurance certificates, applicable bonds, and confirmation that all necessary permits have been issued and remain in full force and effect.
- 1.23. Planning Module Submission and Developer's Checklist - A Developer's checklist prepared by Authority and given to Developer prior to commencement of construction.
- 1.24. Plan - That certain plan of subdivision prepared by _____ dated _____ and labeled " _____ " attached hereto, made a part hereof, and marked Exhibit C.
- 1.25. Specifications for Sewer Construction Manual - That certain design manual prepared by Authority's Engineer dated July 10, 1972, Revised January 2, 1974, January 1, 1978, March, 1984, August 17, 1989, and any subsequent revision adopted prior to the effective date and adopted

by the Authority to which the Developer shall prepare all construction drawings and construct the System in accordance therewith.

- 1.26. Tapping Fee or Fees - The tapping fee as that term is defined in the Rate Resolution of the Authority as amended from time to time.
- 1.27. Authority Sewer System - The sanitary sewer system of Authority, including all of the collector, trunk, and interceptor sewer lines, manholes, pump stations, treatment plants and all equipment, fixtures, mechanisms and other appurtenances and physical plants of Authority (whether or not they are owned or operated by Authority) and the appurtenances thereto.
- 1.28. Unacceptable Waste - Itemized list from Authority Rate Resolution, together with those items the Authority, DEP and EPA determine from time to time as unacceptable.
- 1.29. Unacceptable Water - Any water from a domestic residence not a part or component of the sanitary sewage system, domestic laundry or cooking (kitchen) water. Storm water is expressly prohibited from entry into the Authority sanitary sewer system.

ARTICLE II

COMPLIANCE WITH GOVERNMENTAL AUTHORITIES

2.01. Permits - Prior to commencement of construction, Developer shall obtain all permits from the Pennsylvania Department of Transportation (PennDOT), together with any other road permits as may be required by the Commonwealth of Pennsylvania, Westmoreland County, the municipality where the Development is located, or any other municipal, governmental or private or public utility having jurisdiction over the roads affected by the construction. Developer shall provide Authority with copies of all such permits.

2.02. **Developer's Compliance** - The Developer shall comply with all Ordinances, Resolutions, Rules, Regulations, Policies and Guidelines of the Municipality where the Development is located, the Authority, the County of Westmoreland, PennDOT and the laws of the Commonwealth of Pennsylvania, and the United States of America with respect to the construction and installation of the System, to the extent that such Ordinances, Resolutions, Rules, Policies, Regulations and Guidelines are constitutional and/or permitted by law. It is further distinctly understood and agreed that the Developer shall provide the Maintenance Bond as provide in this Agreement and Developer shall obtain and acquire any and all permits necessary for installation of the System. It shall be the responsibility of the Developer to obtain copies of any such Ordinances, Resolutions, Rules, Regulations, Policies, Guidelines and laws and to follow and comply with the same.

2.03. Approval of Municipality

(a) It is distinctly understood and agreed that the execution and delivery of this Agreement is contingent upon Developer obtaining the requisite approval from the Municipality where the Development is located with respect to the approval of this Project in regard to all matters, including construction of the System. In the event that the said approval should not be obtained and, upon the parties hereto being so notified in writing, this Agreement shall be terminated.

(b) The parties hereto agree that the Municipality where the Development is located is a third party beneficiary to the within Agreement and in the event that the Developer fails to comply with any of the Ordinances, Resolutions, Rules, Regulations, Policies, Guidelines or other requirements of that Municipality then and in that event, the Municipality may maintain and bring any civil and/or criminal action in its own name and right against Developer, but no action may be brought against the Authority.

**ARTICLE III
CONSTRUCTION OF DEVELOPER'S SYSTEM**

3.01. Developer's Escrow

(a) Developer and Authority acknowledge that as of the date of this Agreement, _____/100 DOLLARS (\$) has been deposited with the Authority to secure Authority's estimated costs of reviewing construction plans, inspection, administrative, legal, engineering and accounting services involved in the construction of Developer's System (the "Developer's Escrow").

(b) Authority shall be entitled to draw upon the Developer's Escrow to pay all of the costs it is billed by the Authority Solicitor and Authority Engineer or any cost which the Authority incurs by its own staff, or any other costs which it incurs as a result of the initial or subsequent review of Construction Plans, the preparation of this Agreement, submission of the application for all PennDOT approvals and permits, costs incurred during construction, costs of inspection, administrative, recording fees, or any other costs, direct or indirect, which the Authority may incur as a result of the construction of the Developer's System.

(c) Developer shall be required to replenish the Developer's Escrow when the Developer's Escrow has been reduced to fifty (50%) percent of the original deposit. Developer shall advance funds sufficient to increase the amount to the original Developer's Escrow amount within thirty (30) days from receiving written notice from Authority to do so, which notice shall include copies of all invoices which have been paid causing the reduction of the amount of the security deposit to fall below fifty (50%) percent of the original deposit.

(d) Within seventy-five (75) days after the issuance of the Letter of Acceptance, Authority will return the balance then remaining of the Developer's Escrow to the Developer, together with an accounting of all expenditures.

(e) Authority shall not be obligated to invest any portion of the Security Deposit in an interest bearing account. However, should the Authority determine to do so, then any interest earned shall belong to the Authority, notwithstanding the fact that the Developer's Escrow is the property of the Developer.

(f) Developer acknowledges receipt of the Authority fee schedule with respect to deposits required in connection with construction of the System, as may be amended from time to time.

3.02. **Construction of Developer's System** - Developer may commence construction of the System after receipt of Authority's Notice to Proceed and the issuance of all permits required by PennDOT and others having authority over same.

3.03. **Authority Rules and Regulations** - The Authority reserves the right to alter its rules and regulations from time to time; and if it does so, Developer agrees to change its construction techniques prospectively, after Notice by Authority to Developer to conform with the revised rules and regulations of the Authority. Adherence to all Authority Rules and Regulations is considered mandatory. Further, Developer also agrees to construct the System strictly in accordance with the specifications for the construction of sewers as adopted by the Authority, known as "Specifications for Sewer Construction Manual". Developer further agrees that in the event it enters into an agreement with any contractor for construction of the System as contemplated herein, Developer shall insert the above requirement in such Agreement with the contractor and furnish the contractor with a copy of same.

3.04. **Authority Inspection Requirements** - In addition to the above, all sewer lines are required to be air tested, lamped and mandrel tested, and, at the option of the Authority Inspector, smoke tested, television, dye, ex-filtration and any other testing that may be required, at the expense of Developer. All manholes are to be vacuum tested. Said tests must take place in the presence of the Authority Inspector, and the results of said tests must be reduced to writing for review by the Authority.

3.05. **Authority Inspector** - All construction shall occur in the presence of the Authority Inspector. If the Developer allows construction of any portion of the Developer's System to be constructed outside the presence of the Authority Inspector, at the option of the Authority Inspector; that portion of the Developer's System will be

deemed unacceptable and the Developer will be obligated to reinstall and reconstruct any and all portions thereof, if so directed.

Developer shall be responsible for all costs and expenses associated with this Inspector and an additional deposit may be required prior to construction of the System to cover the costs of the Inspector. In the event the Authority Inspector is unavailable, an authorized representative of the Authority from the Authority's Engineer, will cause a full time Inspector to be present during time of construction.

3.06. Construction Commencement - No construction shall commence on any portion of the Developer's System without the Developer first having obtained Authority's written Notice to Proceed and Developer having given forty-eight (48) hours prior written notice to the Authority office of Developer's intention to commence construction.

3.07. (a) Right of Entry - Developer agrees that the Authority and its representatives and agents shall have the right to enter upon Developer's Premises at any time for the purposes of inspecting the construction work to be performed hereunder, and in case any work shall be disapproved or rejected by the Authority and not corrected by the Developer within thirty (30) days after notice to correct such work, the Authority shall have the right to remove and replace said work, and the expense of such removal and replacement shall be charged to Developer.

(b) In the event unusual conditions or circumstances are encountered by the Developer in the course of construction of the System, which are not specifically covered by the Construction Specifications/Drawings, Developer will not continue the work unless the Authority first approves the procedure in accordance with good construction practice, and the Developer shall be responsible for any costs incurred for such construction.

3.08. Developer's Contractor - All sections of this Agreement which refer to the obligations of Developer's Contractor shall be attached to any construction contract

entered into with the Developer and Developer's Contractor, and the Developer's Contractor shall be obligated to comply with those sections.

**ARTICLE IV
CONSTRUCTION INSURANCE AND BONDING**

4.01. Insurance - Developer shall deliver to the Authority, prior to the commencement of any work in connection with said System, the following:

(a) A certificates of insurance, with an insurance company authorized to do business in the Commonwealth of Pennsylvania, certifying that each Developer is insured for public liability insurance in the minimum amount of \$1,000,000 for death and personal injury, per occurrence and property damage in the minimum limit of \$1,000,000 per occurrence, such insurance protecting the Developer and naming the Authority as an additional insured against third-party liability claims. Certificates of such insurance shall contain a provision that coverage afforded under said policies will not be canceled until at least thirty (30) days' prior written notice has been given to the Developer and the Authority. Developer shall also require any general contractor to have in place liability insurance, naming Developer and Authority as additional insureds.

(b) During the progress of construction of the System, Developer shall maintain such insurance as will protect it from claims under the Worker's Compensation Act and such other insurance as is required by law for all persons who shall be directly or indirectly employed by it in connection with construction of the System.

4.02. Bonds - Developer shall, upon execution hereof, deliver to the Authority a Performance and Completion Bond pursuant to the terms and conditions set forth in paragraph 4.02 (a) of this Agreement. The Performance and Completion Bond shall provide that in the event of default by Contractor and/or Developer, the Surety shall perform the terms and conditions of the Construction Contract and complete the work without restriction or limitation as to the outstanding principal amount of the Bond.

(a) A Performance and Completion Bond issued by an acceptable surety authorized to do business in the Commonwealth of Pennsylvania and executed by the Developer, in the amount of one hundred ten (110%) percent of the Authority's Estimated Cost of Project Construction, naming the Authority as obligee, certifying that the Developer will construct and complete the System, as provided herein and will perform in accordance with the terms of this Agreement and the rules and regulations of the Authority in connection with the construction of the System; provided, however, that said bond may be the bond of the Developer's Contractor for the identical purpose, naming the Developer and Authority as co-obligees.

(b) The Performance and Completion Bond, must specifically refer to the within Agreement by reference to the date hereof and must also contain as a condition of the obligation that the Developer shall well and truly perform or cause to be performed all of the obligations under this Agreement, and that all contracted labor and material associated with the completion of the improvements hereunder must be paid in full, or otherwise the obligation of the Bond shall remain in full force and effect.

(c) Authority may, at its sole option, waive placement by Developer of the Bond, and in lieu thereof approve such other types of financial security as permitted pursuant to paragraph 53 Pa. C.S.A. §5607 (d) (23) of the Act, which approval shall not be unreasonably withheld.

(d) Deliver to Authority any "hauling bonds" which the may be required by the Municipality where the Development is located.

(e) Deliver to Authority any PennDOT Road Occupancy Permit and/or Maintenance Bond and Agreement as may be necessary and required.

4.03. Authority's Right to Affect Work Stoppage. It is understood and agreed that Authority, by and through its Manager, Assistant to the Manager and any other authorized employee designated by the Board of Directors of the Authority, shall have the right, but not the obligation, to stop all construction work as it may pertain to the installation of the herein contemplated sewer line or lines in the event that it reasonably

appears that a safety or hazardous condition exists or may exist by the continuation of work that could cause serious bodily harm, injury or death to persons or property of the general public, any workmen and/or Authority personnel or other third party persons or property, public or private. In the event that work is stopped for the above reason, the Authority, if acting reasonably and in its best judgment, even though future events may prove it to be wrong, shall have no liability whatsoever and the Developer shall further indemnify, defend and hold harmless the Authority from and against any and all claims, suits, damages, judgments, penalties and interests as a result of Authority's action.

4.04. **Indemnification** - Developer shall be held responsible for accidents during construction of the System and to the fullest extent permitted by law, Developer shall indemnify, defend and hold harmless the Authority and its professional advisors, agents, servants, workmen and employees from and against all suits, claims, actions, damages, losses and expenses, including, but not limited to, attorneys' fees, and all suits, claims, actions, workers' compensation claims, damages, losses and expenses brought by any third parties, and/or employees of Developer or contractors and subcontractors of Developer, and for all costs or liability to which Authority may be held responsible, and for any injury or alleged injury to the person or property of another resulting from negligence or carelessness arising out of or resulting from the performance of the construction of the System or from any improper or inferior workmanship, or from inferior materials used in the construction of the System. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph 4.04.

ARTICLE V
POST-CONSTRUCTION COVENANTS

5.01. **Certificate of Completion - (a)** The Developer or its Engineer or other responsible agent as designated by Developer will issue a Certificate of Completion within five (5) days of completion of the construction contemplated under this Agreement. Authority shall issue to Developer a Letter of Acceptance after receipt of the Certificate of Completion a determination by Authority that Developer has complied with the terms of this Agreement.

5.02. **As-Built Drawings** - Within thirty (30) days after issuance of the Certificate of Completion, Developer shall submit to the Authority office three (3) sets of blue line "as-built plans" and one (1) set of "as-built mylars" of the Developer's System as constructed. The plans shall be at 1" per 50' horizontal scale and at 1" per 10' vertical scale. The mylar plans shall be at 36" x 24". In addition to the mylar plans, the Authority may require that the plans be submitted by electronic media in such format as the Authority or its Engineer may require. The as-built plans shall include: Plan and profile of view to scale, stationing of all service connections, elevations of all manhole inverts and castings, location of all other underground utilities and pipes, the distances between the utilities and any portion of the Developer's System and all other matters which are relevant to the continued operation and maintenance of Developer's System as determined by the Authority.

5.03. **Cost Certifications**

Within thirty (30) days from the date a Certificate of Completion is issued by the Authority, Developer and/or Developer's Engineer will cause a certified As-Built Project Cost Certificate to be issued which specifically delineates the actual cost of construction incurred by Developer.

5.04. **Plan Changes**

Developer shall also submit to Authority three (3) copies of all plans showing line changes and the location of all laterals. The plans shall also bear the original markings and notations as to all changes, including initials of Developer's Contractor and Authority Inspector, which shall be given by Developer's Contractor to

the Authority office within seven (7) days from the completion of Developer's System. In the event the Developer or the Developer's Contractor determine not to bring a lateral to at least the boundary line of the Premises, this must be duly noted on the plans in the field and initialed by both the Developer's Contractor and the Authority Inspector.

5.05. Maintenance Bond

(a) To further secure and insure this covenant to maintain the work, Developer shall furnish, after construction of the System and before Authority takes title to the System, a maintenance bond (the "Maintenance Bond") in the amount of fifteen (15%) percent of the certified "As-Built" Project Costs issued by an acceptable surety, authorized to do business in the Commonwealth of Pennsylvania, guarantying to maintain the stability of the work, as well as of the sewer pipe and other materials furnished in construction of the System, for a period of eighteen (18) months from the date the Authority takes title to the System, all in accordance with the Authority plans and specifications as described in Specifications for Sewer Construction as approved by the Authority.

(b) Authority may, at its sole option, waive placement by Developer of the Maintenance Bond, and in lieu thereof accept such other security in such amounts as Authority deems proper.

5.06. Entry of Unacceptable Waste and Water Into The Authority System

(a) All construction required of the Developer and the Developer's Contractor shall be accomplished in such a manner that only Allowable Domestic Sewage enters the System. Unacceptable Waste and Water shall not be permitted to enter the Authority Sewer System. In the event that Unacceptable Waste and Water enters the Authority's Sewer System from the Developer's System prior to the expiration of the Maintenance Bond, then Authority shall have the option of doing the following: (1) the Authority may remove the Unacceptable Waste and Water with the cost of removal to be paid by the Developer upon presentation of an invoice; (2) the

Authority may seal the Developer's System without any resulting liability to the Authority from the Developer or others lawfully using the Developer's System; (3) the Authority may require the Developer to remove the Unacceptable Waste and Water within the time provided in any notification to do so by the Authority; and/or (4) the Developer shall be responsible or liable for the payment of penal damages and fines as are otherwise authorized under the laws of the Commonwealth of Pennsylvania. Developer's liability for the entry of unacceptable waste and/or water into the Authority's System shall terminate upon the earlier of the Authority's acceptance of the dedication of the System pursuant to paragraph 5.07 of this Agreement or the connection of the first user to the System; provided, however, such termination shall be valid only upon receipt of Developer's certification that any and all purchasers or successors in interest shall be notified in writing of all requirements of the DEP and the Authority.

(b) If the Authority chooses to act pursuant to Section 5.06(a)(3) and in the event the Developer fails to remove the Unacceptable Waste and Water within the time limits required by the Authority in its notification to the Developer, then in addition to all other rights of the Authority and obligations and liabilities of the Developer pursuant to this Agreement, the Developer will pay the Authority the additional sum of One Hundred and no/100 (\$100.00) Dollars per day thereafter as a penal sum by reason of Developer's failure to remove the Unacceptable Waste and Water. In addition, the Authority may exercise such other remedies as are permitted under its Rules and Regulations, the laws of the Commonwealth of Pennsylvania and the Regulations of DEP and the EPA. The Authority may exercise all or any of the above-listed remedies either cumulatively or in the alternative on each occasion where Unacceptable Waste and Water enters the Developer's System and thereafter the Authority's Sewer System.

(c) In the event the Authority suffers and/or incurs costs or fines by reason of entry of Unacceptable Waste and Water into the Authority's Sewer System caused by Developer prior to the earlier of conveyance of the System to the Authority, or connection of the first user, then the Authority shall be entitled to reimbursement from the Developer upon written notice to do so. The failure on the part of the

Developer to make such reimbursement shall be considered a default under this Agreement. In such an event, the Authority may proceed against the Security Deposit, the posted security (Bonds), or any of its rights upon default as may be granted to Authority in this Agreement.

(d) Developer certifies that pursuant to Section 405 of the Solid Waste Management Act of 1980, that the Developer has no actual or constructive knowledge of any hazardous or toxic waste which was, is, or presently exists, or has been disposed of on the subject property, improvements, or any part thereof. In this connection, Developer does hereby indemnify, will defend and does hold harmless Authority from and against any and all claims, actions, causes of actions, in law or equity, filed or brought against the Authority by the Commonwealth of Pennsylvania Department of Environmental Protection or the United States Environmental Protection Agency making claim against the Authority for any loss, damage, interest, penalty, fine, or liability, foreseen or unforeseen, of any kind whatsoever.

5.07. Conveyance of System

(a) After inspection and approval of the construction of the System, Developer shall convey title of the System to the Authority within sixty (60) days of Authority's issuing the Letter of Acceptance. After acceptance of the System, the conveyed portion of the System shall be considered the property of the Authority as of the date of conveyance. Thereafter, subject to the maintenance bonding required of the Developer, which bonding requirement shall not exceed eighteen (18) months as set forth in paragraph 5.05 of this Agreement, Authority shall operate and maintain the conveyed portion of the System.

(b) No tap permits shall be issued until acceptance and conveyance of the within conveyed portion of the System to the Authority.

5.08. Maintenance and Repair Prior to Expiration Date

(a) Until expiration of the Bond, Developer shall be responsible for the full and complete maintenance and repair of Developer's System, including, but not limited to, System malfunctions such as ground settlement and restoration.

(b) In the event the Authority determines that maintenance and repair work is required prior to expiration of the Bond, the Authority shall then notify the Developer to make the necessary repairs. If the Developer or the Developer's Contractor does not make the necessary repairs within a period of thirty (30) days (or forty-eight [48] hours if Authority determines it to be an emergency) from receipt of the notice, then Authority shall have the right, but not the obligation, to accomplish the necessary repairs and bill the cost of repairs to the Developer. In the event that Developer does not pay for the cost of the repairs or make reimbursement to the Authority within the time stated in the invoice, then the Authority shall have the right to (1) reimburse itself from any Security Deposit then remaining; (2) proceed against the security posted; or (3) treat the failure to pay as a default by the Developer under this Agreement and proceed under the rights otherwise granted to Authority under Article IX of this Agreement. In addition, in the event of such occurrence, Developer agrees not to construct any remaining portion of the Developer's System thereafter.

5.09. Acceptance of Flow from Developer's System - Upon completion of construction, Authority will accept Allowable Domestic Sewage from any user in the Developer's System under the terms of this Agreement, provided:

- (a) All users will be charged uniform rates and costs in accordance with the Rules and Regulations of the Authority.
- (b) No connection of any user will be exempt from payment of the current Tapping Fee in effect at the time application for connection is made.
- (c) No user shall be permitted to cause a surcharge, or sudden increased flow to Developer's sewer, or the Authority Sewer System.

- (d) The construction shall be completed within three hundred sixty (360) days of the issuance of a Notice to Proceed by the Authority in accordance with the terms of this Agreement as required by any provision of any Developers Agreement with the Municipality where the Development is located.
- (e) No customer shall be permitted to connect into the Developer's System without prior written approval from the Authority. Developer covenants and agrees that it shall, under no circumstances, permit any person or party to tap into the System unless previously approved by the Authority.
- (f) If a Tap-in Permit is not acquired, and building lateral(s) not connected to the sewer system and inspected within twelve (12) months of the initial tap fee escrow deposit date, a Debt Service and Administration Charge will be instituted until such time as the tap is used.
- (g) The maximum load of Dwelling Units or Equivalent Dwelling Units (EDU's) as defined by the Rate Resolution permitted from the Developer's Sewer System shall be _____ EDU's as calculated in accordance with the applicable resolution of Authority.
- (h) Billing for all customer charges shall be in accordance with Authority rules and regulations.

5.10. Acceptance of Developer's System by Authority pursuant to Paragraph 5.07 and receipt by Authority of As-Built drawings with corresponding corrections made of any deficiencies found in the System are required prior to Authority issuing tap-in permits to Developer, unless written consent is first obtained from the Authority, which consent shall not be unreasonably withheld.

**ARTICLE VI
REIMBURSEMENT**

6.01. **Waiver of Reimbursement** - Developer acknowledges that Developer, individually and upon consultation with independent legal counsel, are fully aware of and familiar with Act 203 of 1990, Act 57 of 2003, and 53 Pa. C.S.A. §5607(b)(23). Based upon the above representation and after due and careful consideration, Developer hereby knowingly and willfully waives any rights it may have by virtue of the foregoing Acts. Notwithstanding anything to the contrary herein contained, Developer voluntarily hereby waives any and all rights it may have to reimbursement by the Authority or others for Developer's costs in construction of the System, either now or in the future.

**ARTICLE VII
PAYMENT OF TAPPING FEES**

7.01. **Payment of Tapping Fees** - Tapping Fees shall be due and payable at the time that any Application for a Tapping Permit is made.

7.02. **Additional Tapping Fees** - In the event additional tapping fees are due and payable in accordance with the applicable resolutions of Authority, then such additional fees shall be due and payable as enumerated therein.

7.03. **Other Charges Permitted** - The fees imposed in this Agreement are in addition to any charges, including user charges, to which the Authority is entitled to charge under the Act.

**ARTICLE VIII
RIGHTS OF WAY**

8.01. **Preparation of Rights of Way** - Developer shall be responsible for preparing a survey and/or right of way, thirty (30) feet wide during construction and

twenty (20) feet wide thereafter, showing all necessary information required for Authority's Solicitor to prepare legal descriptions for the areas not owned by the Developer which will be affected by installation of the System.

8.02. **Recorded Site Plan** - Developer shall furnish to Authority three (3) copies of the recorded Site Plan and/or Subdivision Plan as prepared by the Developer or Developer's Engineer showing all sanitary sewer easements as required by Authority.

8.03. **As-Built Survey** - It shall be Developer's responsibility to provide Authority with an As-Built Survey of the System within the Project showing the location of the sewer line as installed and of all rights of way located within the property which is not owned by Developer, together with ensuring that the sewer line is installed in the center line of the right of way. Authority shall not accept the conveyance of the System until "As-Built" drawings are received and approved.

8.04. **Obtaining Rights of Way** - It is the responsibility of the Developer to obtain all necessary rights of way, which shall always be in the name of Authority as grantee. If the Developer cannot obtain or are unsuccessful in obtaining the rights of way, Authority agrees to use its best efforts to obtain same. However, should Authority undertake soliciting rights of way, Developer shall be responsible to reimburse to Authority all of its costs in obtaining same. All rights of way must be obtained and recorded before Authority will issue a Notice to Proceed.

8.05. **Condemnation** - If Developer and Authority are both unsuccessful in obtaining the rights of way, Developer may then request the Authority to initiate condemnation procedures. Under no circumstance shall Authority be required to exercise its power of eminent domain and any exercise of said power shall be at the Authority's sole discretion.

8.06. **Costs** - Developer is responsible to pay for all rights of way and other recording fees incurred in construction of the Project. With respect to Condemnation, Developer is responsible for all costs of the Authority associated therewith, including,

but not limited to, legal fees, expert witness fees, engineering fees, filing costs and expenses, payment of verdicts, interest, settlements, costs of appeal, delay damages, and reimbursable fees to condemnees.

**ARTICLE IX
DEFAULT AND RIGHTS OF TERMINATION**

9.01. **Termination** - Failure of Developer to pay any portion of the Tapping Fee required under Article IX or to perform any other obligation under this Agreement shall be an incident of default and may result in termination of this Agreement.

9.02. **Discretionary Termination** - Authority shall have the right to terminate this Agreement by written notice to Developer in the event any of the following occurs:

- (a) Failure by DEP to approve the Planning Modules within a period of six (6) months following the date of this Agreement.
- (b) Failure by DEP to issue a Construction Permit within a period of twelve (12) months following the date of this Agreement.
- (c) Developer fails to provide the required insurance pursuant to Article IV.
- (d) Failure to perform any promise, condition or covenant contained herein.
- (e) Failure of any user to allow the Authority to perform any testing to determine if any Unacceptable Waste or Water is being discharged into the Authority sewer system. Developer shall not be held liable for any acts of users over which Developer has no control.

9.03. **Default by Developer** - In the event of Developer's failure to perform any of its promises, covenants and obligations hereunder, the same shall be considered a default. In the event of default by Developer, and if no cure has been made within ten (10) days after written notice of default has been given to Developer by Authority, then Authority shall have the following rights:

(a) To terminate this Agreement by written notice to Developer.

(b) To reimburse itself for any damages or costs from the Developer's Escrow tendered under Article III, or by proceeding against the security submitted under Article IV, subparagraph 4.02 or by proceeding against Developer in accordance with the Municipal Lien Act, as amended, the Authority shall first proceed against the Security Deposit for reimbursement and then against the security submitted under Section 4.02 of this Agreement. In the event the Developer's Escrow and/or the security both are insufficient to cover Authority's costs resulting from default, or insufficient for Authority to complete construction of Developer's System, and the Authority chooses to complete the construction of the System, then Developer shall reimburse to Authority any and all costs that Authority has expended (or is expected to expend) in completing said work, including reasonable legal fees, engineering fees and costs of suit.

(c) **Penal damages** - Developer's liability for the entry of unacceptable waste and/or water into the collection system shall terminate upon the earlier of the Authority's acceptance and dedication of the collection system or the connection of the first user to the System. Furthermore, all enforcement action taken pursuant to this Agreement shall provide Developer adequate due process and should be conducted in a manner consistent with the hearing and penalty provisions set forth in the Sewage Facilities Act; provided, however, that this termination of liability shall not end in the event there are latent defects not easily discoverable upon inspection.

9.04. **Effect of Termination and Default** - In the event of termination of this Agreement, Developer shall have any and all rights and remedies granted pursuant to this Agreement, in addition to any and all other rights and remedies it may have under

the common or statutory laws of the Commonwealth of Pennsylvania or the laws of the United States of America.

9.05. In the event of default by Developer, Authority shall have any and all rights and remedies heretofore granted it under this Agreement, in addition to any and all other rights it may have under the common or statutory laws of the Commonwealth of Pennsylvania or Laws of the United States of America.

9.06. Remedies cumulative - The remedies of Authority under this Article VIII shall be cumulative, and the Authority shall be permitted to exercise any one (1) or more of its rights at its discretion.

**9.07. Performance and Completion Bond and
Maintenance Bond Remittance**

(a) The Authority shall return to Developer by Certified Mail to Developer's last known addresses within sixty (60) days of the expiration of the Performance and Completion Bond and Maintenance Bond established in Articles IV and V of this Agreement, any funds remaining under the Performance and Completion Bond and Maintenance Bond, as well as any Security Deposit remaining under Article III, together with an accounting of all expenditures from the Bond and Security Deposit.

ARTICLE X - REMEDIES OF AUTHORITY

10.01. Waiver of Defenses - In the event Developer and its successors, administrators and assigns, fail to pay when due any charges imposed upon it pursuant to this Article, Developer and its grantees, executors, heirs, successors, administrators and assigns, hereby waive the filing of an Affidavit of Defense and for all other defenses which may be available to them and do hereby empower the Prothonotary or any attorney of any court of record in Pennsylvania or elsewhere to appear for Developer and on behalf of Developer to agree to the entry of an amicable action or actions for the recovery of the sewer rents and other charges herein provided and in

said amicable action to confess judgment in the amount of any sewer charges due and payable to Authority and to waive any defenses against Authority if and when Authority files a municipal lien against Developer in the amounts due Authority for unpaid sewer charges, rentals, costs and expenses. The obligation of Developer hereunder shall cease and terminate when Developer's grantees or tenants and successors and assigns assume and agree to be bound by the terms and conditions of this Agreement.

10.02. It is understood and agreed that the Court of Common Pleas of Westmoreland County shall have sole and exclusive jurisdiction and venue over any dispute, action, cause of action, litigation, etc. arising hereunder. Notwithstanding anything to the contrary herein contained, nothing shall preclude Developer from taking any appeal to any appellate court within the Commonwealth of Pennsylvania.

**ARTICLE XI
SPECIAL PROVISIONS**

11.01. IT IS UNDERSTOOD AND AGREED BY DEVELOPER that Authority neither guarantees nor commits itself to provide or in any other way assure the availability and delivery of a tap-in permit to Developer beyond those tap fee(s) deposited into the Authority's Tap Fee Escrow Account under the terms and conditions listed in paragraphs 11.02 through 11.06 below.

11.02. Funds deposited into the Tap Fee Escrow Account will reserve tapping rights. Such deposits will be applied toward the tapping fee payable at the time a Tap Permit is issued. Tap Fee Escrow Account deposits are non-refundable.

11.03. The funds deposited into the Tap Fee Escrow Account only reserves sewer tap availability. The Developer must apply for a tap application and permit prior to inspection of the sewer lateral.

11.04. Tap Permits for new construction will only be issued after a building permit has been acquired.

11.05. Should a Tap Permit not be acquired, and building lateral(s) not be connected to the sewer system and inspected within twelve (12) months of the initial deposit date, a Debt Service and Administration Charge will be instituted until such time as the tap is issued.

11.06. Deposits to the Surplus Fund are for lots within a specific development/site only and cannot be transferred from one development to another owned by the same developer or to another developer's development/site.

11.07. Should the tap fee increase while the deposit remains in the Surplus Fund, but before the issuance of a Tap Permit, additional fees shall be due and payable.

11.08. In the event Developer elects to assign a sewer tap to a party other than the original depositor, Developer shall deliver a letter of authorization to the Authority, indicating the lot number and respective tax map number.

11.09. In the event of a sewer tap assignment, Developer shall obtain reimbursement of the tapping fee from the assignee.

11.10. All eight inch (8") or larger sewer lines are to be air tested, lamped, and mandrel tested. Six inch (6") lines may be required to be air tested, lamped, and mandrel tested at the Authority's discretion.

11.11. All manholes are to be vacuum tested.

11.12. Force mains, if applicable, shall be hydrostatically tested at one hundred fifty percent (150%) of expected operating pressure.

11.13. Developer agrees that it will supply, at its own cost and expense, ABS ManPan manhole inserts in all manholes and/or water tight manhole lids as the Authority deems appropriate. Developer shall contact Authority for the approved vendor for the ABS ManPan manhole inserts and/or water tight manhole lids.

11.14. Developer further agrees that it will supply and insert stainless steel inserts in those manholes as the Authority deems appropriate not included in paragraph 11.13 above, at Developer's sole cost and expense. Developer shall contact Authority for the approved vendor for the stainless steel inserts.

11.15. Developer's Contractor shall submit three (3) sets of shop drawings for approval by Authority.

11.16. Developer's Contractor shall provide to Developer's Engineer the exact wye locations for incorporation into the "as-built" construction drawings. Developer's Engineer shall provide two (2) sets of lateral wye location forms for each lot included in this Project.

11.17. As part of the "as-built" drawings referred to in Section 5.02 of this Agreement, Developer is responsible to submit to the Authority the construction working drawings, as well as all sewer service lateral dimensions, including stationing, length and depth of the actual lateral locations for each lot for which sanitary sewer service is provided. If the actual lateral locations are not known, an internal inspection of the sewer line shall be done, utilizing closed circuit TV by a qualified company duly approved by the Authority to do such work. The results of the inspection shall be reduced to writing and submitted to the Authority, along with a copy of the videotape. All costs shall be borne by the Developer.

11.18. Developer's Contractor is further required to provide to Authority pre-construction and post construction photographs of the Municipal, PennDOT, and/or other roadways opened, bonded and/or traveled as deemed necessary by the Authority. Developer shall provide to the Authority copies of any Road Occupancy Permits and/or bonds and Hauling permits and/or bonds required. In lieu thereof, Developer shall provide to Authority written confirmation that said permits and/or bonds are not required.

11.19. Developer shall be under and subject to all rules, regulations, policies, procedures and practices of the Authority, together with any and all rules, regulations, policies procedures and practices of the United States Environmental Protection Agency, the Pennsylvania Department of Environmental Protection in connection with the quality and quantity of discharge as those rules and regulations may be amended from time to time.

11.20 As sales or conveyances of any lots or parcels of ground in the Development, Developer shall supply the Authority with the name of the grantee, the date of conveyance, and the recording data of the deed of conveyance within five (5) days of the date of settlement.

11.21 Developer shall provide a listing of each lot mailing address and the corresponding Tax Map Number immediately after the first lot is sold and is recorded at the Westmoreland County Office of the Recorder of Deeds.

ARTICLE XII
MISCELLANEOUS

12.01. It is specifically understood and agreed that neither Developer, contractors, or any subcontractors working thereunder shall be deemed to be the agent, servant, workman, officer or employee of the Authority or in any way or manner acting within the scope, agency and authority of the Authority; but, to the contrary, Developer, contractors and any subcontractors shall be deemed "independent contractors," acting on a mission and goal entirely of their own and in no way upon the specific business or agency of Authority.

12.02. **Billings and User Charges** - Billings for user charges shall be issued in accordance with rules and regulations applicable and in effect from time to time by Authority.

12.03. **Agreements Binding** - This Agreement shall be binding upon the parties hereto, their respective heirs, executors, administrators, successors and assigns. The covenants and promises contained herein shall be covenants running with the land and shall be enforceable against and to the benefit of the parties hereto and their respective heirs, executors, administrators, successors and assigns.

12.04. **Notices** - All notices required hereunder shall be given to Developer at the address listed under subsection 1.12; and to Authority at 3001 Meadowbrook Road, Murrysville, Pennsylvania, 15668, with a copy to the Authority Solicitor at 1004 Ligonier Street, Latrobe Pennsylvania, 15650; or to such other addresses as the parties hereto shall direct from time to time.

12.05. **Time is of the Essence** - It is understood and agreed that time shall be of the essence for all covenants, promises and obligations contained in this Agreement.

12.06. **Executed Counterparts** - It is understood and agreed that this Agreement has been executed in three (3) counterparts, any one of which may be used as the original.

12.07. This Agreement expresses the entire agreement between the parties and may not be altered or modified except in writing executed by each of the parties.

12.08. The parties hereto agree to execute and deliver all documents and to perform all further acts that may be reasonably necessary to effectuate the provisions of this Agreement.

12.09. In the event that any clause or provision of this Agreement is declared invalid, void or unenforceable by any administrative agency of the United States or the Commonwealth of Pennsylvania or any court having jurisdiction, the same shall be deemed severable from this Agreement and shall not affect the validity or enforceability of the remaining portions of this Agreement.

12.10. This Agreement and the construction and enforceability thereof shall be interpreted under the laws of the Commonwealth of Pennsylvania and any dispute or litigation arising hereunder shall be heard and decided by the Courts of Common Pleas of Westmoreland County which would have sole and exclusive jurisdiction and venue over any disputes, litigation, claims or demands arising hereunder. Nothing contained herein shall preclude Developer from taking an appeal to the appropriate Appellate Court within the jurisdiction of Pennsylvania or the United States of America.

IN WITNESS WHEREOF, and intending to be legally bound hereby, the parties have caused this instrument to be executed the day and year first above written.

ATTEST:

FRANKLIN TOWNSHIP
MUNICIPAL SANITARY AUTHORITY

Secretary

_____ By
Chairman

WITNESS:

DEVELOPER:

COMMONWEALTH OF PENNSYLVANIA)

) ss:

COUNTY OF WESTMORELAND)

ON THIS _____ day of, 2007, before me, a Notary Public, the undersigned officer, personally appeared _____, who acknowledged himself to be the Chairman of THE FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY, and that he, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

Notary Public

My commission expires:

* * * * *

COMMONWEALTH OF PENNSYLVANIA)

) SS:

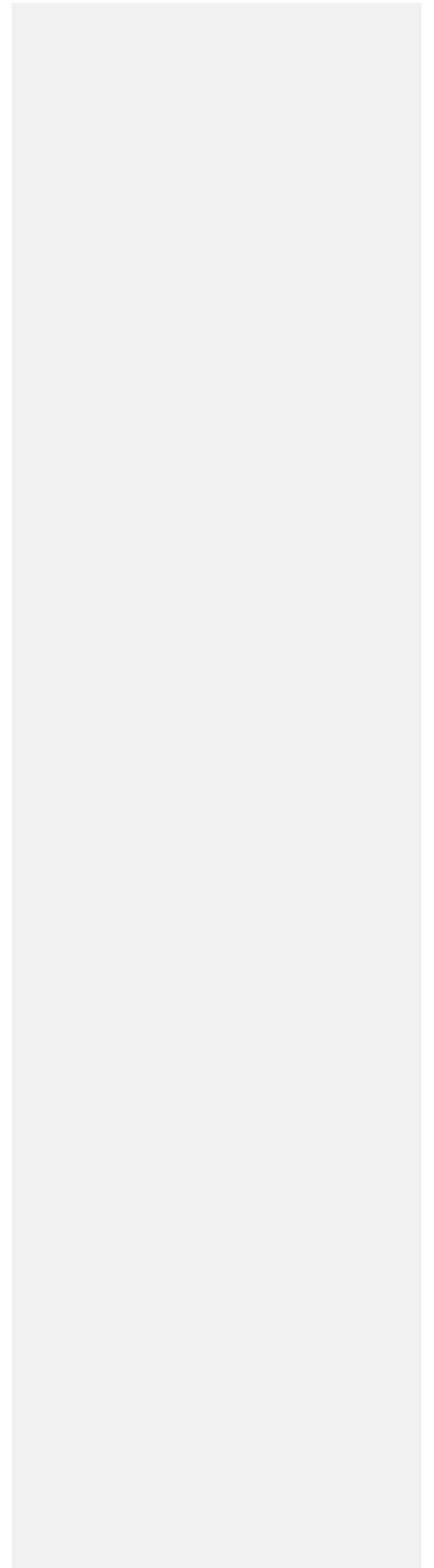
COUNTY OF WESTMORELAND)

ON THIS _____ day of, 2007, before me, a Notary Public, the undersigned officer, personally appeared _____ who acknowledged himself to the _____ of _____, a corporation, and the he as such _____, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the corporation by himself as _____.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

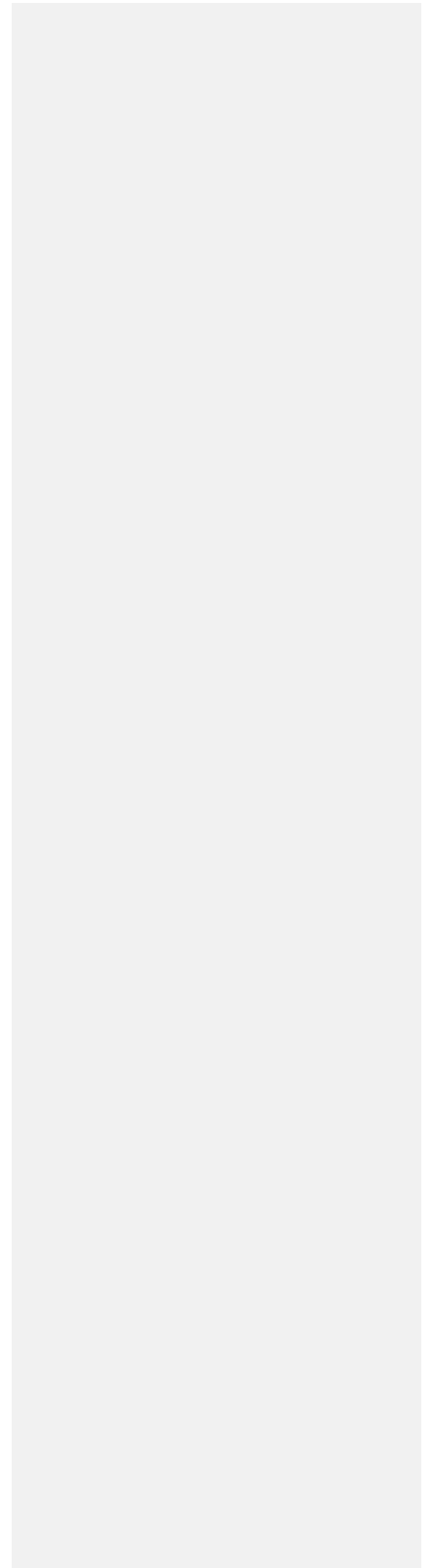
Notary Public

My commission expires:



THE ORIGINAL OF THE DEVELOPMENT PLAN MADE FOR _____ SEWER
LINE EXTENSION IS FILED WITH THE ORIGINAL OF THIS AGREEMENT AT THE
OFFICE OF THE FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY.

EXHIBIT B



THE ORIGINAL OF _____ SEWER LINE EXTENSION IS FILED WITH THE ORIGINAL OF THIS AGREEMENT AT THE OFFICE OF THE FRANKLIN TOWNSHIP MUNICIPAL SANITARY AUTHORITY.

EXHIBIT C

APPENDIX E

RESOLUTION NO. 08-01 REGULATING INSURANCE, BONDING AND ESCROW DEPOSITS FOR DEVELOPER CONSTRUCTION OF SANITARY SEWER SYSTEM PROJECTS

RESOLVED by Franklin Township Municipal Sanitary Authority (“FTMSA”) that in all cases where an improvement to the public sanitary sewer system, including but not limited to sanitary sewer line or lines, manholes, lift stations or treatment facilities (together “Sewer System Improvements”) are to be constructed by a developer, private property owner or other individual or entity other than FTMSA in the area serviced by FTMSA (“Developer”), then the following shall apply whether or not planning modules, exemption from filing planning modules or other permits are required from PaDEP:

1. Insurance Requirements:
 - A. Where Estimated Cost of Construction is in Excess of \$10,000 – Evidence of liability insurance coverage in such form and amount (but no less than \$1 Million) as is satisfactory to the FTMSA Solicitor (“FTMSA Solicitor”), and which shall name the FTMSA as an additional insured.
 - B. Where Estimated Cost of Construction is Less than \$10,000 – Evidence of liability insurance coverage in such form and amount (but no less than \$500,000) as is satisfactory to the FTMSA Solicitor, and which shall name the FTMSA as an additional insured.
 - C. Specific Requirements – All liability insurance required hereunder shall be written with an insurance company licensed to do business within the Commonwealth of Pennsylvania, and in addition to other standard provisions, shall provide that the insurance company shall not be permitted to cancel the insurance without first giving at least ten (10) days prior written notice to FTMSA.
 - D. Evidence of Coverage – The minimum evidence of coverage required shall be a certificate of coverage issued by the insurer or insurer’s agent. In the event that there are any limitations listed on the certificate or any attachment thereto, then in addition, submission of any endorsement required in order to evidence the required coverage shall be submitted. All certificates shall be subject to the prior approval of the FTMSA Solicitor.
 - E. Time for Submission – All and required insurance certificates shall be submitted and be approved prior to the commencement of any construction of the Sewer System Improvements.
2. Bonding Requirements:

- A. General – Prior to the commencement of construction of the Sewer System Improvements, a Developer shall submit the performance bond listed in subparagraph B hereafter together with written evidence that Developer shall post the required maintenance bond listed in subparagraph C.
- B. Performance Bond - A performance bond in the amount of 110% of the Cost of Construction as defined hereafter shall be submitted and which shall extend for the later of (i) one (1) year from the date of issuance of the bond or (ii) the date of completion of the Sewer System Improvements as evidenced by a certificate of completion issued by the FTMSA Engineer (“FTMSA Engineer”). If the party posting the performance bond requires more than one (1) year from the date of posting to complete the Sewer System Improvements, the performance bond shall be increased on the anniversary date of the performance bond by the greater of 10% of the original bond amount, or 110% of the cost of completing the required improvements as re-established on or about the expiration of the preceding one (1) year period, with the cost of completing the required improvements to be established in accordance with the provisions of 53 Pa. C.S.A. §5607(23).
- C. Maintenance Bond – Once a Certificate of Completion for the Sewer System Improvements has been issued by the FTMSA Engineer, then the Developer shall cause to be posted financial security (the “Maintenance Bond”) to secure the structural integrity of the Sewer System Improvements as well as the functioning of the Improvements in accordance with the design and specifications as depicted on the final plat, the Reimbursement or Developer’s Agreement and the Authority’s rules and regulations. The amount of the Maintenance Bond shall be 15% of the actual cost of the installation of the Sewer System Improvements as determined by the FTMSA Engineer, and shall extend for a period of 18 months from the date of the Certificate of Completion. The performance bond shall not be released until the Maintenance Bond has been posted.
- D. Letter of Credit Alternative – In lieu of a corporate bond, the requirements of subparagraphs B and C above shall be satisfied by a letter of credit or such other financial security as is approved by the FTMSA Solicitor provided that the same is submitted in the required amount and form as is approved by the FTMSA Solicitor.
- E. FTMSA as Listed Obligee – Whether a corporate bond or a letter of credit, FTMSA must be specifically named obligee, payee and beneficiary of the approved submission.
- F. Requirements of Bond – All security posted hereunder shall guaranty FTMSA full and complete performance by both the Developer and Developer’s Contractor, guarantying FTMSA against any deficiencies in the Sewer System Improvements which are to be constructed and guaranty all costs of repair and maintenance thereof until the Expiration Date.

3. Required Escrow Deposit:

- A. Escrow Deposit - The minimum escrow deposit ("Escrow Deposit") shall be \$2,500.00 plus 5% of the Cost of Construction as defined hereafter for the first \$500,000.00, plus 1% of the Cost of Construction in excess of \$500,000.
- B. Tender of Escrow Deposit – The above total Escrow Deposit shall be paid prior to the FTMSA Board entering into the Standard Construction Agreement.
- C. Use of Escrow Deposit – The Escrow Deposit shall secure any and all costs incurred by FTMSA by (i) to reimburse the FTMSA Engineer for the cost of engineering review, inspection and other services incurred and bills or any other costs or charges incurred or charged by the FTMSA Engineer and resulting from the Sewer System Improvements, (ii) any and all costs or fees incurred or charged to FTMSA by the FTMSA Solicitor and resulting from Solicitor review, meetings with the Developer or his agent, preparation of any required developer or other agreements, negotiations, time involved in right of way acquisitions, reimbursement for any fees or expenses incurred in any litigation resulting from the Sewer System Improvements and any other miscellaneous costs or fees incurred by the Solicitor resulting, and (iii) any costs or expenses resulting to FTMSA, including but not limited to the cost of any administrative, staff or field personnel for any services rendered and resulting from the proposed Sewer System Improvements, the cost of any testing or the use of FTMSA equipment, all of which shall be in accordance with fee schedules published from time to time by FTMSA, and any costs incurred resulting from administrative review.
- D. Draws Upon Escrow Deposit – FTMSA shall be entitled to draw upon the Escrow Deposit to pay for all fees and costs which are incurred by FTMSA or are billed by the FTMSA Engineer or the FTMSA Solicitor and which result from the Sewer System Improvements. Any costs of inspection shall be at the going billing rate of the FTMSA Engineer at the time that said costs are incurred.
- E. Depletion of Escrow Deposit – In the event that the amount of the Escrow Deposit at any time is reduced to less than \$1,000.00, then the FTMSA staff shall submit notice of the same to the Developer who shall advance sufficient monies to increase the amount of the Escrow Deposit to no less than \$2,500 within 14 days from receipt of said notice.
- F. Term Required for Escrow Deposit – The Escrow Deposit shall remain in place until the Expiration Date, and within sixty (60) days thereafter, FTMSA staff shall cause any balance then remaining to be returned to Developer together with an accounting of all expenditures (after receipt of written request by the Developer to do so) from any monies advanced. Provided that no interest shall be due and payable

to any Developer by FTMSA resulting from any investment that FTMSA staff may make of the Escrow Deposit.

G. Escrow Deposit - The escrow deposit required under paragraph 3.A. above shall be applicable whenever there are Sewer System Improvements to be constructed by the Developer. In all other cases where FTMSA action is required for a development other than (i) allocating a sewer tap under an existing corrective action plan, or (ii) the issuance of a sewer tap permit, the required Escrow Deposit shall be \$1,000.00, payable no later than the close of business on the next business day following the date that FTMSA grants approval for the development. In such cases, the Escrow Deposit shall be used in accordance with the provisions of paragraphs 3.C. and 3.D. above. Once all required approvals for the development have been obtained from PaDEP and the municipality, FTMSA Staff shall return any balance then remaining from the Escrow Deposit within thirty (30) days after receiving written request from the developer.

4. Cost of Construction – The Cost of Construction for any of the Sewer System Improvements referred to herein shall mean the cost to the Developer of the following: (i) The cost of all labor and material resulting from any and all grubbing, excavation, installation or construction of the Sewer System Improvements; (ii) all engineering design and oversight during the construction process; (iii) all performance and maintenance bonds as are otherwise required by FTMSA; (iv) the cost of all right of way acquisitions; and (v) the cost of any and all other costs or charges to be incurred by the Developer as a result of the construction and thereafter the dedication of the Sewer System Improvements to FTMSA. The cost of construction shall not include the cost to Developer of constructing lateral sewer lines or any other installations which are not to be transferred or dedicated to FTMSA as part of the undertaking of Developer. The Cost of Construction shall be the amount estimated submitted by the FTMSA Staff and/or the FTMSA Engineer after submission of the required construction drawings by the Developer.
5. Effective Date of Resolution – This Resolution and the requirements herein shall apply to all applications submitted on and after the date of adoption hereof.

ADOPTED this _____ day of _____, 2008.

ATTEST:

FRANKLIN TOWNSHIP MUNICIPAL
SANITARY AUTHORITY

Secretary

By: _____
Chairman

**APPENDIX F
RULES AND REGULATIONS FOR THE
CONSTRUCTION OF CONNECTING SEWERS**

1. PROCEDURE

The general procedure required in the installation of private connecting sewers is summarized as follows:

- (a) Submit application for permit to construct private connecting sewer on form provided by Authority upon request.
- (b) Examine the as-built sewer plans of the Authority available at the Manager's office to determine the referenced location of the service wye for the property to be served and, to discuss with the Manager and/or inspector any particular conditions of the proposed construction requiring special attention.
- (c) Locate and uncover the end of the Authority's service sewer and the building drain at the point connections are proposed. Prior to any further excavation, determine the elevation of and the required grade between the two points, to assure that the minimum allowed grade can be met.
- (d) Proceed with further excavation between these two points
- (e) Lay pipe from, lateral or service wye, or if none exists, from service connection made in presence of Authority inspector, including inspection stack near property line upgrade to near the point of connection to the building drain. The inspection stack shall be constructed, with watertight joints and a top section of Ductile iron pipe extending a minimum of one foot below the finish ground surface, and a minimum of six inches above the ground surface. A bronze cleanout plug shall be installed over the top of the inspection stack, which shall be removable for visual inspection of the building sewer. Care shall be taken to keep the stack vertical so that visual inspection may be completed. The basement slab shall not be poured and all under floor facilities must be visible for inspection. If the slab has been poured, the slab must removed and all facilities made visible for inspection. No backfill shall be made on the building sewer, and it shall be visible or inspection the trench as been i.e. service sewer will plugged by the Authority until the trench has been re-excavated and the pipe is visible.
- (f) Request inspection by Authority of exposed piping, in which particular attention will be given to:

Installation of a suitable trap or traps of the hand hole type on the building facilities.

Facilities for conducting roof drainage at least ten feet away from the building and away from the sanitary sewer and the foundation. Facilities for draining the foundation drain away from the building and the sanitary sewer.

Connection of prohibited facilities to the sanitary sewer . Included in these facilities are: depressed driveway drains, outside cellar stairwell drains, outside window wells, downspouts, foundation drains, or any facility conducting storm water into the sanitary sewer by any means.

The slope of the building sewer to the tee at the inspection stack, which shall be a minimum of $\frac{1}{4}$ inch per foot if possible.

Conformance of materials used in the construction of sewers with the "Rules and Regulations for the Construction of Connecting Sewers".

Tightness of joints in pipes and use of mortar or other prohibited materials in joints.

The Applicant shall correct any deficiencies noted by the inspector in accordance with these requirements.

Upon completion of a satisfactory inspection, the slab may be poured and backfill of the sanitary sewer may then be completed.

When the structure has been completed, and before title has been transferred or occupancy permitted, the Applicant shall call for a final inspection, at which time a water test may be made on all prohibited facilities to determine that they are not connected to the sanitary sewer. A block will be inserted in the sanitary sewer at the inspection stack to conduct the test, and will not be removed until any required corrections have been made. Upon correction, the stopper will be removed from the sewer line. The building sewer may then be used for conveying sanitary waste.

2. TYPE OF PIPE

The pipe used for connection sewers shall be 40 polyvinyl chloride (PVC) conforming to ASTM 0-3034 or ASTM F-789, ASTM 0-1527 Schedule 40 or ASTM D-2282 (SDR-21); acrylonitrile butadiene-styrene (ABS), or ductile iron. ASTM F-789 pipe (type PS-46) shall use T-3 resin, compound classification 12164A. Joints shall be compressed gasket type for PVC and ABS and rubber-ring type for ductile iron pipe. PVC pipe shall conform to ASTM D-3034--(SDR-35), and ABS pipe shall conform to ASTM D-2751. Ductile Iron pipe shall conform to the requirements of the Ductile Iron Pipe Research Institute. Latest ASTM standards apply. All PVC pipe shall be protected from sunlight by an opaque covering during storage. **Rigid connections are required when connecting to main or lateral lines.**

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3. MINIMUM SIZES AND GRADES

Minimum pipe diameter shall be six (6) inches. Minimum pipe slope, when available, shall be 1/4" per foot.

4. CLEANOUTS AND TRAPS

The use of outside traps on the new service lines is required only for buildings which do not have all inside fixtures and drains trapped and vented. The use of cleanouts on the new service line is required. Cleanouts are permitted for special conditions of alignment, as may be desired by the property owner. When traps and/or cleanouts are to be installed on new service lines, they must be installed as shown in the "Detail of Service Sewer". All trap vents must extend to at least six inches above the finished ground surface and must have a commercially manufactured vent cap to keep out leaves, debris and animals. Cleanouts must have watertight caps and must be at or above finished grade. Cleanouts must remain uncovered permanently. Substitutions from specified fittings must be approved by the Authority Manager. Trap vents and cleanouts must be laterally supported with properly compacted backfill, and must not be installed in driveways where they are subject to damage from vehicular traffic and/or used as an area drain for surface water. Cleanouts shall, be placed approximately every 100 feet.

Establishments which discharge grease or oil, such as restaurants, must have two or more grease and oil traps installed in series. The grease and oil traps must be approved before installation by the Authority Manager.

5. **PIPE LAYING AND BACKFILLING**

Following trench preparation, pipe laying shall proceed upgrade with the pipes laid carefully, hubs upgrade, spigot ends fully entered into adjacent hubs and true to line and grade. Each section of pipe shall rest upon the pipe bed for the full length of its barrel with recesses excavated to accommodate bells or couplings. Each pipe shall be firmly held in position so that the invert forms a continuous grade with the invert of the pipe previously placed. The interior of all pipe and the inside of the bell and outside of the spigot shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by means of plugs or other approved devices. Under no condition, shall pipe be laid in water or on subgrade containing frost, and no pipe shall be laid when trench conditions are unsuitable for such work. After the sewer has been installed, inspected and approved, and proper connections made, the area around the pipe shall be carefully backfilled with clean earth or class 2A aggregate or better by shovel and tamped with hand equipment in four (4) inch layers to a depth of at least two feet above the top of the pipe. The backfill shall be solidly rammed down and tamped around.

6. **TIMING**

Where a new building is to be constructed and connected to the Authority's system, the connecting sewer must be constructed after the new building is under roof to preclude any excavation drainage from entering the Authority's system.

7. **INSIDE PLUMBING**

All inside sanitary plumbing must conform to the latest edition of the International Building Code as adopted by the Municipality of Murrysville.

8. **CONNECTIONS TO EXISTING MANHOLES**

Connections to existing manholes must be made with a rubber water stop gasket and the manhole wall repaired with hydraulic cement.

**G. APPLICABLE SECTIONS OF PENNDOT SPECIFICATIONS,
FORM 408**