Town of Penfield
Design and Construction Specifications

Prepared by:
Town of Penfield
Engineering Department
3100 Atlantic Avenue
Penfield, New York 14526

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Major changes are highlighted in RED below
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SECTION 1 - INTRODUCTION

This document is the official design specifications for the development of any property within the Town of Penfield. The primary goal of these specifications is to promote proper design and construction of publicly dedicated facilities that will serve the residents of the Town of Penfield. This will be achieved through a design review process and construction inspection. These specifications are intended to provide facilities that will have a positive effect on the health and general welfare of the community. All projects shall promote the highest quality of dedicated Town infrastructure and provide for ease of future maintenance.

It is not the intent of the booklet to conflict with zoning policies or general overall supervision of development by the Town Board, the Planning Board, or other authorized agencies. Rather, it is intended to supplement such policies by providing the technical details, aesthetic features, and design guidance.

Developers and their engineers bear the responsibility of insuring that the designers and contractors familiarize themselves with these specifications and to take necessary steps during construction.

**THE DEVELOPER SHALL NOT START ANY SITE WORK UNTIL ALL PLANS HAVE BEEN SIGNED, ALL PERMITS ARE OBTAINED, ALL EASEMENTS HAVE BEEN FILED, A LETTER OF CREDIT HAS BEEN ESTABLISHED, AND A PRE-CONSTRUCTION MEETING HAS BEEN HELD.**

Any waiver from these specifications must be approved by the Town Board. All requests must be submitted in writing to the Engineering Department.
SECTION 2 - RESPONSIBILITIES

2.1 GENERAL
The responsibilities for each agency or department listed below shall include, but are not limited to the following:

**Design Engineer**
1. Act as the agent for the developer.
2. Coordinate with town staff regarding design issues.
3. Design all work in accordance with Town, County, and State specifications.
4. If applicable, prepare a Stormwater Pollution Prevention Plan in accordance with the current NYSDEC regulations.
5. Apply for permits as required and provide copy of all information, including the permit, to the Town.
6. Provide or obtain other engineering services as directed by the staff or governing board.
7. Provide sufficient copies of signed plans to Town, as directed.
8. Coordinate with utility companies, developer, and contractor for attendance at pre-construction meeting.
9. Prepare change orders and submit to Town Engineer for approval.
10. Prepare record drawings in accordance with the specifications and submit digital and reproducible copy to the Town.

**Developer**
1. Make necessary application to appropriate board.
2. Comply with all conditions of approval.
3. Acquire required signatures on original map(s).
4. Furnish town with Irrevocable Letter of Credit in an approved format.
5. Request pre-construction meeting prior to the start of any construction.
6. File required map with Monroe County Maps and Surveys.
7. Construct all utilities and facilities in accordance with specifications.
8. Provide the town with all necessary maintenance bonds upon completion of work, final inspection, and approval of utilities/facilities to be dedicated.
9. Responsible for protection of the environment and roadways during all phases of development.
10. Sign SWPPP and provide adequate resources for compliance with current Construction Permit.
11. Provide copies of inspection reports to Engineering Department.

**Planning Department**
1. Receive plans for site plan and subdivision review.
2. Place developer on agenda for Planning Board meetings once application is deemed complete.
3. Prepare agenda for Planning Board meetings.
4. Prepare legal advertisement for hearings.
5. Review plans for compliance with Town Codes.
6. Distribute plans for review to other town departments, agencies, and boards as needed.
7. Receive and record of all necessary fees at time of application.
8. Receive, review, and record all easement documents.
9. Site plans for one-lot residential developments and commercial development of less than 1,000 square feet may be reviewed administratively, as determined by Town Planner.
10. Insure all projects comply with SEQRA.
**Building and Zoning Department**
1. Place developer on agenda for Zoning Board meetings, as needed.
2. Prepare legal advertisement for hearings.
3. Review plans for compliance with Town Codes.
4. Refer plans to appropriate officials, agencies and boards when received.
5. Keep a record of all applicable fees.
6. Maintain related inspection records and time sheets.
7. Issue building permits.
8. Inspect buildings for compliance with approved Building Code and Town regulations.
9. Issue conditional and final Certificates of Occupancy.

**Engineering Department**
1. Review plans for all proposed developments related to roadway layouts and connections to existing roadways, utilities, safety, compliance to specifications, erosion and sedimentation control measures, grading, GI practices, and sidewalks.
2. Review and approve street lighting.
3. Review record drawings for accuracy and content.
4. Review and approval of the engineer’s estimated costs for improvements.
5. Provide inspections of constructed facilities and improvements.
6. Oversee activities for compliance with approved plans.
7. Review all change orders and review with appropriate department or review.
8. Provide interpretation of Town Specifications where necessary.
9. Schedule and chair pre-construction meetings upon receipt of all required drawings, fees, and documents.
10. Review of traffic reports and studies.
11. Hire consultants, where necessary, to assist in review of all applications.
12. Process all billings for inspection services and bill developer’s for excess or overtime costs.
13. Approve and process all releases from developer’s Irrevocable Letter of Credit or cash deposit.
14. Review and oversee activities of the Town’s Landscape Consultant including review and approve landscape plans, verify all landscaping values for letters of credit, and provide inspection of completed works.

**Public Works Department**
1. Review and approve dedicated street design and layouts.
2. Maintain all dedicated roadways.
3. Bill developers for street signs.
4. Inspect installation of all storm, sanitary sewers, and dedicated roads.
5. Televise sanitary sewers after completed installation.
6. Inspect related town dedicated sanitary sewer facilities and improvements prior to termination of warranty periods.
7. Inspect related town dedicated streets prior to termination of warranty period.
8. Prepare resolution to Town Board for dedication of completed roadways.
**Town Board**
1. Review and consider dedication of roads.
2. Review and consider special districts.
3. Review and consider special permits.
4. Review and consider waivers from town design specifications, street tree policy, and sidewalk policy.
5. Review and consider revisions to the design specifications.
6. Review and consider all changes to fees.
7. Review of all site plans under Incentive Zoning or any development in the LaSalle’s Landing District or the Four Corners District.

**Fire Marshal**
1. Review and approve, with the appropriate fire commission, the location of emergency access.
2. Verify the location and design of hydrants, fire lanes, and sprinkler systems.
3. Approve temporary and permanent fuel storage facilities and issue permits.
4. Approve temporary heating for buildings under construction/renovation.
5. Approve fire sprinkler systems.
6. Sign all approved site development plans.
7. Coordinate and approve blasting activities and issue permits.

**Planning & Development Services Department**
1. Accept, review and distribute all projects seeking town approvals.

**Town Clerk**
1. Verify that taxes are paid prior to signing approved plats and site plans.
2. Sign final plat map.
3. Maintain records of subdivision maps and files.
SECTION 3 - SUBMISSION REQUIREMENTS

3.1 GENERAL
It is the developer’s responsibility to contact the Planning Department for information and direction relating to subdivision review, site plan review, applications for hearings, required plans and related fees. If an engineer or other representative is designated to complete these responsibilities, the developer must submit a letter to the Town of Penfield authorizing the representative to perform these services. All applications shall include a letter from the owner/developer or their representative, describing the project.

In preparing the site and/or subdivision plans, the developer shall subdivide the project drawings into separate sets of plans (unless otherwise permitted by the Planning Department) as follows:

- Subdivision Plat Record Plan
- Grading and Drainage Plan
- Sedimentation and Erosion Control Plan
- Utility Plan
- Lighting Plan
- Traffic Control Plan
- Landscaping Plan
- Miscellaneous Plans (details, profiles, etc.)

All maps must be prepared by a professional land surveyor and/or a professional engineer licensed by New York State, as permitted by New York State Education Law (Article 145), and shall contain such person's signature, seal and address.

3.2 PLAT PLAN
1. All maps must be prepared upon such medium and be of such size as will be accepted by the Monroe County Clerk for filing.
2. All maps must be prepared to a scale of not more than sixty feet (60’) equal one inch (1”), unless otherwise permitted by the Town Engineer. Where more than one (1) sheet is required to show the entire development, an overall plat map showing all sections shall be provided. The lot numbers shall be consistent with the numbers shown on the preliminary plat maps or shall provide the previous lot numbers on the plat.
3. All maps must show the location and widths of existing and proposed streets, alleys or easements and the location of property lot lines with dimensions and bearings. Also, lots shall be numbered and shall have their area in square feet indicated.
4. All maps shall show the location of all existing buildings and septic systems within the limits of the map, with front, rear, and side setbacks from any lot line with dimensions thereof and all existing buildings outside the limits of the map, within one hundred feet (100’) of any proposed street or any proposed lot line. The driveways, swales, utilities, and other existing features located on the opposite side of the right of way should be shown.
5. All maps shall contain the names of all reputed adjacent owners or subdivisions heretofore filed in Monroe County Clerk's Office, including those on the opposite side of all frontage roads.
6. The map shall contain the title of the proposed subdivision together with the names of the owner or owners.
7. The map shall contain the date, a north arrow, a graphic scale, and a date for all revisions.
8. The map shall contain a notation of the location and elevation of a permanent benchmark referenced to the accepted datum. All plans should be tied into the State Plane Coordinate System, Western Zone using the NAVD 88 and NAD 88 datum.
9. The map shall note the existing zoning of the parcel and all zoning district lines adjacent to the site with all applicable standards for the site’s zoning district.
10. The map shall note all of the granted and requested variances from the Zoning Ordinance along with the date of any decisions.
11. The map shall include the names of existing and proposed streets.
12. The plans shall show all proposed monument locations as noted in these specifications. A minimum of one monument in each phase and on each roadway shall be tied into the approved datum and the State Plane Coordinate System, Western Zone. The map shall note the location of any municipal boundary lines within the subdivision, including zoning districts, fire districts, and school districts.
13. The roadway centerline shall be shown with stationing and geometry.
14. All proposed and existing easements shall be shown with bearings and distances or provide a separate easement map with a description.
15. All gutters, islands, and sidewalks shall be shown.
16. All right of way widths shall be shown.
17. The owner’s names, tax account number, and address of adjoining properties, including those on the opposite side of any road.
18. The maps shall include a certification by a licensed professional engineer and/or a licensed land surveyor as evidence of professional responsibility for the preparation of the Plat Map and a place for the liber and page after it is filed.

3.3 GRADING PLAN
1. The map shall contain the date of preparation and revisions, north arrow and graphic scale.
2. The map shall contain existing and final grade contours at not greater than two feet (2’ intervals. Intervals less than two feet (2’) may be required depending on the character of the topography. A separate grading map will be required by the Town of Penfield where the terrain is such as to make it necessary. Contours shall extend a minimum of one hundred feet (100’) beyond property limits, including along any adjoining roadways.
3. The location and grade of all driveways, culverts, and roadways adjacent to and opposite the property under consideration.
4. The map shall show the existing grades with contours, which must be based on the approved datum. If datum is not possible, the location and grade of the benchmark used should be noted. A permanent benchmark is required on all projects.
5. The location of all adjacent and proposed buildings including finished floor elevations.
6. Approximate location of all adjoining septic system and other underground facilities.
7. Show all lot numbers.
8. The location of all existing and proposed swales, creeks, ponds, drainage outlets, culverts, and other drainage structures with invert grades, including all downstream receiving drainage structures.
9. Location, grading, easements, and control features of the stormwater management facility (SWMF) and Green Infrastructure Practices.
10. The limits of any Environmental Protection Overlay Districts (EPOD) or other regulated area as designated by the Town of Penfield, Monroe County, NYSDEC, Army Corps of Engineers, or the Federal Emergency Management Agency.
11. The finished grade for all proposed structures shall be shown. This shall be the garage floor or the lowest grade elevation next to the house. Basement elevations must be noted for any walk out basements. No walkout basements will be permitted without a grading plan showing adequate grade (2%) away from the house pads.
12. Grading plan shall include a note that all swales shall be graded and seeded after earthwork is completed. These areas to be topsoil and seeded shall be shaded.
13. Location of all test pits and/or geotechnical drilling locations shall be noted on the plans. A copy of the test pit/boring logs shall be provided.

3.4 SEDIMENTATION AND EROSION CONTROL PLAN
1. Location of all sedimentation and erosion control features shall be noted.
2. A legend of all symbols used.
3. A construction schedule of work to be performed, including a schedule for maintenance and restoration work. For larger projects, the phasing of the work tasks must be clearly defined for each phase of construction.
4. Provide outline and state the area of disturbance.
5. The signature of the developer and/or contractor responsible for the work in accordance with the requirements of the SPEDS permit shall be provided on the construction documents.
6. Details for all ESC measures proposed.

3.5 UTILITY PLAN
1. Location and material of any existing or proposed water, sanitary sewers, storm sewers, or other utilities and appurtenances. This shall include all service lines and laterals.
2. Location of all known existing and proposed underground gas, electric, communication lines, or any other utility, including service lines. This shall be confirmed prior to signature of the approved plans.
3. Size, slope, invert grades, and length of existing or proposed sewers (stormwater and/or sanitary) and the size and inverts for all appurtenances for the proposed and existing facilities from the point of connection. The size, material, location, and inverts of all catch basins and yard inlets shall be provided.
4. Date that the plans were prepared, revision dates, north arrow, and scale of plans.
5. Location of concrete gutters, culverts, sidewalks, drainage swales, curbing, control structures, rip rap, Green Infrastructure Practices, and all other features required of the Town of Penfield.
6. The plans shall show the location of the nearest existing hydrant in addition to the hydrant flow test data used for the project design.
7. All plans shall be tied to the State Plane Coordinate System, NY West Zone, using NAD 88 datum.
8. Station and grade of all high and low points in the roadway.
9. Show location of existing and proposed street lights.

3.6 OTHER SHEETS
1. The roadway (public and private) plans shall include the point of tangency (PT), point of curvature (PC), length of tangent, length of radius of curve and all angles or bearings for the proposed roadway and right of way.
2. A detail sheet with all Town of Penfield standard details as provided by these specifications.
3. A detail of any proposed lighting with the information on the fixtures to be used, including manufacturer, wattage, finish, and appearance.
4. A detail of the proposed outlet control structures and control weir(s).
5. Landscaping plans and planting details.
6. Tree preservation details.
7. Sidewalk details.
8. Off-site work plans and details.
10. Traffic control/striping plans.
11. Profiles for all roadways, stormwater sewers, sanitary sewers, and water supply system piping, including location of all proposed or existing crossings as located by the field survey.
12. Other items as directed by Town staff or other review agencies.
3.7 ENGINEER’S REPORT
The applicant’s engineer shall submit a report addressing the following minimum items for consideration by the Town of Penfield and shall include the following:

- Description and design calculations for the stormwater management system and water quality improvements
- Description and design calculations for the water supply and fire protection system;
- Description of erosion control measures and construction schedule.
- Description and design calculations for the sanitary sewer disposal system, including capacity of downstream facilities.
- Description and design calculations for traffic generation from the site and the level of service for adjacent intersections, as required by the Town Engineer or other transportation authority.
- Test pit results for rock and water table determination (at proposed pond, utility trenches and home sites) as directed by Town Engineer.
- Percolation test locations and results, if required.
- Geotechnical report and or a soils report, if required.
- Environmental Assessment (SEQRA), if required.
- Groundwater assessment/monitoring, if required.
- Green Infrastructure Analysis and design
- Post-construction maintenance plan

3.8 EASEMENTS
It is the responsibility of the developer to furnish, in the required town format, all necessary easement documents. Easements may be obtained for such items as storm and sanitary sewers, watermains, sidewalks, dedicated streets, drainage facilities, conservation areas, pedestrian access (trails), and cross access rights.

The developer shall provide a properly written metes and bounds description of each easement to the Director of Planning for review along with a scalable drawing showing the location of all easements with relationship to property lines. These shall be provided to the Planning Department prior to obtaining signatures on the approved drawings.

These documents will be reviewed by the town staff and the Town Attorney for completeness.

In addition, the developer shall provide the town a certified check or cash in an amount to be determined by the Town staff to cover the cost of recording these documents in the County Clerk's Office. All checks shall be made payable to the "Town of Penfield". These documents shall be recorded in the Monroe County Clerk’s Office by the Town of Penfield.

3.9 ROADWAY DEDICATION
All necessary papers for roadway dedication shall be provided by the developer to the Planning Department. These documents shall be in a format approved by the Town’s Attorney and shall include, but not be limited to, the following:

- Roadway deed with attached map showing all roadways to be dedicated.
- Order.
- Consent.
- Town Board Resolution accepting roadway dedication.
- Fees for filing papers at Monroe County Clerk’s Office.
3.10 OTHER
In accordance with local, state, and federal laws, other materials shall be submitted to the Town of Penfield. These shall include, but not limited to,
- State Environmental Quality Review Act Form
- Coastal Assessment Form
- Agricultural Assessment Form
- All correspondence with state and county DOT.
- Architectural renderings, commercial project only (refer to Town of Penfield Architectural Guidelines).

3.11 SIGNATURES
All maps shall include a signature block for the following town officials or their designated representatives having approval authority:
- Town Planner/Director of Development Services (Plat)
- Town Engineer (Plat, Grading, Utility, Roadway, Lighting, Erosion & Sediment Control)
- Town Clerk (Plat)
- Highway Superintendent (Utility, Roadway, if dedicated)
- Fire Marshal (Plat, Utility)
- Town Landscape Consultant (Landscape)
- Chairperson of Planning Board/Town Supervisor (Plat)
- Others, as required by Town Planner
SECTION 4 - SPECIAL DISTRICTS

4.1 GENERAL
For projects that require the establishment or extension of an intensified lighting, sanitary sewer, park, sidewalk, or other special districts, the following items must be completed by the developer and submitted to the Town of Penfield prior to obtaining the signature of the Town Planner:

- A properly written metes and bounds description of each district, as well as the entire parcel;
- A scalable map no larger than 8.5" X 14", showing the proposed district limits and general extents of improvements proposed,
- A petition requesting that the Town Board create or establish the specific district or extension, that is signed all property owners of the proposed district or extension.

Once the Town Board has reviewed the petition and has determined that establishment of said district or extension is appropriate and is in the best interest of the public; the staff will recommend that the Town Board schedule a public hearing, consistent with the requirements of New York State Town Law, to hear any and all public input related to the formation of the district.

4.2 STREET LIGHTING DISTRICTS
The Town of Penfield owns and operates all street and/or roadway lighting within the Town of Penfield. This lighting does not include lighting on private property or in commercial parking lots. The Town accomplishes this lighting effort through two (2) separate types of Street Lighting Districts, the Townwide Street Lighting District and Intensified Street Lighting District(s).

All properties within the Town of Penfield are within and receive benefit from the Townwide Street Lighting District. This district is responsible for the installation, operation & maintenance of street lighting. All property owners pay an annual Townwide Street Lighting tax, on an ad valium basis.

An Intensified Street Lighting District is formed at the request of a private entity such as a developer or a group of residents. This type of street lighting provides for a substantially increased lighting level of street lighting along a residential roadway within a specific neighborhood or area.

Any new development or subdivision being served by either a publically dedicated road, or Private Drive serving 6 or more lots that enters onto a collector road, County or State Highway shall install a street light at that intersection. The cost of installation and connection of this street light shall be borne by the developer. Lighting design criteria is found in Section 15.

The Public Works Department shall determine the layout of all lights and connection points associated with this installation, prepare necessary lighting layouts and make application to RG&E for energy supply. It will be up to the developer to arrange for and fund the installation of said improvements at the direction of the Town.

4.3 INTENSIFIED LIGHTING DISTRICTS
When a developer or neighborhood association/group wishes to have Intensified Street Lighting installed within their development or neighborhood, they must petition the Town Board to create an Intensified Street Lighting District. In both cases the property owner(s) requesting and are benefited by the special district, shall bear the cost of the improvements. The Town Board requires that a minimum of 51% of resident owners and 51% of total assessed value have signed a petition for consideration.
A developer of a new subdivision shall determine prior to Final Site Plan approval if Intensified Street lighting will be utilized within the development. If so the developer shall:

- Petition the Town Board for creation of an Intensified Lighting District
- Notify the Penfield Street Lighting Department in writing
- Prepare a brief report including the following:
  - Number and location of light poles based on light dispersion patterns
  - Number and location of pull boxes
  - Length of underground wire and conduit
  - Number of “RG&E” Connection Points
  - Cost estimate of installation

4.4 RECREATION FACILITY DISTRICT

Open space in a development may be approved by the Planning Board/Town Board under Town Law 277, Town Law 278 (formerly Town Law 281), Incentive Zoning Law, or under the Zoning Ordinance of the Town of Penfield. If the open space is suitable for a public neighborhood park, the recreation facilities should be accepted for dedication by the town upon completion of construction according to the development specifications for recreation facilities.

If the open space is primarily for the common use of the residents of the development, the Planning Board/Town Board must determine at the time of subdivision and site plan approval whether ownership and maintenance are to be the responsibility of a single property owner as in the case of an apartment development, a homeowner's association composed of all property owners in the development or of a special park district as a condition of site plan approval.

Recreation areas in all residential zones are to be set aside as required by the Planning Board/Town Board and described by Zoning Ordinance of the Town of Penfield as applicable and deemed appropriate by the Planning Board.

Specific recreation facilities to be constructed by the developer shall be determined by the Planning Board/Town Board upon recommendation of the Parks and Recreation Advisory Board. The construction of the recreation facilities shall be completed prior to the receipt of a Certificate of Occupancy for any structures in excess of fifty (50) percent of the total homes for that particular section/phase.

All common land set aside for recreational facilities should be easily accessible through common walkways to all residents of the development and to the Town of Penfield for maintenance. An adequate and clear right-of-way will be required for maintenance.

Watercourses and other environmental features where town ownership is in the public interest should be maintained by the town through ownership or easement. Open areas which do not serve a public purpose and which are not suitable for common recreation land should not be set aside as public or common land, but should be added to nearby lots. Conservation easements may be required to prohibit further development of environmentally sensitive areas.

The Town of Penfield reserves the right to determine those parklands to be used for active recreational purposes and those to remain as passive recreational purposes. The developer shall be required to install signs or other demarcation devices to delineate the limits of the parkland from residential lots.
4.5 SIDEWALK DISTRICTS
All new development shall comply with the Town of Penfield Sidewalk Policy, which promotes the installation of sidewalks along major roadways and on all new developments. The policy requires all new development to install sidewalks along the frontage of all existing roads and both sides of new roadways.

When sidewalks are installed in new or existing residential development, an **Intensified Sidewalk District** must be created for the long term replacement and repair of sidewalks. The cost associated with this district is added to the annual property tax bill for each property within this district. The fees are determined annually by the Town Board.

The developer’s engineer is required to submit a map and description of the proposed district to be accepted by the Town Board. This is required prior to final signature on the plans.

4.6 SANITARY SEWER DISTRICT/EXTENSIONS
A permit and/or approval of the Engineering Department are required prior to connecting, repairing or extending any existing sanitary sewers facilities within the Town. This includes any private facilities which are being connected to the Penfield public sewer system.

In the case of extension of sanitary sewer facilities outside of an established sewer district, or extension thereof the entity desiring said extension shall first obtain the approval of the Penfield Town Board through the District Extension process or Out of District User process. This process’ first requires the entity to meet with the Engineering Department to determine:

- If sufficient sewer capacity exists to support said connection
- the most appropriate point and means of connection
- boundaries of the proposed extension
- If an Inter-municipal review and/or approval is required.

The developer/owner must petition the Town Board for a Sanitary Sewer District Extension approval or Out of District User approval. The petition process includes:

- Letter and Petition form to the Town Board seeking to create said extension
- Preparation of a map, plan and report which includes:
  - Sewer system layout, connection and terminus points
  - Properties to be served and meet and bounds description (filable size)
  - Cost estimate of said improvements

Once the Town Board has reviewed the petition and has determined that establishment of said district or extension is appropriate and is in the best interest of the public; the staff will schedule a public hearing, consistent with the requirements of New York State Town Law, to hear any and all public input related to the formation of the district. In the case of Out of District User approval, a Public Hearing is not necessary. The Town Board will approve or deny the district extension or Out of District User matter.

All costs associated with said improvements and district formation shall be borne by the Petitioner.
4.7 SPECIAL IMPROVEMENT DISTRICTS
The Developer shall provide a map and description of any other special improvements that will need future maintenance as part of the Planning Board or Town Board approval process. These items may include, but are not limited to: mowing, subdivision sign maintenance, future tree trimming, herbicides, etc.

4.8 OTHER IMPROVEMENT DISTRICTS
The Developer shall provide a map and description of any other special improvement district that is required by the Planning Department or Town Board including, but not limited to, Private Fire Hydrant District, Intensified Park District.
SECTION 5 – CONSTRUCTION REQUIREMENTS

5.1 GENERAL
Once a project has received approval from the Town of Penfield, the following mandatory steps must be followed in order to proceed to the construction phase:

5.2 IRREVOCABLE LETTER OF CREDIT
The developer of a project must submit one of two permitted forms of financial responsibility to the Town of Penfield to guarantee the proper completion of all infrastructure, grading, erosion control, and landscaping improvements. These must be in the form of an Irrevocable Letter of Credit from a recognized banking institution within the State of New York or an escrow deposit with the Town of Penfield in the form of cash, certified check, or cashier’s check. The value of the letter of credit is determined through a review of the engineer’s estimate. The engineer's estimate shall be reviewed and approved by the Town Engineer in writing to the Supervisor. The developer’s Agreement, in the town’s standard format, and the Irrevocable Letter of Credit are required prior to scheduling of the pre-construction meeting or the start of any work. An Irrevocable Letter of Credit shall be itemized in detail and shall consist of, but not limited to, the following minimum items:

A. Sanitary Sewer System
   (1) Sewer piping (including wye branches)
   (2) Sanitary manholes
   (3) Laterals (including clean outs with metal caps)
   (4) Pump stations
   (5) Connections to Monroe County interceptors
   (6) Connections to existing utilities and appropriate surface restoration
   (7) Televising completed pipes

B. Stormwater Collection System
   (1) Storm sewer piping
   (2) Storm manholes
   (3) Catch basins
   (4) Yard inlets
   (5) End sections
   (6) Road & driveway culverts
   (7) Laterals (including clean outs with metal caps)
   (8) Flushing of storm sewer system (as directed by Town Engineer)
   (9) Cleaning of the Stormwater Management Facility

C. Roadways
   (1) Road excavation and boxout
   (2) Road base (including weep wedge and underdrain pipe)
   (3) Binder pavement
   (4) Top pavement
   (5) Concrete gutters/curbing
   (6) Seeding of R.O.W.
   (7) Shoulder modifications
   (8) Striping
   (9) Utility crossings
   (10) Temporary Turnarounds

D. Grading and Erosion Control
   (1) Sediment basins (installation and maintenance)
   (2) Silt fencing (installation and maintenance)
   (3) Grading of drainage swales
   (4) Stormwater control facility
(5) Outlet Control Structures
(6) Rock excavation/blasting
(7) Re-vegetation of primary swales
(8) Slope protection measures
(9) Lot grading
(10) Tree removal and disposal
(11) Clearing and grubbing
(12) Rolled erosion control fabric
(13) Check Dams
(14) Mulching
(15) Fill material
(16) Maintenance of ESC measures
(17) Green Infrastructure practices
(18) Post construction stormwater facility record map including topo

E. Miscellaneous Items
(1) Sidewalks
(2) Property pins
(3) Street lights
(4) Street signs
(5) Monuments
(6) Record drawings (Including Stormwater Management Facility)
(7) Traffic signal light
(8) Striping
(9) Traffic control signs
(10) Traffic calming measures
(11) Restoration of offsite improvements
(12) Road crossing restoration
(13) EPOD markers
(14) Overlay District and/or drainage fees
(15) Other items as determined by Town staff

F. Landscaping
(1) Plantings
(2) Berms
(3) Mulch
(4) Tree preservation measures
(5) Street trees
(6) Lawn restoration
(7) Landscaped islands/medians
(8) Stormwater control facility plantings

G. Water Distribution System (For Reference purposes only)
(1) Road bore (Town roads only)
(2) Lawn restoration
(3) Driveway restoration
(4) Roadway restoration
(5) Hydrants

H. Recreation Facility
(1) Tennis/ Basketball Court
(2) Tot Lot
(3) Lawn restoration
(4) Trails/Walkways
(5) Benches
(6) Bike racks
I. Special District Fees
   (1) Incentive zoning fees
   (2) Regional study fees (i.e. 441/250, Browncroft-Creek-Blossom, Four Corners, Empire-Creek, Panorama Valley)
   (3) Drainage fees

NOTE: Add 10% Contingency and 3% Inspection fees on items A to H.

The Letter of Credit shall cover all improvements required by the Town of Penfield. Any phasing of the project undertaken by the developer shall be approved by the Town Engineer. All Letters of Credit shall be deemed automatically extended without amendment for one (1) year from the present or any future expiration date.

Attached to the Irrevocable Letter of Credit, and made a part thereof, shall be the town's standard Agreement in the approved format (see "Exhibit A1" or Exhibit A2").
IRREVOCABLE LETTER OF CREDIT

No. __________________________

Dated:________________________

Town of Penfield
3100 Atlantic Avenue
Penfield, New York 14526

Gentlemen:

We hereby open our irrevocable credit in your favor, available by your drafts at sight, and drawn on us for a sum not to exceed __________________________ ($___________________) for the account of __________________________(Developer), to be accepted by your signed statement, that drawing is due to the default or failure to perform by the Developer the following improvements on or before __________________________.

Acting through the Town of Penfield's Engineer, you will notify us when either:

1. The improvements have been timely and satisfactorily completed and the credit may be released, or

2. The Developer has failed to perform or is in default.

All drafts drawn under this Irrevocable Letter of Credit must be marked, “Drawn under __________________________ Bank, Irrevocable Letter of Credit Number __________________________, dated __________________________.

We hereby agree with the drawers, endorsers and bona fide holders of drafts under and in compliance with the terms of this credit, that the same shall be duly honored if presented on or before __________________________.

This Irrevocable Letter of Credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision), International Chamber of Commerce, Brochure No. 400.

Sincerely,

Duly Authorized Officer
DEVELOPER’S AGREEMENT FOR LETTER OF CREDIT

This AGREEMENT, made this _____ day of _____________, _____ by and between the TOWN OF PENFIELD, with its municipal offices located at 3100 Atlantic Avenue, Penfield, New York (hereinafter referred to as the "Town") and __________________________ with offices located at __________________________ (hereinafter referred to as the "Developer");

W I T N E S S E T H:

WHEREAS, the Town has the obligation to provide for the orderly and proper development and use of land within the Town, including the planning, engineering, development and construction of facilities, such as, but not limited to, roads and roadways, sidewalks, water systems, sanitary systems, and storm drainage systems; and

WHEREAS, the Developer has made application to the Town for the construction and development of __________________________ as more fully set forth in the approved site plan dated________________________ for said project, which is incorporated herein by reference.

WHEREAS, the Engineer's Estimate or other breakdown of costs for said project is annexed hereto and made a part hereof and marked Exhibit "A"; and

WHEREAS, the Town has approved the project proposed by the Developer with certain conditions and requirements, which conditions and requirements are set forth in and made a part of the various approvals and permits which have been issued by the Town;

NOW, THEREFORE, the parties hereto agree as follows:

1. The Developer agrees to supply all of the work, labor and services and to supply all of the materials necessary to complete the work described in Exhibit "A" attached hereto, all in conformity with the approvals previously granted by the Town and according to applicable standards and specifications adopted by the Town or by other governmental authorities having jurisdiction.

2. In order to provide the Town with security for the faithful performance of this Agreement by the Developer, the Developer hereby submits a letter of credit, certified check, money order, or cash for the completion of items as required by the Town in an amount of $_. All Letters of Credit shall have an automatic renewal for a one year period.

3. All work shall be completed on or before ______________. Any delay in the completion of the work shall be requested in writing to the Town.

4. In the event the Developer fails to satisfactorily perform the work described in Exhibit "A", in accordance with the approvals and permits previously granted by the Town, the Town shall give written notice of such failure to the Developer, by mailing a Notice of Deficiency to the address of the Developer as shown in this Agreement. Such notice shall specify the item or items of work which have not been properly completed, and
with respect to each item, shall indicate the nature of the deficiency. The Developer shall have a reasonable time, but not less than fifteen (15) days, as determined by the Town Engineer, to cure the deficiency identified in such Notice.

5. Upon any failure of the Developer to complete the work within the time scheduled by the terms of this Agreement, or by the terms of any extension of time granted by the Town to the Developer, and/or upon the Developer's failure to correct and/or perform any work concerning which the Town has sent a Notice of Deficiency to the Developer in accordance with the provisions of Paragraph 4 of this Agreement, the Town shall have the right to use the funds deposited with the Town to complete the work. The Town shall draw such funds in an amount which shall, in the Town's sole and absolute judgment, be sufficient to pay the cost of the completion of the required work. The Town shall pay for materials, equipment, labor, and services necessary to complete the work out of said account. The Developer shall remain liable to the Town for any deficiencies.

6. The Developer shall hold the Town harmless for any action undertaken by the Town on behalf of the Developer.

7. This Agreement shall expire and terminate upon the Town Engineer's certification of final completion of the work set forth in Exhibit "A". Upon the Town Engineer's certification of final completion of the work, the Town shall release to the Developer all funds which remain on deposit with the Town under this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused their corporate seals to be hereunto affixed, and this Agreement to be signed by the duly authorized officers this day of , .

TOWN OF PENFIELD:

________________________________________

Town Supervisor

DEVELOPER:

________________________________________

STATE OF NEW YORK )
COUNTY OF MONROE )

On this day of , , before me personally came , to me personally known, who, being duly sworn, did depose and say that he/she resides in the Town of Penfield, New York, that he/she is the Supervisor of the Town of Penfield, the municipal corporation described in and which executed the above instrument, that he/she knows the seal of said municipal corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Town Board of said municipal corporation, and that he/she signed his/her name thereto by like order.
5.3 TOWN INSPECTION FEES
The Town of Penfield requires all letters of credit include a 3% inspection fee on all improvements included in the letter of credit. The Town of Penfield will hold this money in the letter of credit until all inspection fees, plus any other overtime, facility fees, and/or special charges have been paid in full by the developer. Failure to pay inspection fees may result in the delay of the town to issue a building permit.

Inspection fees are non-refundable and shall cover labor and incidental costs for all administrative and inspection expenses by the Town of Penfield including, but not limited to, site inspections, review of change orders, review of engineer’s inspection reports, processing payments from the letter of credit, and camera inspections of sewers. This fee is established by the Town Board on an annual basis as a fixed percentage of the established Letter of Credit.

All inspections must be completed by the town or their representative. Inspections shall include a review of all utilities, roadways, landscaping, and other site elements to ensure compliance with the approved site plan and these Design Criteria. Testing of storm and sanitary main sewers and/or manholes require full time town inspection. Video inspection of new sanitary and storm sewers shall be done at the direction of the Superintendent of Sanitary Sewers.

Concrete and stone tickets shall be provided to the town’s inspector. All mains, manholes and catch basins shall be cleaned to the satisfaction of the inspector prior to final acceptance. During the placement of road materials, full time inspection is required by the Engineering Department. Compaction tests for all fill within the road box are required. Copies of test results must be submitted to the Town of Penfield.
THE DEVELOPER SHALL BE RESPONSIBLE FOR NOTIFYING THE TOWN AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO THE START OF CONSTRUCTION FOR ANY DEDICATED FACILITIES. IN THE EVENT A CONTRACTOR DISCONTINUES CONSTRUCTION FOR ANY PERIOD OF TIME, THE DEVELOPER SHALL BE RESPONSIBLE FOR NOTIFYING THE TOWN AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO THE RESTART OF CONSTRUCTION.

Any work done without appropriate inspection will not be accepted. Line and grade of all utilities and facilities are to be maintained in accordance with approved plans and shall be the responsibility of the developer and his licensed professional engineer/land surveyor.

Normal working hours for town hall inspectors are 9:00 AM to 5:00 PM, Monday through Friday, except for legal town holidays. Inspection hours for DPW staff members are from 7:30 AM to 3:00 PM, Monday Through Friday. The Town of Penfield DOES NOT offer inspections outside of these identified hours and days. It shall be the developer’s responsibility to coordinate inspections and the town staff’s availability with their contractor. A minimum of twenty-four (24) hours’ notice is required for all inspections.

The town's inspector is not required to sign in with the developer or contractor. Town staff shall carry identification cards at all times.

Building inspections are the responsibility of the Building & Zoning Department, which shall provide the necessary field inspections to insure compliance with the required applicable building codes. Scheduling these inspections with the Building/Zoning Department is the responsibility of the Contractor and Developers. Any re-inspection necessary by the Building & Zoning Department shall result in additional charges billed to the person making an application for the building permit. Any outstanding charges shall be collected prior to the issuance of a Certificate of Occupancy. The inspection of recreation facilities will be the responsibility of the Director of Recreation, the Public Works Department, or their designated representatives. These inspection costs are not included in the inspection costs associated with the Letter of Credit.

Any inspector may issue a Stop Work order when the developer or his contractor has no competent foreman in charge of the work, the work or material does not meet these specifications, or when circumstances are such that continuance of that particular phase of the work would not be in the best interest of the town.

Failure of the town staff, their agents, employees or representatives, to reject improper work or inferior material during construction shall not be construed as, nor implied as, final acceptance. If subsequent inspection or circumstances cause defects to become evident, the developer shall make, or cause to make such cuts or other means to expose the work to determine cause of such defects. Such defects shall then be corrected to the satisfaction of the town at the expense of the developer.

Prior to any request for inspection of any items such as sewers, manholes, catch basins, gutters, sidewalks, or pavement, the developer/contractor shall clean, sweep, flush, broom or otherwise clear the work to permit visual inspection of such item.
5.4 PERMITS
The developer shall obtain from the proper authorities all necessary permits from the Town of Penfield for building, blasting, storage of on-site fuels, and construction work within the Town of Penfield. A copy of all permits from all other agencies shall be submitted to the Engineering Department.

Any work on private property shall that is not part of the development shall be accompanied by a letter of permission or release from the affected property owner(s).

5.5 PRE-CONSTRUCTION MEETING
Once the plans have been signed by town officials and all other regulatory agencies and a letter of credit has been established, the Engineering Department shall be contacted to schedule a pre-construction meeting prior to starting any work on the project. The developer, or his engineer, is responsible for contacting all applicable utility companies and involved agencies once a meeting date has been determined. The developer, contractor, subcontractors, design engineer, and the firm responsible for stake-out and inspection of erosion control measures shall be in attendance at the pre-construction meeting. The developer shall provide the Town of Penfield with the following prior to the pre-construction meeting:

- A minimum of four (4) sets of project plans with all approval signatures
- Irrevocable Letter of Credit and a signed Agreement
- One (1) set of reduced construction drawing (11" X 17")
- Copies of all required insurance certificates; comprehensive and liability (minimum one (1) million and three (3) million respectively)
- Submission of all required easements and descriptions
- Copies of all permits from regulatory agencies (NYSDOT, MCDOT, NYSDEC, etc.)
- Copy of a signed Notice of Intent (NOI) and the SWPPP
- Assessor’s determination of tax parcel numbers and street addresses.

The town may be represented by one or more town officials or their representatives, depending upon the complexity of the project and the improvements to be constructed.

This meeting will cover specific details of the project, including, but not limited to the timetables for the development, special conditions, permit requirements, Town Policy, release of funds, erosion control measures, and all other topics of interest to this development.

Any questions or problems that may arise during construction should be referred directly to the Engineering Department.

The contractor and/or developer shall obtain and have prior to the pre-construction meeting, a current Town of Penfield "Development Design and Construction Specifications".

5.6 SHOP DRAWINGS/INVOICES
Shop drawings and invoices of materials shall be submitted to the Engineering Department prior to any releases of payment for that item. These shall be defined at the pre-construction meeting. No materials shall be installed without Town approval. These shall include, but not limited to, all landscaping materials, concrete mixes, delivery tickets, test results, asphalt, topsoil, or other items as noted during the pre-construction meeting.
5.7 PERMITTED HOURS OF WORK
All site work, including but not limited to, earth movement, grading, installation of utilities, paving and exterior construction of any structure in the Town of Penfield shall be permitted only during the hours of 7:00 AM and 7:00 PM, Monday through Friday and on Saturday between the hours of 8:00 AM and 4:00 PM. No construction activity of any type is permitted on Sundays or the following legal holidays as observed by the Town of Penfield, unless permission is granted by the Town Board.

- New Years Day
- Memorial Day
- Fourth of July
- Labor Day
- Thanksgiving Day
- Christmas Day
- Other holidays observed by the Town shall follow normal work day limitations and any inspection services will be billed at 1.5 the normal hourly rate of the employee.

No vehicles or equipment shall be started or operated prior to or after the permitted hours of work.
The aforesaid requirements of this section (section 5.7) shall not apply to improvements or maintenance of an existing single-family residence or on the property of such existing residence, provided that such work is being performed by the actual owner/occupant of such property and further provided that such work complies with any/all other applicable requirements, including, but not limited to the noise ordinance of the Town of Penfield.

5.8 SURVEY STAKE-OUT
All construction work shall be properly staked-out by competent engineering/land surveying personnel in accordance with the approved plan. Such stake-out shall be in sufficient detail to insure correct elevations of tops of structures, proper inverts, slopes and alignments and utility lateral locations for each lot. Where the pavement base courses or sub-grades are left unfinished during the winter, they will be re-staked in the spring and re-graded accordingly. All adjoining property lines and/or work restriction areas shall be properly staked prior to any earthwork or tree removal. Stake-out shall include delineation of property boundaries.

5.9 RELEASE OF FUNDS FROM A LETTER OF CREDIT
At such times as the developer wishes to have funds released to cover the value of installed improvements, the developer’s engineer shall prepare an estimate of the work installed and submit the estimate to the Town Engineer. The estimate shall be in the same format and itemized breakdown as the engineer’s estimate. A certification shall be signed on the Release of Funds form by either the developer or his licensed professional engineer. The Town of Penfield reserves the right to reject or revise the request for release of funds if all items are not completed to the satisfaction of the Town staff.

The ten percent (10%) retainage on all releases and the ten percent (10%) contingency for each item shall be held intact until all approved improvements have been constructed, inspected, and approved. This shall include, but is not limited to, the following:

- Completion of a camera inspection of sanitary lines.
- All Punch List items have been completed and approved.
- All inspection fees have been paid.
- Receipt of a two (2) year maintenance bond for roadways, landscaping, and utilities
(storm and sanitary) in the amount of at least ten percent (10%) of the approved engineer's estimate for that item.

- Receipt of all testing reports.
- All erosion control measures have been installed, are in good condition, and the site has been stabilized.
- All storm and sanitary sewer mains have been flushed and cleared of any mud or debris. Recreation facilities, pond areas, open drainage ways and other drainage areas have all structures constructed, inspected and approved.
- Sedimentation has been removed from ponds, drainage ditches, and catch basins.
- All disturbed areas have been seeded and a reasonable stand of growth has been established.
- All lands to be dedicated to the town have been cleared, graded, and seeded as directed by the town representative responsible for maintenance of said lands.
- Record drawings have been submitted, reviewed, and approved by the Town.
- All inspection reports have been received.
- Digital copies of all drawings have been submitted to the Engineering Department (Autocad format).
- N.O.T. formwork has been completed where applicable

The Town of Penfield reserves the right to withhold additional funds, as needed, to insure the completion of all incomplete work.

The minimum review time for processing the request for release of funds shall be ten (10) working days. Approved release of funds is administratively processed to the Supervisor of the Town of Penfield for approval. Thereafter, the Supervisor notifies the bank in writing that an approved amount may be released from the developer's Irrevocable Letter of Credit to the developer.

NOTE: The town's financial responsibility is to the developer and not the contractor.

Escalating costs are not sufficient reasons to request the release of either the ten percent (10%) contingency or the ten percent (10%) retainage item prior to final acceptance.

In the event that monies were provided through a certified check in lieu of a bank Irrevocable Letter of Credit, this money will be refunded to the developer only after a properly executed town voucher has been prepared, at which time it will be reviewed and paid at the next available date for check issuance through the Finance Office.

At the completion of the final phase of a development, the developer shall be responsible for cleaning of sediment and undesirable plant growth from stormwater management facilities, flushing all storm sewers, sanitary sewers, catch basins, yard inlets, filling of sedimentation basins, removal of debris, repair of damages, and other needed work prior to final release of funds.
5.10 CHANGE ORDER PROCEDURE
When a significant departure from the approved plans and specifications in any
development project in the Town of Penfield is necessary, such departures must be
authorized via a CHANGE ORDER.

A request for a change shall be initiated by the developer's engineer in writing, including all
necessary drawings, calculations, and easements. This request shall be submitted to the
Town Engineer who will transmit the request to all appropriate town departments.

No significant changes shall be authorized in the absence of a written approval from the Town
Engineer or, where necessary, the approval board. The Change Order must be signed by the
Town Engineer prior to the work being completed. Town Engineer reserves the right to review
all changes with the Town Board or the Planning Board.

5.11 CLEARING AND GRUBBING
During construction of the project, the Town representative may order the clearing of any
trees within the limits of clearing shown on the plans. The Contractor shall carefully prune
branches of trees which have been broken or injured during construction.

All wood, including grubbed stumps, shall be removed from the site or otherwise disposed of,
per written approval of the Town representative. No on-site burning of debris is permitted. Any
on-site burial shall follow the rules for non-compliant fill.

5.12 SITE OPERATIONS AND RELATED WORK
The developer shall generally maintain his tract in a neat and nuisance-free condition.
Excavations and trenches shall not be left open for prolonged periods or be allowed to fill with
water and thereby create a hazard. All builders will be required to install a fifteen (15') foot
wide temporary driveway pad from the garage to the street, following backfill of the basement.
If this requirement is not met, the authorized town official may place a Stop Work Order on the
structure in violation, not conduct any further inspections or both, until the violation has been
brought into compliance.

Developers and/or builders will be responsible for keeping the subdivision streets generally
free of mud or dust and the ROW free of construction material or debris. If the subdivision is
found out of compliance to this regulation, the Authorized Official may place a Stop Work Order on the
portion of the project found to be in violation, not conduct any further inspections or both, until the violation is brought into compliance.

Vacant, unsold lots shall not be used as a depository for scrap lumber or trash and shall be
rough graded to provide positive drainage with vegetation coverage to prevent dust/erosion.
The developer is responsible for the maintenance of unsold lots.

Developer is responsible for the restoration of any damage by any contractor working on the
project site.

5.13 MUD AND DUST CONTROL
The developer shall take all necessary measures to control mud and dust resulting from his
operations and to prevent tracking or spilling of excavated materials onto public roads or
discharged into storm sewers and receiving waters. When directed by the Town
representative, the developer shall apply calcium chloride and/or water where directed in such
quantities and at such frequencies as may be required to control such dust and prevent it from
becoming a nuisance to the surrounding area. Soil storage areas should be located to avoid disturbances to adjoining properties or roadways and shall be seeded with a fast growing seed mix to prevent erosion. Should a contractor fail to comply with these requirements, the town may issue a stop work order and/or require adjoining structures to be washed.

5.14 FILL
All fill within the right of way and within the building envelope (defined as the area bounded by the building footprint) shall meet the following requirements:

- Hard clumps of earth of 6” in greatest dimension shall be broken up before compacting the material in fill, except when the fill material originated from the project contains large rocks, boulders, or hard lumps over 12” in greatest dimension, such material may be incorporated in the fill.
- Fills shall not be installed when material is frozen or a blanket of snow prevents proper compaction.
- Areas of which fill is to be placed shall be cleared and grubbed. The areas shall then be scarified to provide a bond between the existing ground and the fill material.
- No fill shall be placed over existing utilities or services.
- Fill material may consist of inorganic soil, blasted or broken rock and similar materials of man made (i.e. recycled) origin, including mixtures thereof.
- The Developer is required to manage the delivery of fill material and verify that the material meets the Town specifications.
- Fill material that is to be utilized for slope stabilization in excess of 1 (H): 2 (V) shall be tested and approved by a geotechnical engineer.
- Fill placement shall be in conformance with the Article 5-2 (C) of the Zoning Ordinance.
- All excess and non-compliant fill, debris, and waste construction materials shall be removed from the site or disposed of in an approved landfill. Any on-site disposal of non-compliant fill shall be approved by the Town Engineer and the limits shall be noted on the Record Drawings.
- The Town of Penfield shall require testing of any fill material that is suspected of containing hazardous waste or pollutants.

5.15 TOPSOIL SCREENING AND SALES
Topsoil sale operations must be approved by the Engineering Department in accordance with Section 250-9.1 of the Zoning Ordinance, and shall be located to minimize disturbance to adjoining properties. The developer/contractor shall submit a site plan showing the screening equipment location along with a plan to reduce dust and erosion. The developer's engineer shall submit proof that sufficient topsoil shall be retained to provide a minimum of 4”. A letter of credit is required to cover all restoration and clean-up costs.

5.16 MAINTENANCE OF INCOMPLETE WORK
Developers should be aware that non-dedicated streets will not be maintained by the town. The property owners of the lands containing such non-dedicated streets are required to establish associations or enlist other designated persons who shall be responsible for
maintenance, snow plowing and general upkeep.

During the construction and development of the subdivision, the developer or other designated persons must provide plowing and maintenance services until official temporary or final dedication occurs. The Town of Penfield shall not maintain any roadway until final dedication documents have been prepared and filed.

Where work is left incomplete or has not received final dedication from the Town of Penfield, the contractor is responsible for the maintenance and protection of these improvements. All trenches and underground structures that are left open overnight or when work has been suspended shall be barricaded to prevent accidental access.

All sanitary and storm laterals shall be properly marked and protected from damage.

5.17 SAFEGUARDING PERSONS, UTILITIES & PROPERTY

It is the responsibility of the developer and/or contractor(s) to comply with appropriate provisions of the following statutes or laws pursuant to location and safeguarding existing utilities, persons and property:

- Occupational Safety and Health Act and any / all revisions or amendments thereto
- OSHA –Confined Entry
- Town of Penfield Confined Entry Safety Standards

Under provisions of NYS Code Rule - Part 753 – Subpart 3-a it is the responsibility of all persons or entities that plan to excavate to:

1. Before commencing or engaging in any non-emergency excavation or demolition, each excavator shall provide notice of the location and date of the planned excavation or demolition to the one-call notification system serving the vicinity in which the excavation or demolition is to take place. In our area of the State this would be Dig Safely New York (1-800-962-7962)
2. Such notice shall be served at least three but not more than ten working days, not including the date of the call, before the commencement date of the excavation or demolition.

Note: Other responsibilities of an Excavator are listed under NYS Code Rule 753 – Subpart 3

Care shall be taken to protect persons and property, as well as avoid potentially hazardous conditions or nuisances. Excavations left open or unattended shall be properly and completely barricaded with appropriate fencing or other means held out as standard throughout the construction industry. Open excavations within the Right of Way of any public roadway or within 10 feet of any sidewalk shall be covered with a steel road plate.

Closure of any sidewalks or roadways shall be properly marked, barricaded or otherwise delineated. Notification of such closures or re-routing of vehicular or pedestrian traffic patterns shall be given to the Town of Penfield 24 hours in advance of such closure or re-routing.
5.18 COMPLETION OF WORK AND CLEAN UP
Prior to acceptance of the utilities by the town, the developer shall fully complete the work and leave the site in a neat and orderly condition. Slopes, drainage ways and other graded areas shall be fully stabilized by planting grass or other vegetation or by such means acceptable to the town.

Grading between adjacent lots and the street area shall have continuity without abrupt changes in elevation or unfinished ground surface.

All lot areas shall be graded so that surface water will run off uniformly without causing erosion and without accumulation in low areas. To this extent, lots shall normally be graded to drain surface water from the front to street gutters and to the rear towards common grass lined swales which convey run-off to the appropriate receiving structure. Site grading shall not create a nuisance problem to adjoining or downstream properties.

Valve boxes, cleanouts, manhole covers and curb shut-off boxes shall be left at a proper grade and shall not protrude from existing grades or cause harm to persons or equipment.

All utilities shall be buried a minimum of two feet (2') below finished grade.

5.19 WARRANTY OF WORK AND MATERIAL
The developer shall warrantee all work performed and materials furnished against defect, failure, inadequacy, deterioration, blight, or breakage for a period of two (2) years from the date of final acceptance of the work by the Town Engineer. Security in the form of a maintenance bond or cash shall be provided to the town upon acceptance.

The amount of the security shall be a minimum of ten percent (10%) of the actual construction cost or not less than $300.00 (three hundred dollars), whichever is greater.

Developer shall make all necessary repairs or replacements within two (2) days after receipt of written notice from the Town Engineer.

The maintenance bond shall include sewer (sanitary and storm), roadways, and landscaping.

Should the developer fail, neglect or refuse to so comply with the written notice within the specified time, the town shall contact the bonding company (if a bond is established) or complete the repairs and deduct the cost from the security.

5.20 ACCEPTANCE OF DEDICATED FACILITIES
The Developer shall be responsible for all improvements and properties to be dedicated to the Town of Penfield until such time as the Town Board formally accepts said lands by Town Board resolution, including parkland, recreational facilities, roadways, storm water control facilities, trails, open space, street lights, sidewalks or other lands/improvements deemed necessary by the Town of Penfield.

Prior to the acceptance of any land to be dedicated to the Town of Penfield, all improvements and land shall be inspected by town staff after all approved facilities have been installed and vegetation has been restored. The Town of Penfield reserves the right to withhold a final inspection and approval until the last phase of the project has been completed. All accepted improvements/facilities must be determined to be in good condition and in compliance with the approval resolution. All stormwater control facilities shall be
cleaned of siltation or other debris prior to final dedication, including all repairs as required by
the Town of Penfield.

The developer shall install concrete monuments at all angle points and property corners
along lands to be dedicated to or preserved by the Town of Penfield, prior to acceptance of
said land. Permanent markers, posts, or other visible delineation measures shall include the
Town of Penfield seal and contact information.

The developer shall be responsible for all current taxes due on properties to be dedicated to
the Town. Certificates from the Penfield Receiver of Taxes and the Monroe County Treasurer
shall be obtained by the developer and submitted with the offer of dedication of lands to the
town. The Developer must request in writing, to the Town Board, the dedication of said
lands. Upon acceptance by the town, the funds retained in the developer's Irrevocable Letter
of Credit/cash deposit shall be returned.

5.21 RECORD DRAWINGS
Prior to issuance of final release of funds for dedicated utilities, the developer's engineer shall
prepare and submit a Record Drawing. The Record Drawing shall be drawn in the same
scale as the approved Utility Plan and shall accurately locate and tie the following utilities and
appurtenances to approved datum and the NY State Plane Coordinate System:

- Storm and sanitary manholes, rim and invert elevations and actual length and
  slope of the sewer;
- Storm and sanitary wye branches stationed in an upstream fashion along the
  center of the respective utility;
- Manholes stationed in an upstream fashion from receiving point of structure;
- Storm and sanitary clean out located by centerline station and right angle offset;
- End section and field inlet locations and inverts;
- Detention facility limits and grades including verification of design capacity;
- Detention pond inverts for inlet and outlet structures;
- Hydrants and valve locations;
- Curb stop locations;
- Monument locations and reference ties.
- Street lighting facilities including underground conduit, pull boxes, etc.

The final record drawings of all site plans, utility, and grading shall be submitted in the form of
one (1) reproducible mylar, along with a digital copy in .dwg format.

5.22 BLASTING PROCEDURE
It is the intent of this procedure to provide a set of guidelines and minimum requirements for
licensed and certified contractors to follow when it has been determined that blasting must be
used for rock removal at certain construction sites within the Town of Penfield.

General
Except as stated hereinafter, the method of rock removal shall be at the contractor's option.
The contractor shall make his own independent investigation and assessment of the quantity
of rock to be removed and the difficulties and hazards attendant thereto. The contractor shall
provide all equipment, materials and labor necessary to fracture and loosen rock for
subsequent removal. Also, the contractor shall bear all responsibility for blasting operations
and shall save harmless the Town of Penfield from any and all claims for real or alleged
damages resulting from his operations.
Blasting shall be done only by licensed/certified contractors who shall have at least five (5) years of past experience in rock blasting. The contractor, site superintendent or foreman shall be currently licensed for blasting work in New York State and related work done only by qualified employees of the contractor. The licensed blaster shall be present at all times, have his license on the work site, and shall permit examination thereof by officials having jurisdiction.

Explosives shall be stored in magazines suitable to the Town of Penfield Fire Marshal. Storage of explosives at individual work sites is not allowed except for that amount of explosives required for a day’s work and where the contractor has demonstrated that such storage shall be in conformance with local and state regulations, as well as any further requirements of the Fire Marshal. Any explosives not used in the day’s work shall be removed from the individual work site overnight and returned to the supplier. In no case shall the Contractor store explosives at unattended sites.

There shall be no overnight storage of explosives in the Town of Penfield.

The contractor shall observe all municipal ordinances, State and Federal laws relating to transport, storage handling and use of explosives as provided in the Labor Law of the State of New York and in the Industrial Code Rules promulgated there under by the Board of Standards and Appeals of the NYS Department of Labor relating to the types of work to be performed and the NYS Fire Prevention Code with all amendments and all other laws, regulations, ordinances, etc., as may apply. The requirements of OSHA shall also be considered as part of these specifications along with NFPA Explosive Materials Code, Vol. 7, Section 495, 1992.

The contractor shall be solely responsible for the consequences of his drilling and blasting operations. He shall conduct such operations in a manner so as not to endanger life or property.

Blasting shall be done only with such quantity and strengths of explosives in such manner to break the rock approximately to the intended lines and grades, but will leave the rock not to be excavated in an unshattered condition. Care shall be taken to avoid excessive cracking of rock upon or against which any structure will be built and to prevent injury to existing pipes or other structures and property above or below ground.

**Use of Explosives:**
Prior to any blasting, a permit must be obtained from the Town of Penfield Fire Marshal or the designated representative.

Blasting is to be performed only during the hours of 9:00 AM to 4:00 PM on approved work days.

Blasting is to be done only by licensed/certified contractors. Charges shall be of such power, spacing and timing so that the blasts will not make the excavation unduly large, shatter adjoining rock, damage or endanger adjacent utilities or other structures. The contractor shall be fully liable for all damages or nuisance caused by his blasting operations and shall promptly repair all damages at his own expense.

All unauthorized persons shall be prevented from entering the immediate area where blasting operations are being conducted.
Charges shall be placed by drilling them through existing soil overburden. The contractor shall decide if blasting mats are necessary over the top of existing soil along the blast route. These mats shall be provided by the contractor who shall have sole responsibility regarding the proper use and placement of such.

The contractor shall give notice of his intent to detonate charges at least twenty-four (24) hours in advance to the Town Engineer, the Town Fire Marshal and owners of all utilities within two hundred (200') feet of the work site. The contractor shall signal his intention to detonate charges with the use of a whistle or siren clearly audible from a distance of seven hundred (700') feet from the point of detonation. The signal shall be given both five (5) minutes and one (1) minute prior to detonation. An “all clear” signal shall also be given.

Precaution shall be taken to prevent accidental discharge of electrical blasting caps/detonators from current induced by radio or radio transmitters, lightning, adjacent power lines, dust storms or other sources of extraneous electricity. Safety precautions shall include the following:

1. The suspension of all blasting operations and removal of all persons from the blasting area during the approach and progress of an electrical storm.
2. The posting of signs warning against the use of mobile radio transmitters on all roads within three hundred fifty (350') feet of blasting operations. Said signs shall be located at least three hundred fifty (350') feet part.
3. Blasts within two hundred (250') feet of any structure or where blasts are less than a scale distance of fifty (50) in vibration shall be monitored by a seismograph. Peak air pressures shall not exceed one hundred and forty (140) Db on any structure in the influence range of the blast site.
4. The observed results of a monitored detonation shall be provided to the Fire Marshal. The contractor shall immediately examine the results and, in the event that any detonation results in vibrations or pressure levels exceeding the allowable limits, he shall modify the blasting techniques used for subsequent detonations so as to achieve the specified results.
5. All work shall be coordinated with and locations/limits of such work determined by the Fire Marshal.
6. Extreme care shall be taken to protect underground utilities. The contractor shall have at his disposal the blaster's logbook, which shall be made available to the Fire Marshal upon request.

The contractor shall have at his disposal the blaster's Logbook which shall be made available to the Fire Marshal or his designated representative at all times per request.

All blasting complaints received by the developer/contractor shall be reported to the Fire Marshal within twenty-four (24) hours of receipt thereof. Such reports shall include the name, address, date, time received, date and time of blast complained about and a brief description of the alleged damages or other circumstances upon which the complaint is predicated. Each complaint shall be assigned a separate number, and all complaints shall be numbered consecutively in the order of receipt. In the event that more than one (1) complaint is received from the same complainant, such later complaint shall show all previous complaint numbers registered by the same complainant. When a settlement of a claim is made, notification shall be made to the Fire Marshal. The Fire Marshal shall be notified immediately, throughout the statutory period of liability, of any formal claims or demands made by attorneys on behalf of claimants, of the serving of any notice, summons, subpoena, or other legal documents.
The contractor shall immediately be notified of any investigations, hearings or orders received from any governmental agency, board or body claiming to have authority to regulate blasting operations.

Prior to the start of construction in any area, the contractor shall conduct pre-construction inspections. These inspections shall be done initially and later repeated as follows:

Pre-construction inspections shall be made by a qualified specialist approved by the owner retained for this purpose by the contractor to observe the conditions of existing structures and facilities in the vicinity of the work at required intervals. The inspections shall include all structures and facilities located entirely or partially within a scale distance of fifty (50') feet from the blast site. The pre-construction inspections shall obtain diagrams of all walls, partitions, floors and ceilings showing existing cracks; elevation photographs of exterior cracks or damage and any other such data as is applicable to locate and define the amount and extent of existing damage. All existing structural deficiencies, major or minor, shall be shown.

The contractor shall prepare and deliver to the Fire Marshal a copy of the pre-construction inspection upon request.

The preceding requirements shall apply for all excavations utilizing blasting. The contractor shall conduct the pre-construction inspection at work sites as detailed in the preceding subparagraph.

Nothing contained herein shall relieve the contractor of responsibility for claims arising from his construction operations. Failure to inspect any structure, whether or not required by these requirements, or inadequacy of the inspections, shall not relieve the contractor of his responsibility.

5.23 REQUIREMENTS TO OBTAIN A BUILDING PERMIT
Before the first Building Permit is issued for any approved project, the following site and utility work shall be completed and accepted by the Authorized Official:

A. Compliance with the Town Board, Planning Board, and/or Zoning Board of Appeals approval resolution.
B. Subdivision Plat Map filed in Monroe County Clerk’s Office and sufficient evidence provided.
C. Completion of Certificate of Substantial Completion form to the Building Department from the Engineering Department.
D. Earthwork completed to the point so as to provide required building pads, adequate site drainage features including, but not limited to, installation of storm piping, swales, or other stormwater collection systems as specified on the approved site grading plan.
E. All primary swales and rights of way shall be seeded.
F. All erosion control measures, including a stone construction entrance, siltation barriers, sedimentation basins, and silt traps, either shown on the approved plans or deemed necessary by the town, are properly installed and maintained.
G. Trees, brush, and stumps shall be removed from the site, unless otherwise
H. Installation of a road meeting the town specifications, consisting of a stone base and binder. Said road shall be continuously maintained as required by the Building Inspector and/or Fire Marshal.

I. Installation of street signs, with street names as approved by 911 emergency services and the Town Fire Marshal.

J. Topsoil stockpiles shall be properly protected from erosion.

K. Storm and sanitary sewer mains, manholes, catch basins, yard inlets and laterals shall be installed, tested, and approved. Laterals shall be installed to the cleanouts and properly marked.

L. Watermains and services have been installed, tested, and accepted. A fully charged hydrant shall be available within 250’ of the building site.

M. The developer shall not be permitted to construct a foundation for any structure until such time as it can be demonstrated that the work is within the approved setbacks and grade. A footing elevation certificate shall be provided prior to the required inspection of the footer by the Building Inspector.

5.24 REQUIREMENTS TO OBTAIN A CERTIFICATE OF OCCUPANCY

The building or structure shall have passed all inspections required by the Building Inspector, Fire Marshal, Sewer Department, New York State Board of Fire Underwriters, Monroe County Health Department and/or any other agencies having jurisdiction, including, but not limited to the following:

A. Driveway culverts properly installed.

B. Driveway base properly installed and graded so as to provide a uniform well-drained driving surface of adequate base to support H-20 loading. All driveways shall be paved, at a minimum, from the edge of pavement of the public roadway to the edge of the right-of-way line. The pavement shall consist of a minimum of 2” of #1 Dense Binder with appropriate radii and compaction.

C. All lot areas shall be graded so that surface water will run-off away from the house pad to the front or rear collection system without causing erosion or accumulation in low areas. Lots shall be graded in compliance with the approved grading plans to drain surface water from the house pad to the street gutters and/or to the rear to common grass-lined swales and receiving structures.

D. All lot areas shall be provided with a minimum of 4” of topsoil that is relatively free of excessive rocks and stones greater than 1-1/2” in diameter. Lot areas shall also be adequately stabilized by the planting of grass or other vegetation or by some other means acceptable to the Town. Grass or other vegetation, if used as a means of stabilization, shall be adequately established with a reasonable stand of growth as determined by the Town.

E. Sump pump drains, laterals and dry wells properly installed.

F. Road surface, gutters and sidewalks repaired, cleaned and all debris removed.

G. Curb boxes and cleanouts adjusted to grade.

H. All lot corners are to be located with iron pins or other markers as appropriate.

I. All structures shall have numbers in conformance with the town’s ordinances.

J. All sidewalks installed along the property frontage.

K. All street trees installed.

L. Payment of all special district fees, unless otherwise directed by Town Board.

M. All utility services to structures are buried a minimum of two feet (2’) below
finished grade.

N. A copy of correspondence from the Monroe County Health Department noting acceptance of complete septic system.

O. An instrument survey showing the completed structure, minimum setback distances, first floor elevation, garage floor elevation, cleanout locations, easements, and location of property pins.

P. All permit fees are paid.

Note: If any of these items are not completed, a Temporary Certificate of Occupancy may be issued by the Building and Zoning Department with the issuance of the final Certificate of Compliance being contingent upon the completion of such outstanding items. The builder or owner shall submit a certified check in an amount necessary to complete all remaining items, including, but not limited to, sidewalks, landscaping, erosion control, property pins, development fees, or other items as deemed necessary.
SECTION 6 - DESIGN REQUIREMENTS

6.1 GENERAL
The intent of these regulations is to assure that all infrastructure and facilities that are to be dedicated to the Town of Penfield for maintenance are properly constructed and can be easily maintained. Failure of the developer, their agents, employees or subcontractors to comply with these specifications shall be considered sufficient cause by the Town of Penfield to not accept the utilities or any portion thereof for dedication until all work is completed to the terms set forth herein.

Where a conflict arises between these regulations and those of other agencies, the developer shall make known to the conflicting agencies the area of disagreement and endeavor to have such agencies resolve their differences before proceeding with development.

The term "infrastructure" as used herein shall be defined as all physical improvements for a project, including, but not limited to, roads, street lights, sidewalks, stormwater and sanitary sewers, pump stations, ditches, culverts, stormwater control facilities, parks, trails, and associated appurtenances.

6.2 BASIS OF DESIGN
Developers are responsible for the proper design of all improvements, subject to the approval of the town. The design of improvements shall be done by a professional engineer licensed to practice in the State of New York and has experience in the design of such features. The design shall conform to the requirements set forth herein.

All development shall be consistent with the Sanitary Sewer Master Plan, Drainage Studies, Bike Facility Study, regional studies, Town of Penfield zoning ordinances, local laws, and all special district requirements.

The design of any development shall contain a layout that shall avoid placing appurtenances such as manholes, catch basins, laterals, cleanouts, monuments, hydrants, or other features required by the Town of Penfield within driveways, sidewalks, or road pavement areas.

Sanitary Sewer pipes and manholes shall be extended to the property line to provide future service to the adjoining lots.

All infrastructure improvements shall be located to permit adequate access for maintenance personnel.

All new electric services, telephone service, and cable TV lines shall be installed underground and in accordance with Public Service Commission Rule 3.9 governing Underground Residential Distribution Systems.

6.3 DESIGN STANDARDS
In addition to these specifications, the latest edition of the following design standards are to be considered included:


b. Design and Construction of Sanitary and Storm Sewers, American
6.4 PENALTIES FOR NON-COMPLIANCE

Penalty for non-compliance with these Regulations is provided for in the Town of Penfield "Sewer Use Ordinance", the “Town of Penfield Stormwater and Erosion Control Law”, and the “Construction Stormwater Pollution Prevention and Erosion and Sedimentation Control Law”. In addition, the failure of any development to comply with the provisions in this document will result in the withholding of final site plan approval or a building permit or issuance of a Stop Work Order by the Town of Penfield until a remediation plan is established. The Town of Penfield reserves the right to issue fines and charge for staff time to remedy any such situation for any non-compliant activities and to invade the developer’s letter of credit to insure that adjoining properties are protected and that the construction site is safe and secure.

6.5 RESPONSIBILITY FOR WORK

The developer is solely responsible to the Town of Penfield for proper design, construction, and maintenance of infrastructure improvements. Where a developer does not complete the buildings on a project, the original developer shall be responsible for all permits, punch list items, erosion control, and restoration work until a new letter of credit has been submitted by the builder.

6.6 LATERALS AND SERVICES

Each proposed development lot or structure that is intended to be served by public utilities shall be provided with a sanitary sewer lateral, storm sewer lateral, and water service, where such service is available. All laterals and water services shall be shown on the Utility/Lateral Service Plan. All laterals shall be constructed from the main line utility to ten (10’) feet past the right-of-way limit or easement line, whichever is farther.

Where these services are not immediately connected to the structure, the ends shall be properly plugged and marked with a hardwood stake extending from the invert of the conduit to three (3’) feet above finished ground. The top of each stake shall then be painted using the following color code:

- Sanitary Lateral - Green
- Storm Lateral - White
- Water Service - Blue

A record of each sanitary and storm wye location shall be coordinated between the Town of Penfield’s Inspector and the utility contractor. The Town of Penfield will compile and submit these locations to the project engineer. Under no circumstance shall these be buried without approval of the Town of Penfield’s inspector.

Contractor shall be required to repair any illegal cross connections of laterals to the properly designated utility.

6.7 UTILITY ROAD CROSSINGS

Proposed storm sewer, sanitary sewer, watermain, or other utility crossings of existing town
highways shall be bored. Under special conditions, such as a high rock table or boulder conflicts, town roads may be open cut with the approval of the Department of Public Works. First class steel pipe casing with welded joints shall be used. The casing diameter shall be a minimum of eight (8”) inches larger than the outside diameter of the bell ends of the carrier pipe. A highway permit must be obtained from the Department of Public Works, county, or state officials. A detailed drawing of each proposed highway crossing shall be submitted to the regulating agency for review and approval prior to undertaking any work associated with the crossing. The drawing shall include:

- Excavation limits of boring pits;
- Temporary or permanent easements, where required;
- Type and extent of sheeting;
- Location of traffic safety barriers/signs;
- Town of Penfield highway right-of-way limits;
- Pavement and shoulder limits;
- Pipe and casing type, grade and strength class;
- Case filling material (Flowable fill consisting of fly ash and cement);
- Profile indicating elevation of existing utility lines;
- Location of all known utilities within the work zone.

All disturbed areas shall be restored to their original condition. Proper barricades, lighting, and signage shall be provided to delineate any open excavations or unsafe pavement.

If the open cut method is permitted, the actual operation, backfill and restoration shall be completed in accordance with the "Pavement Restoration Detail" provided herein.

The Irrevocable Letter of Credit amount will be withheld until an inspection is made by the Department of Public Works six (6) months after the completion of the operation. Any settlement or heaving of pavement over the backfilled trench shall be repaired to the satisfaction of the Department of Public Works prior to the final release of money held in the Irrevocable Letter of Credit.

NOTE: The installation of any utility shall be subject to the inspection of the Engineering Department. Restoration of the roadway shall be inspected by the regulating authority.
SECTION 7 - SANITARY SEWER SYSTEMS

7.1 INDIVIDUAL SEWAGE DISPOSAL SYSTEMS (ISDS)
Where existing sanitary sewers are not within close proximity of the proposed development site, as determined by the Engineering Department, an ISDS may be utilized.

Each ISDS shall be designed in accordance with the current policies and directives of the Monroe County Health Department and the New York State Department of Environmental Conservation and shall be approved by the Monroe County Health Department.

Use of individual disposal systems shall also meet the following minimum standards of the Town of Penfield:
   a. Percolation and deep hole tests should be taken in the location of the proposed leach field and be shown on the site plan drawing. All percolation tests shall be sixty (60) minutes or less for conventional septic systems.
   b. The net usable land area for each leach field shall be one and one-half (1.5) times the area required for the initial design layout to permit the installation of additional leach lines at a future date. This area shall be designated on all approved plans.
   c. Each single family home shall be designed for a four (4) bedroom home. All other facilities shall be designed to meet the maximum occupancy of the use.

Installation of holding tanks, seepage pits, raised fill systems, or other non-conventional on-site systems will be considered only with written approval of the Monroe County Health Department. The use of said disposal systems shall also meet the approval of the Town Engineer.

All repairs, modifications, and/or replacements of septic systems shall be done in accordance with Monroe County Health Department requirements and may be subject to permit from that department.

7.2 LOW PRESSURE SEWAGE SYSTEMS (LPSS)
Where existing sanitary sewers are not within close proximity of the proposed development site, as determined by the Engineering Department, a LPSS may be used as an alternative to Individual Sewage Disposal Systems.

Use of Low Pressure Sewage Systems shall meet the following minimum standards of the Town of Penfield:
   a. Each property shall utilize its own grinder pump, located on private property.
   b. The pump shall consist of equipment manufactured by Environment One or an equivalent approved by the Town Engineer and Director of Public Works.
   c. The discharge pipe between each individual pump and the shared force main shall consist of one and one-quarter (1 ¼”) inch diameter DR-11 pipe (HDPE).
   d. A “Uni-Lateral” or approved equivalent, stainless steel curb stop/check valve combination lateral valve shall be installed on each individual discharge line at the right-of-way.
   e. The shared force main shall also consist of DR-11 pipe (HDPE) and be sized appropriately by the developer's engineer.
   f. The force main shall be sized to accommodate the full build-out of the proposed development and adjacent properties and maintain a constant velocity of at least two (2 fps) feet per second.
   g. A “DeZurik” or approved equivalent pressure air relief valve is to be installed at the high points along the force main.
   h. Flush port access valves shall be installed within manholes every one thousand (1000’) feet along the length of the force main as shown in the Standard Details.
7.3 SANITARY SEWER SYSTEM - DESIGN REQUIREMENTS

Design for sanitary sewers shall be based on the earth loading occurring at the transition width. Designers shall assume a Class C bedding, load factor of one and one-half (1.5), and safety factor of one and one-half (1.5) in their design calculations (except for RCP = 1.0). Specifications for construction shall stipulate a granular bedding (Class C) as indicated in the details provided herein and per the American Society of Civil Engineers publication No. 37, "Design and Construction of Sanitary and Storm Sewers", copyright 1969. The granular bedding shall be #1 and #2 (approximately a 50-50 mixture) crushed stone in conformance with the New York State Department of Transportation Specification 623-03.

Also, unless substantiated by test results, the designer shall assume the following:

- 120 pounds per cubic foot
- \( Ku' = 0.13 \) (curve D, page 189, ASCE publication No. 37)
- \( 0.5 @ Ku' = 0.65 \) (page 191, ASCE publication No. 37)
- Shaped bottoms will not be permitted.

All sewers shall be designed in accordance with the standards of the Town of Penfield, New York State Department of Environmental Conservation, Monroe County Department of Health, and Monroe County Pure Waters. The entire sanitary sewer system must also conform to the rules and regulations of the Town of Penfield Sewer Use Ordinance.

When designing sewer profiles, consideration shall be given to the relationship of the house elevation to the sewer elevation to assure the installation of laterals have a minimum slope of one (1%) percent grade or one-eighth (1/8”) inch per foot.

Manholes shall be spaced a maximum of three hundred (300’) feet apart, unless otherwise directed by the Director of Public Works. Manholes shall not be located within the roadway, gutters, or driveways. Manholes shall be located to avoid any connections with an angle greater than ninety (90°) degrees to the flow.

The sanitary sewer profile shall be designed with a minimum drop of one-tenth (0.1’) foot and a maximum drop of one and one-half (1.5’) foot within manholes. Any drop greater than one and one-half (1.5’) foot shall be achieved through the use of an inside drop connection as shown in the Standard Details.

Manholes shall be of minimum diameter as shown in Standard Details.

Manhole inverts shall be constructed to provide the minimum geometric configuration as shown in the Standard Details. Acceptable invert material shall be solid red sewer brick, clay tile one-half (1/2) pipe, or other materials & methods as approved by the Director of Public Works.

The invert of a three-way manhole will have a minimum radius equal to one-half (1/2) the diameter of the manhole, as shown in the Standard Details. No "T" intersections will be acceptable.

There shall be a vertical separation between storm sewer pipes, sanitary pipes, and laterals of at least eighteen (18”) inches in the event that these pipes cross the same vertical plane. However, if existing pipes are encountered and the minimum eighteen (18”) inch separation cannot be achieved, the entire trench area at the crossing shall be encased using #1 and # 2 crushed stone. Concrete encasement shall not be permitted.

Laterals shall be designed and constructed in conformance with the specifications for main line sewers. Taps to an existing sewer main shall be made with a General Engineering Co., DF-40 cast iron saddle
with alignment flange, Sewer Tap Inserta Tee, Sewer Tap Inserta Wye, or equal approved by the Director of Public Works. The connection shall be encased in crushed stone.

Cleanouts will be installed on the right-of-way line or easement line with an additional ten (10’) foot length of lateral pipe past the cleanout. Cleanouts shall not be installed in a driveway.

The cleanout shall be left a minimum of three (3’) feet above the final proposed grade and plugged with a ferrous metal cap and marked with a hardwood marker, as shown in the Standard Details, until connection to the house has been made.

Where laterals must extend a long distance to the sanitary main, cleanouts are required at a maximum spacing of every seventy-five (75’) feet.

Laterals shall not be installed at depths greater than ten (10’) feet below finished grade and in the event the main line sewer is greater than ten (10’) feet deep, a lateral riser shall be installed and encased in crushed stone as shown in the Standard Details.

Each sanitary lateral shall be fully extended, plugged and tested along the main line sewer.

Sewer lines shall be located within cul-de-sac areas so lateral lines shall be as short a run as possible. The layout of any sewer lines within the cul-de-sac area shall be subject to the review of the Director of Public Works and Town Engineer.

### 7.4 MATERIALS

**A. General**
All sewer materials shall be new, free of damage, and in conformance with these specifications. Pipe that shows signs of damage or ultraviolet (UV) deterioration will be rejected.

**B. Sanitary Sewer Main:**
Pipe shall meet any of the following:
- Ductile iron pipe (DIP) shall conform to AWWA C115. Fittings shall conform to AWWA C110. Joints shall conform to AWWA C111. Pipe shall be centrifugally cast conforming to ANSI Specification A21.51, cement lined in accordance with A21.4 with push-on type rubber ring gasket, minimum Class 50.
- Polyvinyl Chloride (PVC) pipe and fittings shall have bell and spigot joints with flexible elastomeric gaskets. SDR 35 polyvinyl chloride pipe (PVC) and fittings shall meet the requirements of ASTM D3034, type PSM, with joints conforming to ASTM D3139. SDR 21 polyvinyl chloride pipe (PVC) and fittings shall meet the requirements of ASTM D2241 with joints conforming to ASTM D3139. All flexible elastomeric gasket joints shall conform to ASTM D3212.
- High Density Polyethylene (HDPE) pipe shall be continuous fusion welded DR17 (HDPE) pipe and fittings manufactured from extra high molecular weight “EHMW” PE 3408, meeting the requirements of ASTM D3350 with a Flexural Modulus of one hundred thirty-three thousand (133,000 psi) pounds per square inch (ASTM D790) and a Tensile Strength at yield of three thousand two hundred (3,200 psi) pounds per square inch (ASTM D638) and shall conform to the dimensional requirements of ASTM F714.

**C. Force Mains**
Pipe shall meet any of the following:
- SDR-18 polyvinyl chloride pipe (PVC) with gaskets between joints meeting the requirements of AWWA C900 with a Class 150 pressure rating.
- DR-17 pipe (HDPE) or Restrained Joint polyvinyl chloride pipe (PVC).
- Ductile iron pipe (DIP) CL52.

Note: All force main piping shall include number ten (10) gauge tracer wire terminating within structures.

D. Lateral Connections
Connections shall meet the following:
- For SDR-35 polyvinyl chloride pipe (PVC) mains, install a four (4") inch SDR-35 polyvinyl chloride pipe (PVC) wye. Then install a four (4") inch SDR-35 polyvinyl chloride pipe (PVC) to SDR-21 polyvinyl chloride pipe (PVC) one-eighth (1/8) bend adaptor.
- For ductile iron pipe (DIP) CL52 mains, install a four (4") inch CL25 mechanical joint wye and associated fittings to accept a four (4") inch ductile iron pipe (DIP) or a four (4") inch SDR-21 polyvinyl chloride pipe (PVC).
- For existing sewer mains, install a Genco DF-40 cast iron saddle with alignment flange or a Sewer Tap Inserta Tee or Inserta Wye.
  - Use of a Genco DF-40 cast iron saddle with alignment flange will require a five (5") inch hole to be cored into the existing main and saddle strapped over with the proper size stainless steel straps. Then use four (4") inch SDR-21 polyvinyl chloride pipe (PVC) lateral pipe.
  - Use of a Sewer Tap Inserta Tee or Inserta Wye shall be installed according to the manufacturer's specifications.
- No lateral pipes shall extend into the flow area for the main sewer
- All lateral connections shall be cradled in crushed stone.

E. Lateral Pipe
Lateral pipe installed within the public right-of-way limits shall meet the following:
- SDR-21 polyvinyl chloride pipe (PVC) pipe meeting ASTM D2241; or
- DR-17 pipe (HDPE) (for directionally drilled laterals) with associated fittings.

Prior to the installation of a lateral connection to a residence, an entry fee shall be paid to the Town of Penfield and the required permit shall be issued.

All commercial laterals shall be a minimum six (6") inch diameter, SDR-35 pipe polyvinyl chloride pipe (PVC) and connected to the nearest, downstream manhole, unless otherwise directed.

F. Manholes
All sanitary sewer manholes shall be in conformance with ASTM C478 and the details shown in the Standard Details.

Whenever the grade around an existing manhole must be changed, the developer shall be responsible to raise or lower the frame and grate or manhole barrel to finish grade with the approval of the Director of Public Works. Notice must be given to the Town of Penfield prior to any work being done on any existing manhole.

A properly sealed connection between manholes and sewer mains shall be completed by one (1) of the following methods:
- Cast in boot coupling.
- Mechanical tightening right type sleeve joint area shall be finished with non-shrink grout.
- Link seal or approved equal.

Benches shall be constructed with five thousand (5,000 psi) pounds per square inch concrete conforming to Manitou Concrete Mix ID # 1696 or equal.
All manholes with vertical drops in excess of one (1') foot shall have internal tees with a clean out installed according to Town of Penfield’s Standard Details.

**G. Special Appurtenances**

When conditions arise that require a special design, material and/or construction method not specified within these regulations, the applicant shall submit all pertinent information to the Town Engineer and Director of Public Works for review and approval.

### 7.5 INSTALLATION

**A. Handling Pipe**

All pipes and fittings shall be handled carefully. Pipes and fittings shall not be dumped or dropped while unloading or during placement in the trench. Cracked, UV discolored, or otherwise damaged materials shall not be used.

**B. Stockpiling Pipe**

The contractor shall take all necessary precautions to insure that stored material does not create a safety hazard or impair the free flow of vehicular or pedestrian traffic. All stored material shall be placed well outside existing or proposed public right-of-ways. All polyvinyl chloride pipe (PVC) shall be covered with tarp to protect against UV deterioration.

**C. Fitting or Cutting Pipe**

The joint surfaces of all pipes and fittings shall be clean and shall fit together to form a tight joint. When installing pipe, the workmanship and tools used shall be such that the quality and strength of the pipe is not impaired.

**D. Joining Pipe**

All pipe sections shall be properly joined in accordance with the manufacturer's recommendations to insure a watertight connection. Suitable excavation shall be made to receive the socket or collar, which shall not bear upon the subgrade or bedding.

**E. Pipe Line and Grade**

All pipe shall be laid true to line and grade with bells upstream and shall have a full, firm and even bearing. Boulders or other natural obstructions shall not be considered cause for varying from true line and grade. The maximum offset at the invert of pipe shall be one (1%) percent of the inside diameter of the pipe or three-eighths (3/8") inch, whichever is smaller.

**F. Trenches**

Any suitable excavation methods may be used but sewer trenches shall be confined to the smallest area practical for proper construction. Hand methods shall be employed where it is deemed necessary by the Town Engineer or Director of Public Works to preserve trees or protect existing structures. All necessary precautions shall be taken when blasting to confine flying stone or debris and to protect and prevent damage to adjacent structures.

Where required by OSHA standards, trench and/or soil conditions, sheeting and/or bracing shall be used to provide support and stability to the trench walls. Determinations of where and when shoring will be required shall be the responsibility of the excavation contractor and in accordance with applicable OSHA law and regulations. Unless otherwise directed, sheeting and bracing shall be removed as trenches are backfilled. All requirements of the OSHA law and regulations shall be maintained by the excavating contractor for trench and blasting operations.

**G. Spoil**

Excavated material unsuitable for backfill shall be removed from the site of the work as it is excavated.
Excavated material that is to be used for backfill shall be placed in spoil banks located on only one side of the trench(es) or pit(s) and at least two (2') feet away from the excavation wall. These spoil banks shall be located where they will not interfere with the work or contribute an overload to the wall of the excavation. Where necessary, the excess material shall be removed and relocated to an alternate location and brought back when required. A minimum of twenty-four (24") inches of clean safety cover is required over the sewer pipe. Blasted rock or boulders six (6") inches in diameter or smaller may be used with backfill if the material is kept a minimum of twenty-four (24") inches from the wall of the pipe.

H. **Drainage**

Necessary precautions shall be taken at all times to prevent the flooding of adjacent property. Drainage ditches, necessary relocation of stream channels, or other positive means of diverting and/or controlling the water shall be employed. No water shall be drained into a pipe or trench under construction. Water shall not be allowed to accumulate in the trenches but shall be drained or pumped away from the work to establish drain channels.

I. **Installation**

Sewers shall be installed using an approved laser beam operation. The contractor shall be responsible for maintaining the proper horizontal and vertical alignments at all times.

In situations where the laser equipment cannot be set up, and upon the approval of the Director of Public Works, batter boards may be used. The contractor shall install batter boards and two (2) parallel string lines with a minimum spacing of four (4') feet prior to laying the pipe. Batter boards shall be set at not more than fifty (50') foot intervals. The pipe shall be set carefully to line and grade using a grade pole. A string line shall be set at least one hundred fifty (150') feet, over at least three (3) grade stakes, alongside the trench preceding pipe laying operations to assist the shovel operator and guard against errors in grade stakes.

All pipe shall be laid in accordance with the approved plans line and grade, with uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the socket or collar, which shall not bear upon the subgrade or bedding. Any pipe that is not in true alignment or shows any undue settlement shall be exposed and re-installed at the contractor's expense.

Sanitary laterals shall have clean outs installed at the right-of-way or easement line, at the foundation wall, and at intervals of no more than seventy-five (75') feet from each other.

The grade shall be checked at each manhole to verify grade is consistent with approved plans. Any deviation of five (5%) percent or greater from the approved slope shall be exposed and re-installed.

Manholes cover riser rings shall be used on manholes installed in roadways or sidewalks to provide full depth of all materials over the top slab. In lawn areas, a minimum of six (6") inches of topsoil shall be placed over the manhole slab.

J. **Earth Foundations**

Where pipe is installed on a stone bedding with an earth foundation, the trench bottom shall be bedded as specified herein. Low areas shall be filled with suitable crushed stone. Where rock in either ledge or boulder formation is encountered, it shall be removed below grade and replaced with crushed stone as shown in the Standard Details. Where a stable subgrade is not encountered at the grade established due to soft, spongy or other unstable soil (unless other special construction methods are called for on the plans), all such unstable soil, under the pipe and for a width of at least three (3) times the diameter of the pipe, shall be removed and replaced with suitable crushed stone or other approved suitable material properly compacted to provide adequate support for the pipe line.
K.  **Bedding and Backfilling**
Sewers, including all laterals, shall be constructed using crushed stone bedding as specified previously and as shown in the Standard Details. Sewer pipe shall be bedded with a minimum of four (4") inches of #1 and #2 crushed stone. This stone shall be brought up to the pipe spring line and manually consolidated (chinked). Where sewers are being installed in rock the main and laterals shall be encased with crushed stone to an elevation of two (2') feet above the crown of the pipe. In both cases, two (2') feet of backfill material, free of rocks over six (6") inches in diameter, shall be placed on the pipe and lightly compacted. This backfill operation shall follow no more than thirty (30') feet behind the installation operation. The backfill operation shall be inspected by the Town of Penfield.

L.  **Cradle**
Where called for on the plans or as ordered by the Town Engineer or the Director of Public Works to meet field conditions, pipe shall be installed with a cradle. The Town Engineer will determine at the time of construction whether a dry or plastic mix will be used at any particular location depending upon trench conditions. The cradle shall be constructed of 1:2-1/2:5 concrete, using commercial Type 1 Portland Cement and clean, hard aggregate. Cradle material shall be placed to the width shown on the plans or as ordered by the Town Engineer and to an elevation one-fourth (1/4) up the side of the pipe. The pipe shall be laid in a channel formed in the material by means of a round-pointed shovel. High points and low spots shall be corrected and the pipe firmly bedded to line and grade and jointed.

Additional cradle material shall then be added and tamped along the haunches of the pipe and subsequently shaped to the top of the pipe as shown in the Standard Details. A "safety cover" of nine to twelve (9-12") inches of earth shall then be placed and backfilled as required in these specifications.

M.  **Protection of Existing Sewers**
During the course of new sewer construction every precaution shall be taken to ensure that contamination of the existing sewer system is prevented. These precautions shall include isolating the new sewer work from the live sewer system at the earliest possible opportunity.

If connecting into a dead end manhole a mechanical plug shall immediately be placed in the downstream pipe and securely tied off. If connecting into a manhole which cannot be plugged off due to existing flow the contractor shall be responsible in all regards to ensure that mud, dirt or groundwater does not enter the live sewer system. If ground water is present the contractor shall employ sufficient pumps to keep the ground water from flowing through the new pipe until the first manhole is reached. At that point and before any additional work is undertaken the contractor shall install a mechanical plug in the new manhole in the downstream pipe, tied off to prevent movement.

The cost of cleaning or flushing of existing downstream facilities, required as a result of failure to comply with this specification will be borne by the developer, and taken from the Letter of Credit.

N.  **Construction Under Adverse Conditions**
No pipe shall be laid during adverse weather conditions. In no case shall pipe be laid in water. In cases where sewers are being installed in wet conditions or below the groundwater table so that installed pipes become submerged overnight, sufficient backfill shall be placed to prevent the pipe from becoming buoyant.

O.  **Conflicting Pipe Lines and Other Utilities**
No existing pipe line, conduit, cable, pole, guy wire or other utilities or portion thereof shall be moved without the consent of the Agency operating such utility.

Any necessary changes in line or grade of the new pipe line shall be made only with the consent of the
Director of Public Works and the Town Engineer.

P. Connections to Existing Manholes and Sewers
Where connections must be made between a new sewer main and an existing sewer manhole, the opening shall be cored, using an appropriate coring tool and bit and the connection shall be made by an appropriate sealing mechanism as described in Section 7.3 (Materials) – F above. Taps to the existing sewer mains shall be made using an approved Genco Cast Iron Saddle, Sewer Tap Inserta Tee, or Sewer Tap Inserta Wye. The contractor shall take necessary precautions as required by the Confined Entry Requirements of OSHA. No entry to live manholes will be allowed until appropriate Confined Entry procedures are met.

Q. Lateral Repairs
Where repair of an existing lateral pipe is necessary the section to be replaced shall be replaced with appropriate diameter SDR-21 polyvinyl chloride pipe (PVC). Connection to remaining upstream and downstream lateral piping shall be accomplished with Furnco (Strong Back RC Series Repair Couplings), or approved equal. This coupling allows superior resistance to shear forces and subsequent misaligned joints. Extreme care shall be taken to provide proper pipe bedding and lateral support, utilizing #1 and #2 crushed stone bedding. Dewatering and removal of contaminated bedding material will be required. If the repair involves the existing transition from the home lateral to the portion of the lateral within the right-of-way or easement, a clean-out shall be installed. The clean-out shall be installed on, or as close to as practical to, the right-of-way or easement line and be the same diameter as the lateral which it serves.

7.6 TESTING
A. General
All sanitary sewers and manholes must be cleaned and tested before being accepted. As required, the contractor shall perform a mandrel test for acceptable deflection on polyvinyl chloride pipe (PVC) sanitary sewer mains.

A visual inspection of each section of completed sewer shall be made for smoothness of invert, freedom from obstructions and straightness of line. The sewer shall be completely watertight and free from any groundwater water infiltration.

Each stretch of sewer including laterals and clean outs shall be tested to insure there is no groundwater infiltration, either by means of air pressure testing or by water exfiltration test.

B. Sewer Air Pressure Testing
Air testing of the sewer main is preferred to using the Water Exfiltration Test. The Air Pressure Test shall be performed using the below stated equipment, according to stated procedures and under the supervision of the Town of Penfield’s inspector.

Equipment used shall meet the following minimum requirements:
• Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.
• Pneumatic plugs shall resist internal test pressures.
• One (1) pneumatic plug shall contain a connection for the air pressure hose.
• The air pressure hose shall have a gauge capable of accurately measuring pressure between zero and ten (0-10 psig) pounds per square inch gauge in one (1 psig) pound per square inch gauge increments.
• The air pressure hose shall have a shut-off valve.

After a manhole-to-manhole stretch of pipe has been backfilled and cleaned, the plugs shall be placed in
the line at each manhole and inflated. The plugs shall hold against pressure. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches a minimum of four (4 psig) pounds per square inch gauge greater than the average back pressure of any ground water than may be over the pipe. The air supply valve shall then be shut off.

The portion of line being tested shall pass the test if no pressure drop is observed after the time required, in minutes, as shown in the following table, for the given pipe diameter:

<table>
<thead>
<tr>
<th>Pipe Diameter in Inches</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>8</td>
<td>4.0</td>
</tr>
<tr>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td>12</td>
<td>5.5</td>
</tr>
<tr>
<td>15</td>
<td>7.5</td>
</tr>
<tr>
<td>18</td>
<td>8.5</td>
</tr>
<tr>
<td>21</td>
<td>10.0</td>
</tr>
<tr>
<td>24</td>
<td>11.5</td>
</tr>
</tbody>
</table>

In areas where ground water is known to exist, the contractor shall install a one-half inch (1/2") diameter capped pipe nipple, approximately ten (10') feet long, through manhole wall on top of one (1) of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the Line Acceptance Tests, the ground water shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the nipple. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken after the water has stopped rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the pounds of pressure that will be added to all readings. (For example, if the height of water is eleven and one-half (11.5') feet, then the added pressure will be five (5 psig) pounds per square inch gauge. This increases the three and one-half (3.5 psig) pounds per square inch gauge to eight and one-half (8.5 psig) pounds per square inch gauge and the two and one-half (2.5 psig) pounds per square inch gauge to seven and one-half (7.5 psig) pounds per square inch gauge. The time period remains the same.)

If sewer main fails to pass this test the contractor shall, at his own expense, determine the source of leakage. He shall then repair or replace all defective materials and/or workmanship as specified, herein. The air test shall be repeated until the section of sewer passes the test as outlined above.

C. Sewer Water Exfiltration Test

In lieu of Sewer Air Testing the contractor can perform a Water Exfiltration Test based on the following criteria.

Tests shall be carried out over a period of at least three (3) hours and the total leakage of any section tested shall not exceed the rate of one hundred (100) gallons per mile of pipe per twenty-four (24) hours per inch of nominal diameter. If leakage exceeds the specified amount, the contractor shall make the necessary repairs to reduce the leakage within the specified limits and the tests shall be repeated until the leakage requirement is met. A Town of Penfield inspector shall witness all tests. Where there is a difference of seven (7') feet in elevation of inverts between manholes, this section of sewer shall be tested by air and manholes checked by water. Manholes shall be completely watertight. The air test will be conducted as follows:
The allowable exfiltration rates are as follows:

<table>
<thead>
<tr>
<th>Pipe Diameter (Inches)</th>
<th>Allowable Rate (Gallons/hr/100 feet of pipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.316</td>
</tr>
<tr>
<td>6</td>
<td>0.474</td>
</tr>
<tr>
<td>8</td>
<td>0.631</td>
</tr>
<tr>
<td>10</td>
<td>0.789</td>
</tr>
<tr>
<td>12</td>
<td>0.947</td>
</tr>
<tr>
<td>15</td>
<td>1.184</td>
</tr>
<tr>
<td>18</td>
<td>1.421</td>
</tr>
<tr>
<td>21</td>
<td>1.657</td>
</tr>
<tr>
<td>24</td>
<td>1.894</td>
</tr>
<tr>
<td>27</td>
<td>2.131</td>
</tr>
<tr>
<td>30</td>
<td>2.367</td>
</tr>
<tr>
<td>33</td>
<td>2.604</td>
</tr>
<tr>
<td>36</td>
<td>2.841</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Manhole size</th>
<th>Gallons/Inch Drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>4' diameter MH</td>
<td>7.833 gallons</td>
</tr>
<tr>
<td>5' diameter MH</td>
<td>12.239 gallons</td>
</tr>
<tr>
<td>6' diameter MH</td>
<td>17.624 gallons</td>
</tr>
<tr>
<td>7' diameter MH</td>
<td>23.989 gallons</td>
</tr>
<tr>
<td>8' diameter MH</td>
<td>31.332 gallons</td>
</tr>
</tbody>
</table>

**D. Manhole Exfiltration Water Test**

After the sewer main has been air tested and approved by the Town of Penfield’s inspector, the manholes can either be tested by water exfiltration or vacuum testing. Water exfiltration tests shall be run using the following procedure.

The inlet and outlet pipe for the manhole shall be plugged with a plumber’s plug that allows no leakage. The manholes shall be filled with water to a height above the frame seam. The water shall remain for one (1) hour to allow for stabilization and soaking of the water into the concrete.

The test shall be run for a minimum of three (3) hours. Measurements from the top of water to the top of frame at the start and finish of the test shall be taken.

The allowable leakage within the manhole shall be as follows:

<table>
<thead>
<tr>
<th>Manhole Depth</th>
<th>Allowable Leakage (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0'-0” to 12'-0”</td>
<td>0.10</td>
</tr>
<tr>
<td>12'-1” to 16'-0”</td>
<td>0.15</td>
</tr>
<tr>
<td>16'-1” to 20'-0”</td>
<td>0.20</td>
</tr>
<tr>
<td>over 20'-0”</td>
<td>0.25</td>
</tr>
</tbody>
</table>

**E. Manhole Vacuum Test**

The use of manhole vacuum test may be allowed if:
- The test equipment is NPC Manhole vacuum tester or equal approved by the Town of Penfield’s
The manhole is within one (1') foot of finished grade.

Vacuum tests shall be conducted according to the following procedure:
1. The inlet and outlet pipe for the manhole shall be plugged with a plumber’s plug that allows no leakage.
2. A portable vacuum tester should then be placed over the manhole frame and vacuum pump turned on.
3. The shut-off valve on the vacuum pump must remain open until the vacuum has drawn a minimum of ten (10") inches of Mercury (Hg), at which time the shut-off valve may be closed.
4. Once the valve has been closed, the test may begin.
5. The test shall be run for at least one (1) minute and the allowable leakage may not exceed one (1") inch of Mercury (Hg) during the duration of the test.

F. Video Inspection of Mains
Following acceptable testing of the entire sanitary sewer system, the town shall perform a video inspection of the pipe interior. Any deficiencies noted shall be repaired by the site contractor and/or their agent(s) prior to allowing the sewer to be put into service. These problem areas shall then be re-televisioned prior to the expiration of the maintenance bond.

G. Force Main Testing
After the pipe has been laid the entire length shall be subject to a hydrostatic pressure of at least one and one-half (1.5) times the working pressure at the point of testing.

Test Pressure Restrictions:
- Not be less than one and one-half (1.5) times the working pressure at the highest point along the test section.
- Not exceed pipe or thrust restraint design pressure.
- Be of at least a two (2) hour duration.
- Shall not lose any pressure.
- Not exceed twice the rated pressure of the valves when the pressure boundary of the test section includes closed gate valves.
- Not exceed the rated pressure of the valves if resilient seated butterfly valves are used.

Each section of pipe shall be filled with water slowly and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gauge, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Town of Penfield.

Before applying the specified test pressure, air shall be expelled completely from the pipe and valves. If permanent air vents are not located at all high points, the contractor shall install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Director of Public Works.

All exposed pipe, fittings, valves and joints shall be examined carefully during the test. Any damaged or defective pipe, fittings or valves that are discovered following the pressure test shall be repaired or replaced with sound material and the test shall be repeated until it is deemed satisfactory by the Director of Public Works.
No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{N \times D \times P}{7400}$$

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

Allowable leakage at various pressures is shown in the following table:

<table>
<thead>
<tr>
<th>Avg. Test Pressure (psig)</th>
<th>3</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>13</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>450</td>
<td>0.48</td>
<td>0.64</td>
<td>0.95</td>
<td>1.27</td>
<td>1.59</td>
<td>1.91</td>
<td>2.23</td>
<td>2.55</td>
<td>2.87</td>
<td>3.18</td>
<td>3.82</td>
</tr>
<tr>
<td>400</td>
<td>0.45</td>
<td>0.60</td>
<td>0.90</td>
<td>1.20</td>
<td>1.50</td>
<td>1.80</td>
<td>2.10</td>
<td>2.40</td>
<td>2.70</td>
<td>3.00</td>
<td>3.60</td>
</tr>
<tr>
<td>350</td>
<td>0.42</td>
<td>0.56</td>
<td>0.84</td>
<td>1.12</td>
<td>1.40</td>
<td>1.69</td>
<td>1.97</td>
<td>2.25</td>
<td>2.53</td>
<td>2.81</td>
<td>3.37</td>
</tr>
<tr>
<td>300</td>
<td>0.39</td>
<td>0.52</td>
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*For pipe with 18 ft nominal lengths. To obtain the recommended allowable leakage for pipe with 20 ft nominal lengths, multiply the leakage calculated from the table by 0.9. If the pipeline under test contains sections of various diameters, the allowable leakage will be the sum of the computed leakage for each section.

Acceptance shall be determined on the basis of allowable leakage. If any test of pipe laid discloses leakage greater than that specified, the contractor shall, at his own expense, locate and repair the defective material until the leakage is within the specified allowance.

All visible leaks are to be repaired regardless of the amount of leakage.

### 7.7 PUMP STATION DESIGN

Due to certain topographic and/or geographic constraints the orderly and systematic expansion of the sewer system may require the use of a sewage lift station to transmit proposed effluent to the appropriate gravity collector sewer. After careful consideration of engineering data, possible alternatives and compliance with general sewer planning goals the Engineering Department will render an opinion as to the appropriateness of a sewage lift station at a given location, as well as goals of a particular installation. In general, sewage lift stations may be allowed so long as they are endorsed by the Engineering Department, located and sized so as to provide the maximum benefit to not only the new development but also adjacent areas without sewer access and provide for ease of access and maintenance.

Through the planning process the Town of Penfield and developer shall agree on the most
advantageous location for a lift station. Once this location has been determined, the developer’s
engineer shall prepare an Engineering Report that identifies the following design parameters:

- Anticipated service area and flow rates (initial and full build-out)
- Hydraulic Considerations
  - Static Head
  - Total dynamic head (TDH)
  - Net positive suction head available / required
  - System curve(s)
  - Pump performance point
- Anticipated storage time based on average and peak flows including corresponding liquid level
elevations related to the lowest floor
- Anticipated cycle times per hour (initial and full build out)
- Map of design service area and any other lands that are tributary to the pump station
- Demonstrate the ability of the pump station to be upgraded for future expansion.

This hydraulic data shall accommodate the following minimum standards of the Sewer Department:

- The pump station is to be sized to accommodate gravity sewer service for the fully developed
  contributing drainage basin or service basin as determined by the Engineering Department.
- Pump station invert elevations shall comply with the planning goals of the Engineering Department.
- The pump station capacity shall incorporate the following parameters:
  1. Cycle times to be between one (1) start per hour minimum and ten (10) starts per hour
     maximum.
  2. Wet well shall be sized to hold a minimum of two (2) hours of average design flow and one (1)
     hour of peak design flow from "high water alarm" to lowest inflow pipe invert elevation.
- Compliance with the current policies and directives of the Monroe County Health Department, New
  York State Department of Environmental Conservation, New York State Health Department, and
  applicable sections of the "10 State Standards".
- Compliance with the standard details contained herein.

Once the specific hydraulic data has been determined, the developer’s engineer shall submit to the
Town Engineer a report which recommends a specific pumping system based on pump performance
curves and substantial conformance to the preceding "Pump Station and Equipment" specifications.

The report shall be accompanied by a utility plan and profiles which relate all pump station
appurtenances to the proposed development as a whole including any offsite force main locations and
all easements.

7.8 PUMP STATION AND EQUIPMENT
This specification shall govern the furnishing and installing a factory built, submersible duplex pump
station as specified herein and/or as depicted within standard details herein or on project
Site/Utility plans, as necessary for proper and complete performance.

The developer/contractor shall furnish and install a factory built, automatically controlled, above
ground pump station enclosure housing a valve & control package with matching duplex submersible
pumps and associated wet well equipment, capable of pumping raw unscreened sewage or similar
liquids.

The pump control panel, liquid level control, electrical disconnects & transfer switch, electric meter,
wireless telephone dialer, valves and piping shall be installed within a factory built above ground
fiberglass enclosure. Emergency generator connection panel shall be installed through the enclosure
installed within NEMA 1 stainless steel enclosure with dead front door.
The pumps and mechanical slide rail accessories to be installed within the wet well as shown on the standard detail and/or associated project plans.

The piping within the wet well shall include two grooved end pump discharge lines, one grooved end bypass suction line, one grooved end force main connection and one polyvinyl chloride pipe (PVC) Transducer sleeve. All pipe connections within the wet well shall utilize Victaulic type couplers.

Warranty - The pump station manufacturer shall warrant all equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below:

- Fiberglass components of the station enclosure shall be warranted for ten (10) years to resist UV damage, corrosion from moisture or corrosive soils, or physical failures occurring in normal service, without the need for special protective coatings, when installed according to the manufacturer's recommendations.
- The equipment, apparatus, and parts furnished shall be warranted for a period of five (5) years, excepting only those items that are normally consumed in service, such as light bulbs, oils grease, packing, gaskets, 0-rings, etc. The pump station manufacturer shall be solely responsible for the warranty of the station and all components.
- Components failing to perform as specified by the developer's engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer without cost of parts or labor to the Town of Penfield.
- The warranty shall become effective upon the acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment, whichever occurs first.
- In order to unify responsibility for proper operation of the complete pumping station, it is the intent of these Specifications that all system components be furnished by a single supplier (unitary source). The pumping station must be of standard catalog design, totally warranted by the manufacturer. Under no circumstances will a system consisting of parts compiled and assembled by a manufacturer's representative or distributor be accepted.

These specifications and standard details are meant to depict equipment manufactured by The Gorman-Rupp Company. This “SF” – Series station specified herein has been deemed by the Town of Penfield Sewer Department to be most suitable for the anticipated service requirements as well as historical record of reliability of other similar installations.

Note: In certain cases where hydraulic demand and/or pumping capacity exceeds that of a “SF” Series station, the Town of Penfield may opt for a Gorman Rupp – six (6') foot x six (6') foot above ground pump station utilizing “T” Series or “Ultra V” Series self-priming pumps. In this installation all other piping and control considerations shall be the same as or as close to the “SF” Series as practical.

Station Enclosure

The station enclosure shall contain and enclose all valves and associated controls and shall be constructed to enhance serviceability by incorporating the following design characteristics:

- Two access panels per side of station shall be provided. Panels shall be sized and placed to permit routine maintenance operations through the panel openings of the enclosure. For these purposes, routine maintenance shall include frequently performed adjustments and inspections of the electrical components, controls and valves.
- The access panels shall be provided with a hinge and latch. Hinge shall be the continuous type. Latch shall engage the enclosure at not less than three (3) places, and shall be protected by a keyed lock.
- One enclosure side shall contain a screened vent to maximize airflow for enclosure ventilation.
• The station enclosure, less base, must be removable or able to be disassembled following the removal of reusable hardware.
• Removal or disassembly of the enclosure shall be accomplished by not more than two maintenance personnel without the use of lifting equipment.

The station enclosure shall be manufactured of molded reinforced orthophthalic polyester resins with a minimum of thirty (30%) percent fiberglass, and a maximum of seventy (70%) percent resin. Resin fillers or extenders shall not be used.

Station base shall be constructed of pre-cast, reinforced concrete bonded inside a fiberglass form covering top and sides, and shall be designed to insure adequate strength to resist deformation of the structure during shipping, lifting, or handling. The enclosure base shall function at the wet well top and incorporate a duplex access lid, sized for the installation and removal of the specified pumps, and shall be of sufficient size to permit access to the wet well. Color used shall de-emphasize the presence of dirt, grease, etc., and shall be provided with a non-skid surface.

An exhaust blower shall be mounted in the roof of the enclosure. The blower capacity shall be sufficient to change station air a minimum of once every two minutes. The blower motor shall be operated automatically and shall be turned on at approximately seventy (70°F) degrees Fahrenheit and shall be turned off at fifty-five (55°F) degrees Fahrenheit. The blower motor and control circuit shall be protected by a thermal-magnetic air circuit breaker to provide over current and overload protection. The blower exhaust outlet shall be designed to prevent the entrance of rain, snow, rocks, and foreign material.

A static wet well vent shall be mounted in the station base, and be housed in the station enclosure. The station enclosure shall provide a transition area between the wet well and the vent outlet. The vent shall terminate through the station wall with a screened opening, which shall be designed to prevent the entrance of rain, snow, rocks and foreign material.

The station base shall incorporate a cable transition adapter for the pump cables, level controls, and associated wiring. The adapter shall provide for a vapor tight transition between the wet well and the lift station enclosure. The adapter shall incorporate cable grips for each cable and be provided with a gasket between the adapter and the station for a positive seal. Junction boxes shall not be considered for cable transition.

The station base shall be furnished with elastomeric compression sealing devices for all piping penetrations to provide for a vapor tight transition between the wet well and lift station enclosure.

The pump station shall be provided with a fifteen hundred (1500W) watt, one hundred fifteen (115V) volt electric heater with cord, thermostat and grounding plug. Ungrounded heaters shall not be acceptable.

The pump station shall be equipped with a one (1") inch thick closed cell foam insulation, which shall be applied to the roof, doors, and corner panels.

Pump station shall be supplied with a thermostat, which shall monitor interior station temperature. The control shall incorporate a control relay and an unpowered dry contact wired to terminal blocks for field connection to a remote alarm device in the event that the temperature within the enclosure falls below a preset point between thirty-five and one hundred (35-100°F) degrees Fahrenheit.
A. General
The pump must have the necessary characteristics and be properly selected to deliver flow at a design dynamic discharge head as specified in the developer’s engineered design report.

B. Hydraulic Components and Solids Handling
The pump casing shall be of gray iron with a gray iron or ductile iron slide rail guide shoe attached to the discharge flange as an integral assembly. Casing shall be easily removable from the motor for full inspection of impeller.

All pump openings and passages shall be of adequate size to pass a three (3”) inch diameter spheres (minimum) and any trash or stringy material which can pass through an average house collection system. The impeller shall be recessed into the pump casing and shall not require flow of liquid through the impeller. The impeller and seal housing shall incorporate auxiliary vanes to hydraulically reduce pressure on the primary seal and force fibrous materials and solids away from the close axial clearance on the backside of the impeller. No impeller clearance adjustment or wear rings shall be required.

The impeller shall be a multi-vane vortex type with integral winglets on each vane. The winglet shall form an L-shaped cross section at the face of the vane for improved hydrodynamic efficiency. The impeller shall be of ductile iron and precision balanced. Balancing shall not deform or weaken the impeller. The impeller shall have a tapered locking fit onto the shaft and further be secured by a key and locking bolt. Impeller fasteners shall be non-corroding.

C. Shaft Seal
The pump shaft shall be sealed against leakage by a mechanical seal. The lower wearing faces shall be silicon carbide. The upper faces shall be carbon and hardened stainless steel. Elastomers shall be viton.

D. Pump Motor
Motor Description:
- The submersible pump motor shall be three (3) phase one hundred twenty (120V) volt and two hundred forty (240V) volt compatible and operate in accordance with the electrical power indicated above. The motor and pump must be connected to form an integral unit. The motor shall be a squirrel-cage, induction type, in an air-filled watertight enclosure. The motor shall conform to NEMA design Class B, and incorporate Class F insulation materials to withstand a continuous operating temperature of three hundred eleven (311°F) degrees Fahrenheit. The pump and motor shall be capable of handling liquids with a maximum temperature of one hundred and four (104°F) degrees Fahrenheit.
- Motor shall be capable of sustaining a minimum of ten (10) starts per hour. The motor shall operate while only partially submerged and not require a cooling jacket or any other means of auxiliary cooling during normal continuous operation.
- Motor housing shall be of cast iron. The stator shall consist of copper windings with copper connectors applied to high grade electrical steel laminations. The stator shall be held securely in place by a heat-shrink fit into the motor housing. Any other means of securing the stator, which would require penetration of the motor housing, shall not be considered acceptable.
- Rotor shall be solid cast and dynamically balanced for vibration-free operation. Rotor end bars and short circuit rings shall be of aluminum. The pump shaft shall be of AISI Type 329 stainless steel (or hardened alloy steel with protective stainless steel shaft sleeve, which prevents contact of the shaft with the liquid). The shaft shall be machined with shoulders or snap ring grooves for positive placement of bearings. The upper and lower bearing shall be of heavy duty design, capable of supporting the shaft and rotor while under maximum radial and thrust loads. The bearings shall be permanently grease lubricated and sealed at the time of installation.
Watertight Integrity:

- All static seals at water tight mating surfaces shall be of nitrile "O" ring type. Use of auxiliary sealing compounds shall not be required. The power and control cables shall enter the motor through a terminal housing. The entrance shall be sealed with a rubber grommet and clamp set which when compressed longitudinally causes a radial water tight seal. The clamp set shall prevent all slippage and rotation of cable while engaged, yet may be easily removed and reused during routine maintenance. Any other cable entrance design requiring use of epoxies, silicones, or similar caulking materials shall be considered unacceptable.
- The pump and electrical cables shall be capable of continuous submergence without loss of waterproof integrity to a depth of sixty-five (65') feet.
- The water tight integrity of the motor housing and shaft seal shall be tested during the manufacturing process by pressurizing the motor cavity and submerging in water with the motor operating.

Motor Protection:

- The motor shall be protected from thermal and moisture damage. Thermal protection shall consist of three separate thermostatic switches embedded into the stator windings. Any moisture in the motor housing shall be detected by a mechanically activated moisture sensing micro-switch. The switch shall be sensitive enough to detect airborne moisture and terminate operation of the motor before liquid enters the cavity. Use of probes or floats that rely on the presence of liquid to initiate signal shall not be considered acceptable.

Valves and Piping (Enclosure)

Each pump shall be equipped with a full flow type check valve, capable of passing a three (3") inch spherical solid, with flanged ends and be fitted with an external lever and spring. The valve seat shall be constructed of stainless steel and shall be replaceable. The valve body shall be cast iron and incorporate a three (3") inch diameter cleanout port. The valve clapper shall have a molded neoprene seating surface incorporating low pressure sealing rings.

Each discharge line shall be equipped with a two (2) way plug valve to permit isolation of the pumps from the common discharge header. The plug valve shall be a non-lubricated type. The valve body shall be semi-steel with flanged end connections drilled to one hundred twenty-five (125 lb.) pound standard.

Emergency bypass pump connections shall be provided and shall include two (2) way plug valves located in the fiberglass enclosure and quick connect fittings which shall terminate outside the fiberglass enclosure.

The flanged header pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and Class 53 thickness.

Flanges shall be cast iron Class 125 and Comply with ANSI B16.1.

Pipe and flanges shall be threaded and suitable thread sealant applied before assembling flange to pipe.

Bolt holes shall be in angular alignment within one-half (1/2°) degrees between flanges. Flanges shall be faced and a gasket finish applied.

Valves and Piping (Wet well)

Station piping within the wet well shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and Class 53 wall thickness. Piping shall be supplied with factory milled grooved ends,
suitable for use with Victaulic or similar style thrust restrained fittings typically used in the Fire Protection industry.

Pump discharge piping shall be braced at the midpoint between the discharge connection and the station floor. The brace shall consist of a steel riser clamp and three-quarter (3/4") inch stainless steel threaded rod hardware. The rod shall be fastened to the wall with lead split anchors.

Suction piping for the temporary bypass pump shall be braced in similar fashion as above, but shall be braced every six (6') foot on center.

The transducer sleeve shall be two (2") inch SDR-21 polyvinyl chloride pipe (PVC) (continuous length). The pipe shall be continuous from the termination point twelve (12") inches above the wet well floor to the upper termination point. The pipe should also be braced with split ring clamps and stainless steel threaded rod to the wet well wall. Bracing shall be spaced no greater than every six (6') feet along its vertical length. Sleeve shall have a one-quarter (1/4") inch stainless steel pin or bolt through the bottom for the transducer to rest on.

**Submersible Discharge Connection**

Each pump shall be furnished with a submersible discharge connection system to permit removal and installation of the pump without the necessity of an operator entering the wet well. The design must insure an automatic and firm connection of the pump to the discharge piping when lowered into place.

A gray iron or fabricated steel base plate with integral guide rail pilots shall be provided along with all hardware and anchor bolts required for permanent installation to the wet well floor. The base plate shall be designed with an integral ninety (90°) degree elbow, or adapt to a commercially available elbow for connection to the vertical discharge piping utilizing standard ANSI one hundred twenty-five (125 lb.) pound flanges.

Each pump shall be provided with a replaceable ductile iron slide rail guide shoe attached to the pump discharge flange. A replaceable neoprene seal shall be provided as an integral part of the guide shoe to form a seal with the base plate connection and eliminate the possibility of leakage and erosive wear during operation. The seal shall contact mating faces in a static position and shall have adequate flexibility to flex under pumping pressure to increase seal efficiency. Metal-to-metal contact at the discharge connection shall not be acceptable.

The site contractor shall be responsible to provide two (2) lengths of one and one-half (1 ½") inch schedule 40 stainless steel guide rail pipe for each pump.

The guide shoe shall direct the pump down two vertical guide rails and onto the discharge connection in a simple lineal movement. The buildup of sludge and grease on guide rails shall not present problems during the lifting operation. The guide shoe shall be designed with integral hooks at the top to transmit full weight of the pump to the base plate flange. No portion of the pump shall be supported directly on the bottom of the wet well, guide rails, or lifting cable.

**Wet Well**

The wet well Structure shall consist of pre-cast concrete manhole barrel sections capable of supporting H-20 Highway Loading.

1. The top barrel section shall be flat without the keyway for subsequent riser sections. This is to provide the maximum flat wall thickness for the station floor to sit upon.
2. The barrel sections shall be coated inside and out with Bitumastic coating.
3. Barrel joints shall be sealed tightly against groundwater infiltration. The Wet Well shall be vacuum tested as is specified within the sanitary sewer manhole testing portion of this
specification.

4. The wet well shall be ordered without manhole stairs.

The enclosure shall sit directly on top of the last barrel section. A double row of rubberized mastic shall be placed between the top barrel section and the underside of the pre-cast station floor. Extreme care should be taken to carefully plan the orientation of the pump station unit so as to properly align with pump rails and piping.

The wet well access shall be fabricated from welded aluminum sections. A hinged aluminum door shall be provided for each pump. The hinged door shall be fabricated from one-quarter (1/4") inch thick aluminum with non-skid diamond tread on upper surface. All hardware on access assembly shall be stainless steel with a flush upper surface without protrusions. For safety, the door shall have a load rating of three hundred (300 psf) pounds per square foot and be fitted with a recessed staple for padlock. The door shall be furnished with a flush aluminum drop handle and automatic hold open arm.

Pump lifting cable shall consist of a stainless steel braided wire cable attached to the pump lifting bail, and stored on a stainless steel hook attached to the inside wall of the hatch.

All bolts, machine screws, nuts, washers, and lock washers for complete assembly of access cover, guide rails, and discharge elbow shall be stainless steel.

Station Controls
The electrical control equipment shall be mounted within a thirty-six (36") inch x thirty (30") inch x fourteen (14") inch NEMA 1 stainless steel, dead front type control enclosure. The enclosure door shall be hinged and sealed with a Neoprene gasket. It shall include a removable plated steel back panel on which control components shall be mounted. The back panel shall be secured to enclosure with collar studs. Operator controls shall be mounted on the enclosure door. The enclosure shall be mounted within the fiberglass valve enclosure. The control panel shall be equipped with vapor emission type corrosion inhibitors.

Each pump shall have an open frame, across-the-line, NEMA rated magnetic motor starter. All motor starters shall be equipped to provide under voltage release and overload protection on all three phases.

Overload relays shall be block type, and shall be manual reset only. Trip setting shall be determined by heater element only and not by adjustable settings.

A properly size heavy duty air circuit breaker shall be furnished for each pump motor. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering. A pad locking operating mechanism shall be installed on each motor circuit breaker. Operator handles for the mechanism shall be located on the exterior of the control compartment door, with interlocks which permit the door to be opened only when the circuit breakers are on the off position.

A duplex ground fault indicating utility receptacle providing one hundred fifteen (115V) volt, sixty (60Hz) hertz, single phase current shall be mounted on the side of the control enclosure. Receptacle circuit shall be protected by a fifteen (15A) ampere thermal magnetic circuit breaker.

The control panel shall be equipped with circuitry to override the level control system and shut down the pump motor(s) when required to protect the pump(s) from damage caused by excessive temperature. A thermostat shall be mounted on each pump to detect its temperature and a magnetic switch shall be supplied for each thermostat. An indicator, visible on the front of the control panel shall indicate the pump motor has been stopped because of high temperature conditions. The pump(s) shall remain locked out until it has cooled and the circuit has been manually reset.
The control panel shall also be supplied with HOA switches, alternator relay, pump run indicators, elapsed time indicators, and a sequence selector switch.

The control panel shall be equipped to monitor the incoming power and shut down the pump motors when required to protect the motor(s) from damage caused by phase reversal, phase loss, low voltage, and voltage unbalance. A time delay shall be provided to minimize nuisance trips. The motor(s) shall automatically restart when power conditions return to normal.

The control panel shall be equipped with a secondary lightning arrester to minimize damage to the pump motors and control from transient voltage surges. The arrester shall utilize silicon-oxide varistors encapsulated in a non-conductive housing. The arrester shall have a current rating of sixty thousand (60,000A) amperes, and a Joule rating of one thousand five hundred (1500J) joules.

A. **Level Control**
   - The level control system shall start and stop the pump motors in response to changes in wet well level, as set forth herein.
   - The level control system shall be capable of operating a submersible transducer type system, or ultrasonic transmitter type system.
   - The level control system shall utilize the alternator relay to select first one (1) pump to run as lead pump, then the second pump to run as lag pump for a pumping cycle. Alternation shall occur at the end of a pumping cycle.
   - The level control system shall utilize an electronic pressure switch, which shall continuously, monitor the wet well level, permitting the operator to read the wet well level at any time. Upon operator selection of automatic operation, the electronic pressure switch shall start the motor for one pump when the liquid level in the wet well rises to the "lead pump start level". When the liquid is lowered to the "lead pump stop level", the electronic pressure switch shall stop this pump. These actions shall constitute one pumping cycle. Should the wet well level continue to rise, the electronic pressure switch shall start the second pump when the liquid reaches the "lag pump start level" so that both pumps are operating. These levels shall be adjustable as described below.
     1. The electronic pressure switch shall include integral components to perform all pressure sensing, signal conditioning, EMI and RFI suppression, DC power supply and one hundred twenty (120V) volt outputs. Comparators shall be solid state, and shall be integrated with other components to perform as described below.
     2. The electronic pressure switch shall be capable of operating on a supply voltage of twelve (12VDC) volts DC in an ambient temperature range of fourteen through one hundred thirty-one (14-131°F) degrees Fahrenheit. Control range shall be zero to twelve (0-12.0') feet of water with an overall repeat accuracy of (plus/minus) one-tenth (0.1') of a foot of water. Memory shall be retained using a non-volatile lithium battery back-up.
   - The electronic pressure switch shall consist of an integral pressure sensor, display, electronic comparators, and output relays.
     1. The internal pressure sensor shall be a strain gauge transducer, which shall convert the input to a proportional electrical signal for distribution to the display and electronic comparators. The transducer output shall be filtered to prevent control response to level pulsations.
     2. The display shall be an LCD back lighted panel. It shall indicate level in the wet well and the selected operating and alarm levels. It shall be calibrated to read feet of water, be accurate to one-tenth (0.1') of a foot and have a full scale indication of twelve (12') feet.
     3. Level adjustments shall be electrical comparator set points to control the system. The levels shall be easily adjustable by membrane type switches. Systems requiring hard wiring, electronic test equipment, introduction of pressure, artificial level simulation, or opening of any cover panel for adjustment are not acceptable. The selected levels shall be viewable by the operator on the display.
4. Each output relay shall be solid state, individually fused and be optically isolated from its output. The “on” state of each relay shall be indicated by a light emitting diode. The output relays shall have an inductive load rating equipment to one (1) NEMA size four (4) contactor.

- The electronic pressure switch shall be equipped with an output board, which shall include LED status indicators and a connector with cable for connection to the main unit.
- The electronic pressure switch shall be equipped with pump start delay(s) preset at a fixed delay time of five (5) seconds.
- Circuit design in which application of power to the lag pump motor starter is contingent upon completion of the lead pump circuit shall not be acceptable.
- The electronic pressure switch shall be equipped with a simulator system capable of performing system cycle testing functions.
- The electronic pressure switch shall be capable of controlling liquid levels in either a pump up or pump down application.
- The electronic pressure switch shall be equipped with a security access code to prevent accidental set-up changes and provide liquid level set-point lock-out.
- The electronic pressure switch shall be equipped with one (1) zero to thirty-three (0-33’) foot water column input, one (1) scalable analog input of either zero to five (0-5VDC) volt DC, zero to ten (0-10VDC) volt DC, or four to twenty (4-20mA) milliampere, and one (1) scalable analog output of four to twenty (4-20mA) milliampere. Output is powered by a ten (10VDC) volt DC supply. Load resistance for a four to twenty (4-20mA) milliampere output shall be between one hundred and four hundred (100-400Ω) ohms.
- The electronic pressure switch shall include a DC power supply to convert one hundred twenty (120VAC) volt AC control power to twelve (12VDC) volt DC EPS power. The power supply shall be a five hundred (500mA) milliampere, six (6W) watt minimum and be UL listed Class two (2) power limited power supply.
- The electronic pressure switch shall be contained within a NEMA 4X enclosure including a polycarbonate face and stainless steel case.
- The electronic pressure switch shall be equipped with an electronic comparator and solid state output relay to alert maintenance personnel to a high liquid level in the wet well. An indicator, visible on the front of the control panel, shall indicate that a high wet well level exists. The alarm signal shall be maintained until the wet well level has been lowered and the circuit has been manually reset. The high water alarm shall be furnished with a dry contact wired to terminal blocks.

B. Submersible Transducer System

- The level control system shall utilize a submersible transducer. It shall be a strain gauge transducer with a pressure sensor housed in an AISI Type 316 stainless steel case designed to extend into the wet well. The pressure transducer shall provide a proportional signal for distribution to the display and electronic comparators of the electronic pressure switch, and remainder of the level control system. Sensor range shall be zero to twelve (0-12’) feet water column minimum with an over-pressure rating three (3) times full scale. The transducer shall have output capability of one and one-half to seven and one-half (1.5-7.5VDC) volts DC or four to twenty (4-20mA) milliampere.
- The transducer's polyurethane jacketed shielded cable shall be of suitable length for proper installation into the wet well without splicing and shall be installed into the two (2”) inch polyvinyl chloride pipe (PVC) Transducer sleeve.
- An intrinsically safe repeater shall be supplied in the control enclosure. Repeater must be recognized and listed as intrinsically safe by a nationally recognized testing laboratory. The station manufacturer shall make all connections from repeater to feeder lines and motor controls. The installing contractor shall make connections from repeater to transducer.
**Backup Generator**

A backup generator shall be provided and installed adjacent to each pump station to maintain electrical functionality in the event of a power outage.

The generator shall be sized appropriately to provide enough power to maintain the pump station’s operation under full load.

The generator shall be housed in an outdoor sound attenuated enclosure approved by the Director of Public Works. A block heater and battery tender shall also be installed within the generator enclosure.

The enclosure shall utilize a keyed lock to restrict access.

Accommodations shall be made to connect the generator to the web-based pump station monitoring system’s alarm inputs.

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**Web-Based Pump Station Monitoring System “Cellular Telephone Dialer”**

**A. General**

1. A web-based pump station monitoring system “wireless telephone dialer” shall be mounted within the fiberglass enclosure and wired to the pump control panel to monitor all alarm conditions.
2. Unit shall be an Omni-Site XR-50 (latest version) compatible with existing Omni-Site units in use by the Town of Penfield.
3. Unit shall be housed in a weatherproof NEMA 4X enclosure.

**B. Cell Service**

The supplier will include three (3) years of prepaid cellular service and web based connectivity in their price which includes all specified lift station daily reports and alarm notifications. Website updates will be included at no additional cost to the client during this three (3) year period. There shall be no additional charges of any kind to the Town of Penfield.

**C. Programming**

1. The device shall be configured, programmed, and setup using any standard Internet web browser software.
2. All connected equipment can be monitored and configured from anywhere in the world using the internet.
3. Password protected screens provide secure access.
4. Proprietary programming software or skills shall not be required.

**D. Communication**

1. Communication shall be via cellular modem using the AMPS analog or digital control channel Spectrum having a three (3W) watt rating.
2. Provide a factory mounted, low profile, secure mount phantom antenna.
3. Inquiry phone calls can be made via a toll free phone number to receive a current status report of all alarms and to acknowledge any current alarms.
4. Device shall have capability of being positioned anywhere in the US at any time without coordination with the local or long distance telephone companies.
5. The device shall not incur long distance telephone charges.
6. No landline phone lines or radio propagation studies shall be required.
E.  Alarming and Monitoring
1. The device shall monitor connected alarms and analyze and report the following information with alarm notifications sent immediately, or at user selectable time delays, and daily time scheduled reports of the following:
   - High water alarm (From level controller)
   - Power failure alarm
   - Pump flow rate, Pump #1 & #2, GPM
   - Combined pump flow rate, GPM
   - Wet well inflow rate
   - Total station daily flow, Gallons
   - Pump #1 & #2 on/off cycles
   - Pump #1 & #2 runtimes
   - Combined pump runtime
   - High pump temperature alarm, Pump #1 & #2
   - Daily time stamps when minimum and maximum inflow occurred
   - Average daily inflow
   - Cellular signal strength
   - Historical log showing alarm history
   - Graphing of historical data exportable to Microsoft Word or Excel
   - Crew on-site notification alert
   - Low battery back-up alarm
   - Station enclosure low temperature.
2. Alarm notification: Operator programmable using voice call or email.
3. Contact List: Operator programmable, upon alarm activation, the system shall selectively contact the configured recipient list according to the current alarm(s).

F.  Power Supply
1. Incoming electrical service shall be one hundred fifteen (115VAC) volts AC, sixty (60Hz) hertz, single-phase power.
2. Fuse protected twelve (12VDC) volts DC power supply shall be powered from the one hundred twenty (120V) volt incoming power and shall include tapered charge type battery circuitry to maximize battery life. The power supply shall be rated at minimum two (2A) amperes at twelve (12VDC) volts DC.
3. Provide a twelve (12V) volt battery charging power supply and battery backup with a thirty-six (36) hour minimum operation time.

G.  Protection
1. Single-phase lightning arrester connected to each line of the incoming side of the power input terminals. Alarm contacts shall utilize transient protectors, four thousand (4000V) volt optical isolators.
2. The contractor shall provide a good electrical ground connection point.

Delivery & Examination
Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Station manufacturer shall provide written instruction for proper handling. Immediately after off-loading, contractor shall inspect complete pump station and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all station serial numbers and parts lists with shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.
**Installation**
Install, level, align, and lubricate pump station as indicated within these specification and as shown in the Standard Details on the project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.

Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.

Prior to applying electrical power to any motors or control equipment, check all wiring for tight connection. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.

Station start-up shall be witnessed by the station manufacturer or their authorized representative. This start-up procedure shall include verification that electrical equipment, piping and valving is functioning as designed and that the pumps are running at the designed point on the system head curve. Following start-up, the manufacturer or their authorized representative shall produce a written report of the start-up procedure.
SECTION 8 - STORM DRAINAGE SYSTEMS

8.1 DESIGN CRITERIA
This section is to provide guidance for the design of storm drainage facilities. These facilities shall be designed to collect and transport the run-off from streets, lawns, paved areas, roof areas, and upstream areas.

The storm sewer system must comply with all requirements of the following:
- Local Law No. 4 of 2000 entitled “Town of Penfield Stormwater and Erosion Control Law”
- Town of Penfield Stormwater Management Policy
- NYSDEC Stormwater Management Design Manual
- Irondequoit Creek Watershed Collaborative’s Recommendations for Comprehensive Stormwater Management
- Local Law No. 3, 4, & 5 of 2007.

All storm sewers must be hydraulically sized by any generally accepted practice to facilitate the conveyance of stormwater so that stagnation, ponding, and backwatering of and within the system do not occur. The storm sewer pipes shall be based upon a design flow with the minimum return interval of ten (10) years. The design flow for all pipes shall not exceed eighty (80%) percent of the capacity of the pipe when flowing full. The minimum velocity for all storm sewers shall be three (3 fps) feet per second when flowing full. Time of concentration to first inlet shall be taken as not less than five (5) minutes and not more than fifteen (15) minutes. Analysis of the time of concentration shall be submitted to the town for review and approval.

All pipe shall be laid in accordance with the approved plans line and grade, with uniform bearing under the full length of the barrel of the pipe. Suitable excavation shall be made to receive the socket or collar, which shall not bear upon the subgrade or bedding. Any pipe that is not in true alignment or shows any undue settlement shall be replaced at the contractor’s expense.

Pipe sections shall be laid and jointed in such a manner that the offset of the inside of the pipe at any joint will be held to a minimum at the invert. The maximum offset at the invert shall be one (1%) percent of the inside diameter of the pipe or three-eighths (3/8”) inch, whichever is smaller.

The engineer shall submit a copy of all calculations, input data, and analysis results for review.

The design of natural watercourse channels and their culverts under dedicated and private roads shall depend upon the drainage area according to the following table:

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Recurrence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>above 20 square miles</td>
<td>100 year</td>
</tr>
<tr>
<td>between 4 to 20 square miles</td>
<td>50</td>
</tr>
<tr>
<td>year less than 4 square miles</td>
<td>25</td>
</tr>
</tbody>
</table>

Storm sewers and channels shall be designed to adequately convey the anticipated runoff from the development, as well as all contributing area upstream or uphill from the development in question.

The minimum size piping used for storm drains shall be twelve (12”) inches in diameter; except that catch basin crossovers shall be a minimum of eight (8”) inch diameter piping.
Open channels serving as main drainage ways may be accepted by the town where, by engineering design, it has been established that the future flow (under conditions of full development) could be contained within the channel limits and appropriate buffers (see EPOD regulations) are provided to adjoining structures. The side slopes of open channels shall be designed and graded to minimize erosion and scour. This will require the removal of vegetation within the flow area of the channel. Where adequate buffer cannot be provided the drainage course shall be enclosed. Where open channel crosses developed lands, the town may require a six (6") inch thick concrete gutter of adequate width, based on required capacity of the drainage way, to substantially contain flows. The concrete gutter shall be constructed as per the standard details provided herein. The developer’s engineer bears the responsibility of providing technical design data for all conveyance systems, which shall be submitted to the Town Engineer for approval.

The developer’s engineer shall design the vertical control of their subdivision so that surcharge of storm drainage systems will not cause a backup or flooding of cellars. This will require that cellar drains not be connected to the storm drainage system unless (a) the cellar floor is higher than pavement grade in order that the street drainage system can run fully surcharged or (b) that cellar drainage discharges through a sump pump and check valve.

In the design of storm drainage piping systems, a Manning coefficient "N" of 0.013 shall be used for smooth pipe and an "N" of 0.024 shall be used for corrugated metal pipe, unless the corrugated metal pipe has an approved "smooth" lining where an "N" of 0.013 may be used. Smooth flow corrugated plastic pipe shall have an “N” of 0.012.

Where open swales or creeks are involved, the banks shall be constructed with slopes no steeper than one (1) horizontal on three (3) vertical. If for any reason this cannot be achieved, the watercourse shall be piped. The side slopes shall be protected with a geotechnical fabric designed for the anticipated channel velocities.

Storm sewer piping along the side or rear of a structure shall be extended past the proposed residence or structure in conformance with the following criteria:
- All existing open drainage swales shall be piped to a point that is a minimum distance of one hundred forty (140') feet measured perpendicular from any point on adjacent setback lines.
- Provide piping one hundred (100') feet from the end section to the rear of the structure, including garage.

8.2  ACCOMMODATIONS FOR HOUSE AND LOT STORM DRAINAGE

In general, provisions shall be made for positive drainage at each lot through the installation of properly graded swales, ditches, and drains. Finished ground level adjacent to roadside house foundation wall shall be a minimum of one (1') foot higher than the edge of pavement or shall provide a minimum slope of two (2%) percent away from the foundation to a swale, culvert, or other collection system. These improvements shall not negatively impact adjoining property owners. These items shall receive the same careful design attention as the street drainage system.

Walkout basements shall be noted on the site plans and in conformance to these specifications. Where a walkout basement is not noted, the builder shall provide a lot grading plan for the proposed lot to be reviewed and approved by the Town Engineer prior to issuance of a building permit.

Provisions shall be made for disposing of roof and cellar drainage into the street drainage system. This shall be accomplished with the use of storm sewer laterals. When positive discharge from the cellar drain cannot be obtained, sump pumps with appropriate check valves shall be installed. Roof
runoff MAY be disconnected from the storm lateral to comply with Green infrastructure practices when
designed in accordance with the latest version of the NYSDEC Stormwater Design Manual, and with the
acceptance of the Town Engineer. The decision to allow downspouts directed to splashblocks will be
based on existing soil conditions, the size of the parcel, the proposed slopes of side yard swales and
compliance with the Town of Penfield’s Drainage Laws. Where storm sewers are not available, roof and
cellar drainage shall be discharged to splash blocks. At no point shall a downspout or sump pump
discharge closer than five (5’) feet from any property line, and shall not cause water to impact the
adjacent property. Sump pump discharges shall always be connected to the storm sewer system if it is
available.

No laundry, sanitary, or kitchen wastes shall be discharged to the storm drainage system or to grade. No
drain connections from garage floors shall be permitted to enter drainage swales or storm sewers.

Basements shall be installed with a minimum of eight (8") inches of crushed stone beneath the slab.
Sump pumps shall be installed in crocks with perforations the full height. Storm drain laterals shall be
installed within ten (10’) feet of the outside face of the building, at bends, and at spacing not to exceed
seventy-five (75’) feet on center.

All primary yard swales (side and rear lot lines) shall have a minimum grade of two (2%) percent. Where
this cannot be provided, a concrete gutter or pipe with field inlets is required.

Yard inlets shall be provided along swales to collect runoff from a maximum distance of three (3) lots or
four hundred (400’) feet (in any direction), whichever is less.

8.3 STORMWATER MANAGEMENT FACILITIES
Stormwater management facilities, Green Infrastructure, sedimentation basins, and erosion control
measures in all new land development shall be provided where, in the judgment of the Town Engineer, it
is felt necessary in order to provide proper drainage and/or erosion control.

The Town of Penfield requires that all development consolidate the stormwater control facilities into one
location. The facilities shall be situated on the site to minimize any detrimental impacts to adjoining
property owners. The site shall allow access for town staff and equipment for inspection and routine
maintenance along the entire perimeter and to a public right-of-way.

Commercial treatment facilities shall be owned and maintained by the developer/owner. A maintenance
agreement is required prior to the Certificate of Occupancy.

The minimum horizontal separation from a foundation wall to the high water level of a stormwater
management facility shall be one hundred (100’) feet to existing and proposed residential properties.

Plan view, profiles and details are required to show the pond location, size, inlet structures, and outlet
structures as well as any appurtenances. In designing the stormwater management facility, attention
shall be given to the types of soils found in the site. The town may require that the pond bottom be lined
or constructed of impervious soils or manufactured sealants to prevent seepage or piping of stored water
along the underlying bedrock. The town may require the developer to provide a soils report done by a
professional soils engineer to determine if the on-site material meets the requirements for infiltration
capacity or as a pond liner.

The ownership of all residential stormwater control facilities shall be by an individual property owner, a
Home Owners Association (HOA) or the Town of Penfield with a Special Improvement District that is
created for the development. A drainage inspection easement shall be provided to the Town of Penfield
that allows full access to the facility for inspection and emergency services. Said easement shall extend
horizontally a minimum twenty-five (25') feet from the high water elevation.

- Stormwater management facilities shall be required to reduce the peak rate of runoff for all design year storms to eighty (80%) percent of the pre-development condition or to the capacity of the receiving culvert (whichever is less) to account for winter conditions.

The design engineer shall consult with the town’s watershed drainage studies to determine any downstream restrictions. The town reserves the right to establish other more restrictive parameters to address these restrictions, known areas of flooding, or other existing drainage problems.

Where on site detention/retention is not desired, the developer shall submit the equivalent fees, as determined by the Town Engineer, for their share of any future off-site facilities or improvements.

All outlet control facilities shall have a two (2') foot graduated scale to show the depth of water above the normal pool elevation. This scale shall be visible from the access path of the facility or the nearest right-of-way.

**8.4 ENGINEERING PROCEDURES**

In order to arrive at an engineering estimate of storm flows and proposed detention pond size, the engineer should proceed according to the steps listed herein.

The design of storm sewers, stormwater treatment facilities, and Green Infrastructure shall be based upon standard engineering design practices. All computer generated designs shall include a copy of the manual and/or the actual program to the Engineering Department. All input data and output results shall be submitted in the Engineer’s Report, including, but not limited to the following:

- Drainage area watershed map
- Soils map
- Time of concentration calculations
- Pipe flow calculations
- Treatment Facility calculations
- Receiving pipe(s) capacity analysis
- Downstream channel capacity analysis
- Any additional information as requested by the Engineering Department
- **Green infrastructure calculations**

The engineer shall design the stormwater facility in accordance with the following regulations:

- All detention/retention facilities shall be designed to mitigate the impacts of a two (2) year, ten (10) year, and twenty-five (25) year design storm. The design report shall address the impacts of the fifty (50) year and one hundred (100) year design storm.
- All ponds shall have an emergency spillway designed such that a one hundred (100) year storm can be routed through the pond without overtopping the banks.
- Requirements of the New York State Department of Environmental Conservation shall be considered and shall be used in cases where they are more stringent than these regulations.

The developer’s engineer shall use existing topographic maps and the appropriate rainfall frequency to determine the minimum expected natural rate of runoff for the design storms from an undeveloped site. Factors affecting this rate include slope of land, surface cover, area of drainage basin and the presence or lack of well-defined natural channels. This rate of runoff shall be the controlling allowable discharge from any development in the area under question for the given design storm. If downstream sewers, culverts or channels have a capacity of less than the proposed rate, this downstream capacity shall control as the allowable discharge rate. The runoff coefficient for developed conditions shall be a weighted number based upon area of impervious surfaces.
Design of the outlet structure shall allow access for town and emergency staff at all times. Plans shall note the stage storage data for all design year storms.

8.5 FLOOD HAZARD PREVENTION
Flood hazard prevention shall include the control of soil erosion of land surface and drainage channels and the prevention of inundation and excessive ground water seepage by comprehensive site grading and the establishment of adequate elevations of buildings, building openings and roadways above the observed, anticipated or computed water levels of storm sewers, streams, channels, flood plains, detention basins and swales.

Particular attention shall be paid to development in the vicinity of Irondequoit Creek, Allen’s Creek and their flood plains. No alteration of the existing characteristics of the area shall take place without the specific approval of the regulatory agency and the Town Engineer as to the adequacy of the protective measures taken, if any. The effects of such development on upstream and downstream reaches of the watercourses, as well as adjacent properties, shall be defined by the applicant.

All development proposed within the Special Flood Hazard Area as defined by the Federal Insurance Administration shall comply with the various regulations set forth by the Federal Insurance Administrator and the Town of Penfield.

Any filling within a flood plain shall be compensated with an excavated area that is within or adjacent to the floodplain that is one and one-quarter (1.25) times the volume filled within the designated flood plain. The compensatory storage area shall be located in an area adjacent to the affected flood plain.

8.6 EROSION CONTROL
A. General
In order to ensure that the land can be developed without danger of flooding or erosion of downstream areas, the town shall require the developer to follow standard erosion control practices. The Town Engineer shall verify that the required procedures are being put into practice. Such procedures may include:

- Exposing the smallest practical area of land at any one time during development;
- Installation of temporary vegetation and/or mulching to protect critical areas as soon as grading is complete;
- Installation of adequate drainage facilities to accommodate the increased runoff caused by changed soil and surface conditions during and after development. The developer’s engineer shall show, as part of their submitted plans, the interceptor swales and sedimentation basins along the lower edges of all developments. Significant topographic data and design grades for the swales shall be shown on the plans;
- Fitting of the development plan to the topography and soils so as to minimize the erosion potential;
- Retention and protection of natural vegetation wherever possible;
- Installation and maintenance of, interceptor swales, erosion fencing, sedimentation basins or check dams to intercept silt laden runoff;
- Installation of adequate protective measures when slopes in excess of one on three (1:3) are graded; and minimizing such steep grading. This shall include geotextiles with organic material matting;
- Installation and maintenance of geotextile fabrics over catch basin, yard inlets, or outlet structures;
- Installation of other protective measures for as required by the Town Engineer.

B. Design and Implementation
The design and details shall be shown on the approved grading plan and consist of, but not limited to silt fence, check dams, sediment basins, a stabilized construction entrance, and other approved measures.
The Town Engineer, or other field representative, reserves the right to modify these erosion control measures, if deemed necessary. Adequate funds shall be held in the Irrevocable Letter of Credit to assure that these systems are installed and maintained during the completion of all site work.

The design of an erosion control plan shall be in accordance with "Guidelines for Urban Erosion and Sedimentation Control" published by the NYS Chapter of the Soil and Water Conservation Society. The Town Engineer, or Authorized Official, reserves the right to modify or order periodic maintenance of said erosion control measures.

If it is determined by the Town Engineer or other Authorized Official, that any part of the erosion control plan has not been implemented, the Town of Penfield may place a STOP WORK ORDER on the project, until the deficiency has been brought into conformance. The Stop Work Order can then be lifted only when the issuing Authorized Official is satisfied that the site has been brought back into compliance and the non-compliance with the approved site plans has been properly corrected.

If any portion of the erosion control devices fail, causing downstream siltation, the developer shall bear the cost for any associated clean up or removal of silt from drainage ways, culverts, or ponds. The Town of Penfield will reserve the right to hold contingency money to insure proper remediation.

The developer is responsible to ensure that all sedimentation and erosion control features are inspected in accordance with their SPDES permit. Copies of all inspection reports shall be submitted to the Town Engineer within 48 hours of the inspection.

The developer and the contractor shall maintain erosion control measures throughout the construction of the site to minimize siltation of stormwater control facilities. The Engineering Department may require that the contractor clean all facilities of sediment prior to final acceptance. Funds to insure this work is done shall be included in the last phase of a project.

Any deficiencies noted in an inspection report shall be repaired or remedied within forty-eight (48) hours of the date of the inspection.

8.7 DESIGN REQUIREMENTS
A. General
In designing the sewer profiles, consideration must be given to insure that all laterals can be installed at a minimum pitch of one-eighth (1/8") inch per foot.

Sewers shall be designed with straight line grade and alignment between manholes. Manholes shall be placed at intervals of not more than four hundred (400') feet. Sufficient grade of the pipe shall be provided to maintain a minimum velocity of three (3 fps) feet per second to prevent settling of grit. Manhole tops shall be installed to conform to the finished grade. Sewers and manholes shall not extend within the base of pavement or gutters.

All three-way manholes shall be five (5') feet in diameter or greater depending on size of pipes. The invert of a three-way manhole will have a minimum radius equal to one-half (1/2) the diameter of the manhole. No "T" intersections will be accepted.

Storm sewer piping shall not connect into a manhole at angles less than ninety (90°) degrees to the downstream flows, unless approved by the Engineering Department.

Provide a minimum cover of eight (8") inches over the top slab for all manholes in lawn areas, fifteen (15") inches in roadways, and twelve (12") in driveways.
Catch basins shall be spaced at intervals of not over four hundred (400') feet in the roadway, at low points and at intersections and shall be connected to a storm sewer manhole. Catch basin leads shall be a minimum of eight (8") inches in diameter and shall be fully coated corrugated metal pipe (CMP) or perforated smooth flow double wall plastic pipe (PE) from basin to basin and a minimum of twelve (12") inches pipe from the last basin to the manhole.

Lateral connections to both corrugated metal pipe (CMP) and reinforced concrete pipe (RCP) main line storm sewers shall be made by use of corrugated metal shop fabricated tee's of proper size for the main. Corrugated metal pipe (CMP) tee's shall have a six (6') foot perforated corrugated metal pipe (CMP) stub. All connections shall be encased in crushed stone. Lateral connections to polyvinyl chloride pipe (PVC) storm sewers shall be made with polyvinyl chloride pipe (PVC) wye or Genco DF-40 saddle per the Standard Details provided herein.

Where cul-de-sacs are proposed, the storm sewer lines shall be located so as to provide for the shortest length of laterals possible.

All storm sewer laterals which gravity feed directly from inside the structure shall contain a ball check type backflow prevention valve. Valve shall be located inside the structure.

8.8 MATERIALS
A. General
All materials shall be new and free of defects.

B. Storm Sewers
Storm sewers shall be built of one (1) of the following types of materials:
- Reinforced concrete pipe (RCP) in accordance with ASTM Specification C76. Joints shall be bell and spigot with compression Type III "O" ring gasket.
- Polyvinyl chloride pipe (PVC) meeting requirements of ASTM D3034, minimum wall thickness of SDR-35 and with flexible gasket joint.
- Corrugated polyethylene pipe smooth flow/double wall meeting the requirements of ASTM D3350 with water tight joints.
- All arch pipe shall be reinforced concrete pipe (RCP) with water tight joints.

Corrugated polyethylene drainage tubing (CPE) heavy duty meeting requirements AASHTO Specification M 252-78 and ASTM D1248. Minimum wall thickness of twenty-five thousandths (0.025") inches. (Not for use under pavements.)

Each pipe system shall be designed as to proper strength classification by the developer's professional engineer and the pipe material, thickness and diameter shall be stated on the plans. Heights of cover, nature of foundation soil, type of bedding and trench width shall be considered in specifying the pipe. Developer shall be responsible for providing extra strength bedding, cradle or encasement if the design conditions cannot be met in the field. Whenever the storm sewer is under the road, the town requires that the developer's engineer specify the correct class for H-20 loading at the sewer depth.

All applications requiring low head pipe shall be either Reinforced Concrete "Arch" pipe or Reinforced Concrete "Box Culvert".

C. Manholes and Catch Basins
Storm sewer manholes shall be constructed in conformance with ASTM C478 and the details shown on the Standard Detail drawings in the appendix of these documents.
D. **Frames and Grates**
All frames and grates shall be constructed in conformance with the details shown on the standard detail drawings and in accordance with the following specifications:

Frames and grates shall be rectangular Type 9 galvanized as manufactured by Syracuse Castings (EJ USA) or approved equal. The size of the grating shall match the size of the basin, shall be set firmly in a bed of not less than one (1") inch of cement mortar and adjusted to the finished grade. Manhole frames shall be set directly on the manhole roof slab or on precast concrete spacers which are mortared to the roof of the slab.

Frames and grates shall be designed to support H-20 loading, unless otherwise specified. Frames and grates shall be recticuline design and hot dip galvanized. The frames shall be from the same manufacturer as the grates.

E. **Catch Basins**
Catch basins shall be pre-cast, four thousand (4000 psi) pounds per square inch, air entrained concrete, with five (5") inch reinforced walls, six (6") inch base and be set on a bed of six (6") inches of #1 & #2 washed stone. Six (6") inch diameter openings shall be provided in two (2) or three (3) sides of the unit, depending upon the location, to accommodate four (4") inch underdrain piping. The top cap shall be poured in the field along with the gutter installation.

The catch basin shall be encased in #1 & #2 washed stone around the exterior, extending from the bottom of the catch basin to the top of the masonry wall on a three (3) on one (1) slope. This stone shall be compacted before pouring of the concrete apron.

All catch basins shall have a minimum six (6") inch sump.

The inside and outside walls of the catch basin shall be painted with Kopper's Bitumastic 300-M, FARBERTITE as manufactured by Briggs Bituminous Composition Co. or an approved equal.

Before pouring the concrete apron, the frame shall be adjusted on catch basin wall to allow a one and one-half (1 ½") inch drop from invert of gutter to top of grate (except under special conditions). This drop shall be formed gradually in the invert.

Catch basins may be cast-in-place provided all above listed specifications are met.

Manhole invert channels and benches shall be smooth and semi-circular in shape conforming to the inside of the adjunct sewer section. Changes in direction of flow shall be made with smooth curves with the largest radius permitted.

Catch basins shall have the bench sloped to the receiving sewer without a sump.

F. **Laterals**
Storm sewer laterals installed between the use structure and the main storm sewer shall be a minimum six (6") inch diameter and of one (1) of the following materials:
- Polyvinyl chloride pipe (PVC) in conformance with ASTM D3034 Specifications, minimum wall thickness shall be SDR-35 and with flexible gasket joint.

G. **End Sections**
All end sections shall be galvanized steel. Plastic pipe shall have cast in place headwalls to provide UV protection. Rip rap is required at all outlet pipes.
H. Outlet Control Structures
Control structures for stormwater management facilities shall be constructed with adequate provisions for access to complete maintenance and repairs with Town of Penfield equipment. Control structure shall be designed to be free of clogging while maintaining the requirements for control of water quality and quantity. Access to the control structure shall permit equipment and materials necessary for maintenance.

Overflow spillways shall be constructed of concrete or grouted rip rap to allow access for Town of Penfield equipment to traverse. Spillway shall include downstream erosion protection measures to prevent erosion.

Grates shall be Type B or D. Side grates shall be used for inlets openings. These shall be sloped to allow easy removal of debris.

All rip rap shall be grouted in place around pipe ends. Cast in place headwalls may be used in place of rip rap.

8.9 INSTALLATION
Installation of all storm sewers, laterals, manholes and catch basins shall be in conformance with the installation requirements as specified under these specifications, as well as, the requirements of the standard detail drawing provided herein.

Storm sewers shall have a minimum cover of three (3') feet wherever vehicular traffic is anticipated and provide for a minimum cover of two (2') feet from top of pipe to the road subgrade.

All joints shall be connected with gaskets or mechanical collars, as recommended by the manufacturer.

8.10 TESTING
The entire storm sewer system shall be visually inspected for smoothness of invert, freedom from obstructions and straightness of line. A final inspection of the system will be done prior to release of retainage and contingency funds from the Irrevocable Letter of Credit. At that time the system shall be clean, free of mud and debris and manholes will be adjusted to final grade.

Prior to dedication of the storm or sanitary sewer system to the Town of Penfield, or a release of the Letter of Credit; the pipes, catch basins and manholes shall be properly flushed. This item shall be included in the Letter of Credit. If the Town of Penfield needs to flush the system prior to inspecting, the developer will be charged for the labor and equipment utilized. The Town of Penfield reserves the right to require the storm sewers to be flushed and cleaned at other times if proper erosion and sediment control practices are not met.

If the final inspected condition of the storm system is altered by work in future sections, the Town of Penfield may hold contingency money for remediation of the same. The developer shall flush all storm sewers after completion of the final phase of a development.
SECTION 9

FIRE PROTECTION WATER SUPPLY AND FIRE SERVICE FEATURES

9.1 FIRE PROTECTION WATER SUPPLY

Water is supplied to the Town of Penfield by the Monroe County Water Authority.

Water systems shall be designed to provide adequate fire protection and domestic service in accordance with the Insurance Services Office (ISO). Design and construction shall be subject to Monroe County Water Authority approval.

When private wells are used, the design, location and construction shall be in accordance with the Monroe County Health Department.

In addition, the following minimum requirements shall be met:

A. Hydrant Locations

(1) Single Family Residential Development:

- Along public streets, hydrants shall be located at each intersection and intermediate spacing shall not exceed five hundred (500') feet.
- Where a new dwelling is constructed, so that any portion of the structure is more than six hundred (600') feet from a fire hydrant, as measured by linear lane length of hose or other an approved route, a water main complying with the standards of the Monroe County Water Authority, including hydrant unit, shall be extended to a location determined by the Fire Marshal, or to within six hundred (600') feet of the structure. In lieu of the above referenced requirement, a residential sprinkler system meeting the requirements of the N.F.P.A. Pamphlet 13D and the Fire Marshal's approval upon submittal of appropriate engineering plans, may be installed in a single family residence.

(2) All Other Zones

- Hydrant shall be located at the intersection of the driveway to a project and internal spacing shall not exceed three hundred (300') feet.
- Where a new building is constructed, so that any portion of the structure is more than four hundred feet (400') from a fire hydrant, as measured by linear lane length of hose or other approved route, a water main complying with the standards of the Monroe County Water Authority, including hydrant unit, shall be extended to a location determined by the Fire Marshal, or to within four hundred (400') feet of the structure.
- All hydrants along public highways shall be located within one (1') foot of the R.O.W. line.

All hydrants must be installed and flow tested before the above ground construction is commenced. Flow tests shall be witnessed by the Town's Fire Marshal and shall comply with the Specifications of the Insurance Services Office of New York to produce an "A" rating.

The Fire Marshal, an authorized officer to the appropriate fire district, and the Town Engineer shall approve all hydrant locations, size of hydrants and water mains in new subdivisions, apartment projects, commercial and industrial areas and where new churches and schools are being constructed.

In areas where new construction is being undertaken and public or private water mains and hydrants do not exist, water mains and hydrants shall be installed and be in proper operating
condition prior to the commencement of any above ground construction. Upon written application and for good cause shown, the Fire Marshal may grant temporary exceptions to this requirement, the length and extent of said temporary exception being subject to the sole discretion of the Fire Marshal. In the event that the terms and conditions of said permission are not complied with, the Fire Marshal, in their sole discretion, may revoke said permission.

When municipal water is within close proximity of the property, the developer shall connect to this system. If no municipal system is available, current system and/or proposed system is deemed inadequate by the Monroe County Water Authority, an approved fire protection water supply system installed conforming to NFPA 1142 may be used. All proposed fire protection water supply systems conforming to NFPA 1142 must first be approved by the Fire Marshal and the Fire Chief of the responding fire district in which the building is to be located, prior to commencement of any construction. A set of engineered drawings and hydraulic calculations, including required fire flow for proposed project, shall be submitted to the Fire Marshal for approval. The distribution system shall be sized to obtain the required fire flow at the critical point in the development while satisfying the average daytime domestic draft, in accordance with ISO requirements. Fire flow data and hydraulic calculations for the proposed facilities shall also be submitted for review by the Town Engineer.

Proper back-flow prevention devices shall be installed as directed by the MCWA and the Monroe County Health Department.

9.2 FIRE SERVICE FEATURES

(A) Key Lock Boxes

Any projects that require a fire alarm to be installed as per the NYS Uniform Fire Prevention and Building Code, and/or any project proposing a fire alarm system, shall install a key lock box as per this section.

EXCEPTION: 1 and 2 family dwellings and town houses.

Any project proposing a building with 2 or more tenant spaces shall install a lock box regardless of whether or not a fire alarm system is required or proposed.

EXCEPTION: 1 and 2 family dwellings and town houses.

Any building with multiple tenant spaces may consolidate number of lock boxes at the discretion of the Fire Marshal. Location of lock box(s) shall be determined by the Fire Marshal and the Fire Chief of the responding fire district in which the building is to be located.

It is the responsibility of the project owner or designee to purchase the lock box. Lock box shall be the “Knox” brand. Order forms for the lock boxes are available from the Fire Marshal.
Lock Boxes shall be installed as follows:

- Within 4 feet of latch side of main entrance door and approx. 5 feet AFG (Above Finished Grade), or as approved by the Fire Marshal. When door latches in the middle of doorway opening, such as double horizontal sliding door assemblies, the lock box will be placed within 4 feet of the right hand side of assembly, as viewed from outside the structure, and 5 feet AFG.

- If building is constructed with an entrance vestibule, and the exterior door of the vestibule will remain unlocked at all times, the lock box may be located in the vestibule at the discretion of the Fire Marshal.
SECTION 10 - ROADWAY SYSTEMS

10.1 GENERAL
Street systems shall be designed with due regard to the need for:
- convenient traffic access and circulation;
- traffic control and safety;
- access for firefighting, snow removal and street maintenance equipment;
- stormwater drainage and sewage disposal;
- accommodating the prospective traffic, and so arranged as to separate through traffic from neighborhood traffic insofar as it is practicable;
- reducing potential for high speed of travel;
- providing proper stopping sight distance for a design speed of forty (40 mph) miles per hour;
- promoting pedestrian safety;
- Incorporation of any approved traffic calming measures.

All streets in a new subdivision shall be coordinated with adjoining parcels so as to compose an interconnected system of roadways. Where a subdivision adjoins undeveloped land, its street shall be laid out so as to provide suitable future street connections with the adjoining land when the latter shall be subdivided. Any street temporarily dead ended shall be constructed to the property line and shall be provided with a temporary turnaround of the same dimensions as for permanent dead end streets if in excess of two hundred (200') feet. A notation shall be provided on the subdivision plat for temporary easements for the turnaround until such time as the street is extended. These same requirements shall apply at the discretion of the Town Engineer or Director of Public Works in those cases where the adjoining land is another section of the same subdivision, and which is not scheduled for development at the same time.

Streets shall be logically related to the topography, and all streets shall be arranged so as to obtain as many as possible of the building sites at or above the grades of the streets. Grades of streets shall conform as closely as possible to the originally topography. A combination of steep grades and sharp curves shall be avoided.

Where a subdivision abuts to or contains an existing or proposed arterial street and other existing Town, County or State road, the Planning Board may require marginal access streets, reverse frontage with screen planting contained in a non-access reservation along the rear property line, deep lots with or without rear service alleys, or such other treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic.

Reverse frontage roadways should be avoided wherever possible. Where a subdivision borders or contains an existing controlled access highway right-of-way, the Planning Board may require a street approximately parallel to and on each side of such right-of-way, at a distance suitable for the appropriate use of the intervening land, as for park purposes in residential districts, or for business, commercial or industrial purpose in appropriate districts. Such distances shall also be determined with due regard to the requirements of approach grades and future grade separations.

Traffic calming measures are strongly encouraged in the layout of subdivisions. Long, straight roadways should be avoided. The use of jogs, offsets, and curves should be used in the roadway design.
10.2 DESIGN STANDARDS
All roadways shall be designed and constructed to conform to the requirements set forth in the following table 1:

<table>
<thead>
<tr>
<th>Minor Streets</th>
<th>Collector Streets 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Width of Right-of-Way</td>
<td>60 feet</td>
</tr>
<tr>
<td>Minimum Width of Pavement</td>
<td>20 feet</td>
</tr>
<tr>
<td>Minimum Radius of Horizontal Curves 2</td>
<td>150 feet</td>
</tr>
<tr>
<td>Minimum Length of Vertical Curves 5</td>
<td>100 feet</td>
</tr>
<tr>
<td>Minimum Length of Tangents between Horizontal Curves</td>
<td>100 feet</td>
</tr>
<tr>
<td>Minimum Grade</td>
<td>8%</td>
</tr>
<tr>
<td>Minimum Sight Distance 3</td>
<td>0.5%</td>
</tr>
<tr>
<td>Minimum Sight Distance 3</td>
<td>200 feet</td>
</tr>
</tbody>
</table>

1 These standards may only be modified by the Town Board, subject to the approval of the Town Engineer. Standards of the American Association of State Highway and Transportation Officials (AASHTO) shall govern in determining safe operating speeds and sight distance requirements.

2 Radius of horizontal curves shall be measured to the centerline of the street.

3 Sight distance shall be measured between two (2) points along the centerline of the street on a straight line entirely within the street right-of-way and clear of obstructions, one of the points being three (3') feet above the surface of the street and the other three and one-half (3 ½') feet above the surface.

4 Collector streets which do not service an area containing at least one hundred (100) dwelling units, under ultimate area development, may be considered as minor streets for purposes of design standards. The service area of a collector includes those dwelling units on minor streets that feed into the collector.

5 But in no case less than twenty (20') feet for each one percent (1%) difference in grade.

6 But in no case less than thirty (30') feet for each one percent (1%) difference in grade.

10.3 DEAD END STREETS
Where a street does not extend to the boundary of the subdivision and its continuation is not needed for access to adjoining property, it shall be separated from such boundary by a distance sufficient to accommodate a lot meeting the requirements of the Zoning Ordinance. Reserve strips of land shall not be left between the end of a proposed street and an adjacent piece of property. The Planning Board may require the reservation of an easement for pedestrian traffic or utilities. A cul-de-sac with a minimum right-of-way radius of sixty (60') feet shall be provided at the end of any permanent dead end street. No proposed dead end street shall exceed a length of one thousand (1,000') feet from the intersection of the existing street from which it will be constructed to the most distant point of the radius of the proposed cul-de-sac.

10.4 STREET INTERSECTIONS
The location of subdivision street intersections with other Town, County, or State roadways shall be located to provide the maximum sight distance available along the frontage. The Town of Penfield may require alternative access to another roadway or parcel if the sight distance at the original access does not meet the minimum requirements of AASHTO.

Intersections of roadways with a collector roadway should be located directly opposite existing roadway intersections, wherever possible. Where this cannot be provided, the minimum intersection spacing shall be three hundred (300') feet apart or located so as not to cause conflicts with left turn vehicles. This is to be measured from centerline to centerline of roadway.

Intersections shall not be located within a horizontal curve of the adjoining street, unless approved by the Town Engineer.
Intersections shall be designed without any sudden changes in grade or alignment (reverse curves) within one hundred (100') feet of an intersection. Within fifty (50') feet of an intersection, streets shall be approximately at right angles and in no case shall the angle of intersection be less than seventy-five (75°) degrees without additional channelization. Minimum curb radii shall depend on the intersecting street types; and shall be as follows:

- Collector with collector: 50 feet
- Minor with collector: 35 feet
- Minor with minor: 35 feet
- Minor to arterial: 35 feet

All property boundaries at street intersections shall be rounded with a minimum radius of twenty (20') feet, or have comparable cutoffs or chords. Within triangular areas formed by the intersecting street lines, for a distance of seventy-five (75') feet from their intersection and the diagonals connecting the end points of these lines, clear visibility for traffic safety shall be provided by exclusion of plantings, signs, or structures. Clearing or re-grading shall be completed as necessary to meet this requirement.

Grades of roadways within the intersection should not exceed one (1%) percent and shall not exceed one and one-half (1.5%) percent for a distance of fifty (50') feet from the intersection. From fifty (50') feet to one hundred (100') feet, the grades should not exceed three (3%) percent and in no case shall they exceed five (5%) percent.

Traffic circles, chicanes, diverters or other traffic calming measures may be required at intersections, or at other locations deemed necessary, where present or anticipated traffic conditions indicate their advisability for traffic control or safety.

All commercial entrances shall meet the above requirements for access onto highways.

10.5 STREET GRADES
Areas within the right-of-way shall be graded as necessary to eliminate any slopes steeper than one (1') foot vertical on three (3') foot horizontal. Guiderail shall be required for areas of steep slopes, adjacent to stormwater ponds, or other areas of concern as outlined in the AASHTO guidelines.

10.6 STREET NAMES AND SIGNS
All street names shall be subject to the approval of the Director of Public Works and Monroe County 911.

Names shall be sufficiently different in sound and spelling from other street names in the County to avoid confusion to emergency response crews. A street that is a continuation of an existing street shall bear the same name. A proposed street name that differs from an existing street name in the County, in type of street only (“Road” instead of “Lane”) shall not be acceptable. All private roads shall have their own name and each house shall have a number assigned to that street. Relating street names to features of local historical, topographical or other natural interest is encouraged. All street name signs shall be installed by the Department of Public Works as soon as a road has been boxed out and gutters/curbs and asphalt binder has been installed. The developer shall be billed for the cost of all signs.
Installation of all traffic control signage shall be as directed by the Manual of Uniform Traffic Control Devices (MUTCD) and shall be approved by the Town of Penfield Town Board.

10.7 MONUMENTS
Permanent survey monuments shall be set on the boundary of the right-of-way of all new roadways at intersecting streets, at the P.C. and P.T. of curves, and other locations determined by the Town Engineer. Monuments shall be placed on one (1) side of the street only and at only one (1) corner of intersecting streets. Additional monument points shall be installed along the line of sight or at other locations determined by the Town Engineer. Maximum spacing of monuments shall be eight hundred (800') feet. A minimum of one monument in each phase and on each roadway shall be tied into the approved datum and the State Plane Coordinate System, New York State West Zone.

Monument locations shall be shown on the subdivision plat and a record drawing with the tie distances to the monuments shall be submitted to the Engineering Department after installation of monuments.

Monuments shall be of stone or concrete and not less than four (4") inches in diameter or square, and not less than forty-two (42") inches long or from the top of underlying rock. Concrete monuments shall be reinforced with steel rods and a plug, brass plate, or pin shall serve as the point of reference. If stone, a drilled hole shall serve as the point of reference and a magnetic rod or other suitable metal shall be placed adjacent to the monument to allow for recovery. Brass plates, as shown in the Standard Details, are required for all monuments tied into the approved datum.

10.8 MISCELLANEOUS STREET IMPROVEMENTS
In addition to the required improvements specifically referred to in these regulations, subdivision plats shall provide for all other customary elements of street construction and utility service which may be appropriate in each locality as determined by the Planning Board upon consultation with the Town Engineer. Such elements may include, but shall not be limited to, street pavement, gutters, stormwater inlets, manholes, curbs, sidewalks, street lighting, water mains, fire hydrants, fire alarm signal devices and sanitary sewers. Underground utilities within the street right of way shall be located as required by the Director of Public Works and the Town Engineer. Underground service connections to the property line of each lot shall be installed before the street is paved. All street improvements and other construction features of the subdivision shall conform to the Town of Penfield's specifications and shall be subject to approval by the Department of Public Works and/or the Town Engineer. No utilities shall be installed within the box out limits of a town road.

10.9 WIDENING OF EXISTING RIGHT OF WAY
Where a subdivision adjoins an existing street that does not conform to the right of way standards given in these regulations or the latest Town of Penfield Comprehensive Plan, the developer shall dedicate whatever additional right-of-way width is necessary to provide, on the subdivision side of the normal centerline, at a width which is equal to at least one-half (1/2) of the minimum standard width for the respective type of street.

10.10 TYPICAL ROAD SECTION
The Town of Penfield accepts three (3) standard road sections, as shown in the Standard Details, that are required for dedicated roadways. Pavement and right-of-way widths may be increased under special circumstances at the discretion of the Planning Board and the Director of Public Works.
10.11 LANDSCAPED MEDIANs
The Town of Penfield may permit the installation of a landscaped median at the intersection entrance to the development. Medians shall be a minimum of six (6') feet wide with a minimum of fifteen (15') feet travel lane on each side. The median shall have a minimum setback from the edge of the existing right-of-way of ten (10') feet. Medians shall have mountable concrete or granite curbing around the entire perimeter. The roadway transition to a standard roadway section shall begin a minimum of twenty (20') feet from the edge of the median and shall have a minimum taper of fifty-five (55') feet. There shall be no trees planted within this median; only shrubs and flowers, not to exceed three (3') feet in height, will be allowed within the median to maximize sight distance and minimize conflicts within the driving lane. The design of landscaped medians shall be approved by the Town of Penfield. The maintenance of the landscaping shall be the responsibility of a Home Owners Association or via a Special Improvement District encompassing the development.

10.12 LANDSCAPED CUL-DE-SAC
The Town of Penfield will no longer allow the construction of a landscaped island cul-de-sac, effective the date of this revision.

10.13 ROADWAY DEDICATION
Upon completion of a roadway for dedication, the developer shall be responsible for furnishing the Town of Penfield with the following:
- A two (2) year maintenance bond in the amount of ten (10%) percent of the total cost of the roadway construction; and,
- A written statement from the Town's Receiver of Taxes stating that all taxes have been paid; and,
- A letter to the Town Supervisor requesting roadway dedication.

The Town Engineer and Town Supervisor shall authorize the final release of funds from the Irrevocable Letter of Credit only after the roadway has been approved for final dedication.

10.14 PRIVATE ROADS & DRIVEWAYS
A private drive is defined as servicing more than two (2) residential lots. The minimum width of a driveway shall be twelve (12') feet. A private drive shall be built to the standards of a Town road (including subbase, binder, and top), in accordance with the Fire Code of New York State (Chapter 5).

Private roads shall provide emergency vehicle turnouts at a minimum spacing of five hundred (500') feet and shall be designed in accordance with the Fire Code of New York State.

Private drives shall be included in the Irrevocable Letter of Credit to cover sub-base preparation, base placement, binder and top pavement installation, and all other associated construction. The private drive must be built prior to the issuance of a building permit as shown on the approved site plan.

All private drives shall have a dead end fire apparatus turnaround in conformance with the Fire Code of New York State (appendix D). The developer shall install a No Parking sign at each leg of the turnaround. The Town of Penfield is not responsible for snow removal or maintenance of any private road. All driveways must be paved within the right-of-way limits of the receiving roadway.

10.15 COMMERCIAL DRIVEWAYS
All commercial driveways shall be a minimum of twenty-four (24') feet wide, unless otherwise directed by MCDOT or NYSDOT. The applicant shall submit an engineering report for justification of any changes from this requirement. The engineering report shall provide verification that the length of the driveway has sufficient throat length to accommodate the project traffic without conflicts to internal intersections/entrances.
10.16 ROADWAY MATERIAL AND CONSTRUCTION

A. General
All materials used in the work shall meet the requirements as specified, unless the same are altered by specific requirements under any itemized specification or modifying notes shown upon the plans. In the absence of any specific reference to specifications, the material to be incorporated into any project, and the work to be performed are intended to conform to the New York State Department of Transportation Specifications, as determined by the Town Engineer and the Director of Public Works.

B. Inspection
The binder course shall be placed only after the subbase course has been approved by the Town. Inspections are completed by the Public Works Department. A minimum of twenty-four (24) hours notice is required. The Public Works Department reserves the right to require the contractor to provide density testing of subbase at the developer’s cost.

C. Installation
In order to assure the structural integrity of the sub-grade and subbase courses, the following general rules shall apply:

- Where crossover trenches are required for utility services, the trenches shall be back-filled with the excavated material, if acceptable and approved by the Town of Penfield’s inspector, or crusher run stone. Material shall be compacted in six (6") inch lifts with vibratory tamping equipment. This includes crossovers for gas mains and other utilities and services.
- All utility crossing shall be installed prior to the installation of any stone base.
- All utility lines crossing the roadway shall have a minimum of twenty-four (24") inches cover from finished grade including laterals, gas, water, electric and CATV conduits.
- After properly shaping and obtaining approval of the sub-grade, the crusher run subbase may be placed. The entire foundation course must be compacted on either side from gutter to center.
- Crusher run subbase courses for permanent roads must not be used for access roads in wet weather, or at such times when the sub-grade could begin "pumping" into the crusher run subbase course.
- Where pavements must be placed in an embankment condition, the entire height of embankment must be constructed with the use of standard and appropriate compaction equipment. This equipment shall consist of a sheepsfoot roller, vibratory roller or similar equipment. The entire embankment area shall be compacted to ninety-five (95%) percent maximum modified dry density per AASHTO in accordance with ASTM D1557. The developer shall provide results of certified compaction tests undertaken by a competent soils testing laboratory for all fill under structures or roadways, upon request by the Town of Penfield.
- The approved construction season for installation of road pavement shall be in conformance with NYSDOT Standard Specification Section 402.

D. Excavation
Clearing and grubbing and the removal of sod and topsoil shall be stored for later use, or placed in the embankment beyond the pavement limits as directed by the Town of Penfield’s inspector. All stumps, brush, trees and other rubbish shall be disposed of in a manner satisfactory to these specifications. None of the above materials may be buried on site.

E. Subgrade
The contractor shall excavate the road box to the designed sub-grade elevation allowing for pavement, gutter, base and weep thickness. The sub-grade width shall be a minimum of twelve (12") inches wider on each side than the pavement and gutter width as shown in the Standard Details. The sub-grade shall be excavated or "boxed" following the depth and alignment of the stakes established by the project engineer or surveyor. These stakes shall be at intervals of not more than fifty (50’) feet and at twenty-five (25’) feet in flat areas with a grade of less than one (1%) percent.
After being excavated to the proper depth, the sub-grade shall be graded and crowned one-quarter inch (1/4") per foot of width either side of centerline and also allowing for a three (3') foot wide by twelve (12") inches deep weep wedge, as shown in the Standard Details. Once properly graded, the sub-grade shall be rolled by either a ten (10) ton roller or vibratory roller capable of producing a minimum twenty-seven thousand (27,000 lbs) pound dynamic force. Any rocks greater than six (6") inches in diameter within one (1') foot of sub-grade elevation shall be removed.

Any unsuitable material found below sub-grade shall be removed and replaced by approved #3 crusher run stone and compacted in six (6") inch lifts. If the fine grade becomes rutted, it shall be re-graded and rolled before the subbase is placed and compacted.

If any unstable or unsuitable sub-grade soils are encountered, they shall be removed and replaced as follows:
- The entire soft area shall be undercut to an adequate depth and width to provide a firm surface. The undercut area shall then be rolled and inspected.
- Mirafi 600x geotextile fabric (or equivalent) shall then be laid into the undercut area overlapping two (2') feet onto non-undercut area on each side.
- Then the undercut area shall be back-filled and compacted in six (6") inch lifts with #2 crusher run stone.

NOTE: Mirafi 600x can be substituted only with an approved equal meeting or exceeding a Mullen Burst test of six hundred (600 psi) pounds per square inch or greater. If the undercut depth exceeds the twelve (12") inch weep depth, the Town of Penfield will require a deepening of the weep wedge or a similar method approved by the Town of Penfield draining the undercut area.

F. Road Subbase
The contractor shall furnish and put in place and compact a twelve (12") inch base of crusher-run limestone in two (2) six (6") inch lifts as shown in the Standard Details. Lifts shall be thoroughly compacted by mechanical methods before acceptance will be given.

The road base material shall have a gradation equal to the following:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 1/2&quot;</td>
<td>100</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>50</td>
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<tr>
<td>#10</td>
<td>20</td>
</tr>
<tr>
<td>#100</td>
<td>6</td>
</tr>
</tbody>
</table>

The subbase shall be placed on a graded, crowned and compacted sub-grade, free of ruts and disturbed earth as follows:
- After proper rolling and grading of the sub-grade, the three (3') foot wide by twelve (12") inch deep wedge shall have a four (4") inch perforated polyvinyl chloride pipe (PVC) or plastic (PE) underdrain pipe installed into the channel invert continuously. The four (4") inch underdrain pipe will be connected by use of appropriated couplers and ends shall be tied into drop inlet weep holes and protrude two (2") to three (3") inches beyond the inner wall.
- The first six (6") inch lift shall be placed and graded, maintaining the specified crown of one-quarter (1/4") inch per foot and rolled thoroughly with a vibratory roller capable of producing a minimum dynamic force of twenty-seven thousand (27,000 lbs) pounds or a ten (10) ton roller.
- The second six (6") inch lift shall also be placed and graded to conform to the lines and grades as shown in the Standard Details. All depressions and/or “boney” areas shall be brought to grade and/or choked with #00's and #1's crushed limestone. The material shall then be rolled thoroughly with a vibratory roller from the gutter to the centerline.
Special care should be given during this operation not to harm the concrete gutters (i.e., scraping with grader blade or hitting with roller wheels). Special attention should also be given to obtaining good compaction next to the gutter. Use of a plate tamper along the gutter line shall be required.

F. Bituminous Concrete Pavement
The contractor shall furnish and construct a two (2) course bituminous concrete pavement layer to conform to the required thickness and cross-section as shown on the plan and in the Standard Details.

The materials shall conform to the latest revision of the New York State Department of Transportation, Design and Construction Division Specification Item 403.19 M Type 7F Top and 403.13 M Type 3 Binder. Upon request, the contractor shall furnish the Town of Penfield’s inspector, in writing, the source of materials and provide a written description of the material to be used including size and percentages of the aggregate and asphalt. The Town of Penfield reserves the right to modify the percentages of the aggregates to be used.

Before starting the laying of the asphalt pavement, the crusher run shall be graded and compacted between the concrete gutters allowing for four (4") inches of reveal from top of gutter to subbase course. Concrete gutters must be completely backfilled and have had a minimum of seven (7) curing days before paving. The asphalt shall be applied in two (2) courses consisting of a compacted thickness of a three (3") inch binder course and a one (1") inch top course. The pavement shall be laid by an approved self-propelled, asphalt paving machine with vibrating screed. The paver speed shall be slow enough so as not to pull the binder course leaving voids. Each course will be compacted by rolling with a ten (10) ton roller at the appropriate time by a competent operator. The one (1") inch top course shall be applied after one (1) full winter season and within one (1) year after the installation of the binder course and not before all the criteria listed herein have been satisfied.

The Town requires the receipt of a two (2) year maintenance bond in a value equal to ten (10%) percent of the pavement costs in the Irrevocable Letter of Credit.

Before applying the top-wearing course, the following conditions must be met:
• Any cracked or deteriorated gutters shall be removed and replaced. All removals should occur at an existing joint.
• Any dips or deteriorated pavement shall be cut out, the subbase checked and/or removed, the subbase replaced and compacted and the binder reinstalled.
• The binder surface shall be thoroughly flushed with water and dry. Broom sweeping or other mechanical methods of cleaning will not be sufficient to waive the flushing requirement.
• A tack coat of asphalt emulsion NYSDOT 702-09 shall be applied at a rate of 0.02 to 0.10 gallons per square yard to all streets before top course is installed.

The final top course shall be finished level or slightly above (maximum 1/4") the concrete gutters; at no time shall it be below.

The contractor is responsible for the protection of new pavement until properly set. This protection is necessary on subdivisions where the traffic is mostly by cars starting and stopping or by heavy trucks.

10.17 CONCRETE GUTTERS OR CURBS
A. Materials
The contractor shall furnish and place Portland cement concrete gutters or curbs in accordance with the thickness and cross-section as shown in the Standard Details and as stated in the following specifications:

The material shall conform to the latest New York State Department of Transportation, Design and
Construction Division Specifications "Item 624-2.02 - Conventional Formed Concrete Gutters". The concrete shall be Class A and shall have a minimum compressive strength of four thousand (4000 psi) pounds per square inch after twenty-eight (28) days.

The aggregate shall meet the requirements of Section 703-02, "Coarse Aggregates". The required gradation for coarse aggregates is shown in Table 703-2, "Coarse Aggregate Gradation" for Class A concrete. Fine aggregate shall meet the requirements of Section 703-07, "Concrete Sand".

Cement shall meet the minimum requirements for Class A concrete and shall consist of Portland cement, Type 2, unless otherwise indicated on the plans. Proportioning of aggregates and cement for Class A concrete is indicated in Table 501-3, "Concrete Mixtures".

The air entrainment for the concrete shall be between four (4%) percent to eight (8%) percent, with a desired air content of six (6%) percent.

Setting time may be retarded when necessary for proper placement. The quantity of admixtures incorporated into the mix shall be in compliance with Section 501-3.01.

Water shall be added in amounts as required to produce the desired slump of three (3") inches with a maximum allowable slump of four (4") inches, unless otherwise approved by the Town of Penfield’s inspector. Concrete slumps found too low to produce satisfactory results shall be corrected by additions of water where feasible, with proper re-mixing procedures. Re-mixed concrete found to be unsatisfactory shall be rejected for use in the work.

The Portland cement batching plant shall meet all requirements of the New York State Department of Transportation, including periodic inspection of facilities, concrete mixing, transportation and discharging and concrete uniformity as specified under Sections 501-3.02, 501-3.03, 501-3.04 of the New York State Department of Transportation Standard Specifications.

Any official addendum to Standard Specifications, published by the NYSDOT Design and Construction Division concerning cast-in-place concrete gutter that supersedes the above shall be adhered to.

All sections or tables referred to above are found in the New York State Department of Transportation, Design and Construction Division Specifications.

B. Installation

Concrete gutters or curbs shall be installed along all new roadways and extended to the tangent of all existing roadways.

The concrete gutters shall be constructed of the shape shown in the Standard Details and shall conform to the lines and grades shown on the plans and as approved by the Town of Penfield. Standard six (6") inch steel forms shall be used and set to the grade and alignment by stakes established by the project engineer for this purpose or may be slip formed. These stakes shall be set at intervals of not more than fifty (50') feet and twenty-five (25') feet in flat areas with a grade of less than one (1%) percent. The base that these forms are set upon shall be graded to obtain a full six (6") inches of concrete, particularly under the invert. This subbase material between forms shall be compacted by mechanical means, preferably a vibratory tamper. These forms shall be oiled before the placing of concrete.

Expansion joints shall be installed every fifty (50') feet with saw cut (or dummy) joints, minimum depth of two (2") inches, every ten (10') feet on center. An expansion joint shall be installed at the end of a day’s work or wherever the placing of concrete is stopped for any reason. In no event shall the distance between dummy joints be more than ten (10') feet. Expansion joints shall be constructed of one-half
(1/2") inch, pre-molded joint material. Special attention shall be given to maintaining a uniform flow line through the expansion joint.

The gutter shall be screed longitudinally with a suitable straight edge. The screed shall be worked laterally, i.e., parallel with the centerline of the gutter from the invert of the gutter to the outer edges. This shall be done during the setting of the concrete. When gutters are installed by this "hand method" special attention should be given to the "spading" of the concrete along the sides of the forms.

The gutter may also be installed by use of an approved gutter machine using the proper screed to form the invert shown in the Standard Details and equipped with a vibratory attachment.

At the appropriate time the concrete shall be edged with a proper metal edging tool and then shall be broomed lightly with a fine-bristled broom.

Contractor shall protect the concrete for a minimum of twenty-four (24) hours. Any gutters which are damaged shall be removed and replaced at the contractor's expense.

The forms shall not be removed until the concrete is sufficiently "set" to prevent chipping of the edges. The gutter shall not be back-filled for a minimum of three (3) days after the placement of concrete. The gutters shall be protected from traffic for seven (7) days to avoid damage to them.

During Cold Weather Installation, concrete shall not be installed while there is frost in the ground. Concrete installed where the next twenty-four (24) hour temperatures will be below forty (40°F) degrees Fahrenheit shall be suitably covered by insulated blankets, or other means to prevent freezing.

During Wet Weather Installation, concrete shall not be installed where there is water laying between the forms or where the crusher run is soft from rain. Concrete installed during a rainstorm shall be covered by a waterproof material immediately. Contractor is responsible for covering work at the end of the day to protect the concrete from inclement weather.

Curing of concrete shall be cured by spraying any commercially available hardener/curing compound. The product shall be VOC compliant. The spray shall be applied to the gutter at the coverage rate as specified by the manufacturer.

10.18 MAILBOXES
Mailboxes shall be installed in the right-of-way with posts as shown in the Standard Details. Mailboxes shall be grouped together in units of two (2) or four (4) when possible. Multiple family developments shall be grouped in one location. Mailboxes shall not hinder intersection site distance. Support structure shall not have a rigid foundation or support system that will create an additional hazard to vehicles, bicyclists, or pedestrians. Mailbox shall be installed forty-four (44") inches above grade and shall be a minimum of six (6") inches from the edge of the travel lane or gutter.
SECTION 11 - SIDEWALKS

11.1 GENERAL
Sidewalks shall be installed, where required, in accordance with the current Town of Penfield Sidewalk Policy. Minimum width of all walks shall be five (5') feet with a minimum five (5') foot planting strip or eight (8') feet wide without a planting strip, unless otherwise directed. Walks shall be installed to provide a smooth and uniform slope and alignment with consideration given to both pedestrian use and snow removal.

All walks shall have a maximum cross slope of one-quarter (1/4") inch per foot and installed with the back edge elevation a minimum of six (6") inches above the edge of pavement of the adjacent roadway. A swale shall be installed between the roadway pavement and the sidewalk to collect runoff. A catch basin or crossover culvert may be required to collect runoff into the storm sewer system.

If sidewalk installation encroaches on existing open swales or cuts off the roadside drainage in any way, the area shall be piped with a proper size and type of pipe as determined by the Director of Public Works or the Town Engineer.

Walks must be constructed continuously through all residential and commercial driveways. Sidewalk depths shall be increased to six (6") inches at all driveways. Handicap ramps, in conformance to the Standard Details provided herein, are required at all driveways and roadways with an approved finish.

11.2 MATERIALS
All sidewalks shall be constructed to meet the following requirements:
- Concrete shall have a minimum compressive strength of four thousand (4000 psi) pounds per square inch after twenty-eight (28) days. All concrete shall be air entrained with an air content between four (4%) percent and six (6%) percent. The thickness shall be a minimum of five (5") inches.
- Subbase course shall be a minimum of four (4") inches of #1 or #2 or crusher-run stone or NYSDOT Item No. 4 gravel.
- Reinforcement of concrete shall consist of a minimum of 10X10-W2.9XW2.9 WWF (flat sheets only) or fiber reinforcing mesh in lieu of WWF. Should WWF be utilized, the minimum overlap of sheets shall be six (6") inches. The WWF shall be located in the upper third of the sidewalk. The contractor shall use chairs or masonry blocks to support the reinforcing sheets.
- The top surface and any other exposed surfaces shall be coated with two (2) coats of a combination curing compound sealer, such as "Accuseal", "Polyclear" or approved equal.

11.3 INSTALLATION
The contractor shall remove any topsoil and unsuitable subsoil to obtain a stabilized subgrade for the new sidewalks. The subgrade must then be graded, sloped and compacted before placement of the stone subbase course.

Subbase course material shall be installed to extend six (6") inches outside the limits of the proposed sidewalks. Stone subbase material shall be thoroughly compacted by means of a minimum 2 (two) ton roller until no movement is observed ahead of the roller. If the sub-base area becomes soft during construction, the Town of Penfield’s inspector may require the unsuitable material to be removed and the excavation filled with stone.

Concrete shall be placed in sections not to exceed twenty-five (25') feet in length. Between each section, expansion joint material shall be installed flush with the top surface of the concrete. Tooled
joints shall be formed every five (5') feet and shall be least two (2") inches deep.

Concrete placement methods shall be in conformance with standards of good workmanship and these specifications. All forms shall be made of steel, the full height of the required sidewalk section. Concrete shall be covered to protect against damage, frost, and/or rain.

The sidewalk surface shall be properly floated and troweled and the edges of each five (5') foot square block shall be finished with an edging tool. The entire surface shall then be lightly broom finished.

The concrete sidewalk shall be cured by spraying any commercially available hardener/curing compound. The product shall be VOC compliant. The spray shall be applied to the sidewalk at the coverage rate as specified by the manufacturer’s recommendations.

11.4 DETECTABLE WARNING SYSTEMS
All detectable warning systems shall be installed in accordance with the New York State Department of Transportation and the Americans with Disabilities Act (ADA) regulations.

The detectable warning plates shall consist of cast iron, pressed into and installed level with the surface of the sidewalk apron prior to the concrete curing.
12.1 GENERAL
The Town of Penfield is supportive of initiatives to preserve water quality in all receiving water bodies. Water quality guidelines are designed to reduce the thermal impacts, sediment load, and intrusion of pollutants into sensitive waterways that support fish and wildlife habitat. Water quality measures shall be incorporated into all developments either through construction of man-made wetlands, mechanical purification methods, and well designed and maintained erosion and sedimentation control plans.

12.2 DESIGN
All development shall incorporate water quality measures into the design of the project if they meet the following thresholds:

- Project involves the creation of an additional 6,000 square feet or more of impervious surface.

Best management practices shall be utilized that are consistent with the New York Guidelines for Urban Erosion and Sediment Control and the NY State Standards and Specifications for Erosion and Sediment Control (blue book latest version).

The required treatment volume shall be calculated per the NYSDEC manual. The wetland treatment systems shall be designed to treat the first 1.00" of runoff from the drainage area.

Projects that will disturb soil in excess of 1 acres shall submit a Stormwater Pollution Prevention Plan. All projects that disturb soil in less than 1 acre shall submit an Erosion and Sedimentation Control Plan.

The use of mechanical treatment systems may be considered upon review by the Town Engineer. The developer must submit a Property Maintenance Agreement to assure annual inspection and the long-term care and cleaning of any mechanical treatment systems.

Under some instances, the developer may be required to submit cash in lieu of on site treatment facilities. This fee shall be used for the creation of a regional water quality treatment facility where a greater benefit can be achieved to the downstream receiving waters or other improvements within the watershed.

All facilities shall be designed to provide the following:

- Meet the requirements of the NYSDEC latest General Permit
- aesthetically pleasing, appearance,
- safe for adjoining property owners,
- reliable,
- promote wildlife habitat,
- maintenance free,
- of appropriate scale to the adjoining area.

12.3 CONSTRUCTION
Water quality measures shall be utilized during the construction of all projects. Erosion and sedimentation control plans should mitigate any impacts to adjoining downstream properties and receiving waters.

The Irrevocable Letter of Credit shall include sufficient costs to install, maintain and remove erosion and sedimentation control measures. A minimum of 50% of the monies in the letter of credit for erosion control will be held until all disturbances are complete and ground cover has been re-
The following minimum erosion and sediment control standards shall be implemented:

- Existing vegetation should be retained and protected as much as possible.
- Sediment control measures should be designed to protect the character of waterbodies on site and off site. The measures shall be in place prior to any land disturbance and shall remain until permanent ground cover is established.
- The off-site impacts of erosion and sedimentation should not be greater during and following land disturbance activities than under pre-development conditions.
- Water in stream reaches on site and downstream of the site should not have substantial visible contrast relative to color, taste, odor, turbidity, and sediment deposition from the water in reaches upstream of the construction site.
- Sediment laden runoff should not be allowed to enter any waterbody in such quantity that would result in deposition on the bottom of the waterbody, degrade its natural biological functions, or be deleterious to the classified usage of the stream.
- All runoff from disturbed areas should be directed to the sediment control devices.
- Perimeter grading should blend with adjoining properties.
- Surface runoff that is relatively clean and sediment free should be diverted or otherwise prevented from flowing through areas of construction activity.
- A fill associated with an approved temporary sediment control structure or permanent stormwater management facility should not be created that causes water to pond off site on adjacent property without permission of the land owners.
- Accumulated sediment should be removed when it takes up 60% of the storage capacity of a control structure, or when directed by the Town Engineer.
- Permanent swales or other points of concentrated flow should be stabilized. Biotechnical approaches are preferable to using sod, gabions, or rip rap where water quality is a high priority or where the flows permit.
- All sites should be seeded and mulched with erosion control materials (straw mulch, jute, or wood shavings) within 7 days of final grading. If construction has been suspended, or sections completed, areas should be seeded immediately and stabilized with erosion control materials.
- On cut sides of roadways, ditches should be stabilized immediately with rip rap or other non-erodible liners. Where seeding is approved, a mulch should be used and soil should be lined and fertilized.
- All slopes steeper than 3(H):1(V), as well as basin or trap embankments, should be stabilized with sod, seed, and anchored straw mulch, or other approved stabilization method.
- A minimum 50’ setback distance from flood hazard areas should be provided along stream corridors.

A detailed construction phasing plan is required that provides protection of completed stormwater facilities, grades swales, and steep slopes.
SECTION 13 - STREET TREE INSTALLATION

13.1 GENERAL
The Town of Penfield requires all developments to install trees along the project frontage of the existing and proposed roadways (private and public).

13.2 INSTALLATION
Plantings shall be on private property, outside of the right-of-way and outside of any existing utility easements, or as directed by the Town of Penfield Landscape Consultant.

A minimum of two (2) trees are required per residential lot and shall be planted at equal spacing not to exceed seventy-five (75’) feet on center along the right-of-way. All frontages in non-residential districts shall be planted at a similar equal spacing.

13.3 MATERIAL
Trees shall be a minimum of two (2”) inch caliper and a minimum of ten (10’) feet in height, with a B&B root system. All materials shall meet HARDY ZONE (Monroe County Area) Zones 3-5.

Plant material shall be one of the following:

**ACER**

<table>
<thead>
<tr>
<th>Variety</th>
<th>Height</th>
<th>Flower</th>
<th>Spread</th>
<th>Fruit</th>
<th>Shape</th>
<th>Foliage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platanoides Cleveland (Zone 3)</td>
<td>50’</td>
<td>greenish-yellow</td>
<td>25’</td>
<td>1½”-2”, winged</td>
<td>upright, oval</td>
<td>dark green</td>
</tr>
<tr>
<td>Platanoides Crimson King (Zone 4)</td>
<td>40’</td>
<td>yellow</td>
<td>35’</td>
<td>1½”, winged</td>
<td>oval</td>
<td>maroon-red</td>
</tr>
<tr>
<td>Platanoides Deborah' P.P.4944 (Zone 4)</td>
<td>45’</td>
<td>yellow</td>
<td>40’</td>
<td>1½”-2”, winged</td>
<td>broadly oval to round</td>
<td>dark green</td>
</tr>
<tr>
<td>Platanoides Drummondi' (Zone 4)</td>
<td>35’</td>
<td>yellow</td>
<td>25-30’</td>
<td>creamy White; varigated</td>
<td>broadly oval</td>
<td>light green; creamy White; varigated</td>
</tr>
<tr>
<td>Platanoides Emerald Queen (Zone 3)</td>
<td>50’</td>
<td>yellow</td>
<td>35-40’</td>
<td>1½-2”, winged</td>
<td>oval</td>
<td>dark green</td>
</tr>
</tbody>
</table>

The vigorous upright habit and dense foliage make Cleveland especially useful for streets and golf courses. Excellent, golden-yellow fall color. The foliage stands up well to summer heat.

Rich maroon-red leaf color is retained throughout the summer. Dense foliage turns deeper red in autumn.

Similar to Schwedler Maple, but has a straighter growing form and more vigor. It has a strong, upright head with brilliant red foliage in spring which matures to a dark green, turning golden-yellow in autumn.

A very striking cultivar with attractive variegated foliage, light green with a broad creamy-white margin. Autumn foliage is golden-yellow. Useful for parks, golf courses, or street tree plantings.

A rapid growing, upright tree with excellent branching habit. Bright yellow fall color. A very good street tree.
Rubrum Armstrong (Zone 3)  
Height: 45'  
Spread: 15'  
Shape: narrow, upright  

Armstrong Red Maple  
Flower: red  
Fruit: ¾", red, winged  
Foliage: medium green  

Narrowest of the columnar maples. Its compact, upright form gives it a formal appearance.

Rubrum Autumn Flame® (Zone 3)  
Height: 50-60'  
Spread: 40-50'  
Shape: broadly rounded  

Autumn Flame Red Maple  
Flower: red  
Fruit: none  
Foliage: medium green  

The earliest of the red maples to color in the fall, consistently producing a brilliant red display. Leaves are smaller than the species and are borne on a symmetrical, dense, rounded head.

Rubrum October Glory® (Zone 3)  
Height: 50'  
Spread: 35-40'  
Shape: oval  

October Glory Red Maple  
Flower: red  
Fruit: 1½-2", winged  
Foliage: green  

The lustrous summer foliage turns a deep crimson red in fall, staying on weeks after other red maples have defoliated. Develops into a very shapely tree.

Rubrum Franksred (Zone 3)  
Red Sunset®  
Height: 50'  
Spread: 35-40'  
Shape: dense upright, oval  

Red Sunset® Red Maple  
Flower: red  
Fruit: 1½-2", winged  
Foliage: green  

One of the best maples. It is upright and spreading when young, developing an oval head. Lustrous foliage turns red and orange-red in the fall, and has silvery bark for winter interest. Very hardy.

Saccharum (Zone 3)  
Sugar Maple  
Height: 65'  
Spread: 45'  
Shape: oval  

An upright oval head with dense foliage, changing to yellow, orange and red in the fall.

Saccharum Bonfire P.P. 3817 (Zone 4)  
Bonfire Sugar Maple  
Height: 65'  
Spread: 50'  
Shape: broadly oval  

A rapid growing selection exhibiting good growth and brilliant orange-red fall color. Good heat tolerance.

**HONEYLOCUST**  
Glenditsia triacanthos inermis Imperial® (Zone 4)  
Imperial Honeylocust Impcole  
Height: 35'  
Spread: 30-35'  
Shape: rounded  

Fast, straight growing, graceful spreading head. Dense symmetrical branching. Golden-yellow foliage in autumn.

Glenditsia triacanthos inermis Skyline® (Zone 4)  
Skyline Honeylocust Skycole  
Height: 45'  
Spread: 40-45'  
Shape: pyramidal  

A very popular vigorous growing cultivar, tolerates a wide range of soil types. Golden-yellow fall foliage.
**OAKS**

*Quercus Palustra (Zone 4)*  
**Pin Oak**  
Height: 75'  
Spread: 35-40'  
Shape: pyramidal  
The distinctive pyramidal shape has dense, drooping branches and fine textured foliage.

*Quercus Robur Pyramich (Zone 5)*  
**Skymaster English Oak**  
Height: 50'  
Spread: 25'  
Shape: pyramidal  
An excellent selection of English Oak, well suited for use as a street tree. Narrow when young, becoming pyramidal with age. Skymaster has a strong central leader and excellent lateral branching structure.

*Quercus Rubra (Zone 4)*  
**Red Oak**  
Height: 60-75'  
Spread: 45-50'  
Shape: rounded  
A vigorous grower, withstands city conditions and dry, compacted soils. Leaves turn red in autumn.

**LINDEN**

*Tilia American Rosehill (Zone 3)*  
**Rosehill American Linden**  
Height: 60-80'  
Spread: 30-40'  
Shape: pyramidal, rounding with age  
American Linden that makes a handsome lawn or street tree.

*Tilia Cordata (Zone 3)*  
**Little Leaf Linden**  
Height: 50'  
Spread: 25-35'  
Shape: pyramidal  
A dense broad pyramidal form, does well under city conditions. The foliage turns golden-yellow in autumn. A fine tree for street or home use.

*Corinthia Greenspere (Zone 3)*  
**Greenspere Linden**  
Height: 50'  
Spread: 35'  
Shape: oval  
A rapid grower, with a narrow, oval head and straight trunk. Excellent for street tree or home plantings.

**OTHER**

*Celtis occidentalis*  
**Hackenberry**  
Height: 50’ – 60’  
Spread: 40’ – 60’  
Shape: broad oval  
Good in urban conditions; interesting corky bark.

*Lirodendrum tupilifera*  
**Yellow Tulip Poplar**  
Height: 80’ – 100’  
Spread: 40’  
Shape: upright oval  
Good in urban conditions; tall, beautiful shade tree
**Ulmus parvifolia “Emerald Vase”**  
Height: 50’  
Spread: 50’  
Shape: vase  
Majestic shape; exfoliating bark

**Ulmus davidiana “Accolade”**  
Height: 50’ – 60’  
Spread: 30’ – 40’  
Shape: vase  
Majestic shape; yellow fall color; good salt tolerance

**Gymnocladus dioica**  
Height: 60’ - 80’  
Spread: 40’ – 55’  
Shape: oval  
pH and salt tolerant

**Plantanus hispanica “Bloodgood”**  
Height: 65’  
Spread: 50’  
Shape: Oval  
Outstanding bark

**Emerald Vase Chinese Elm**  
Flower: none  
Fruit: small rounded; red  
Foliage: dark green

**Accolade Elm**  
Flower: none  
Fruit: small rounded; red  
Foliage: dark green

**Kentucky Coffeetree**  
Flower: white  
Fruit: long pods on female  
Foliage: green

**Bloodgood London Plane**  
Flower: inconspicuous  
Fruit: ½” – 1”  
Foliage: medium to light green

Any alternatives to these species shall be permitted with approval from the Town of Penfield Landscape Consultant.

### 13.4 WARRANTY

All plant materials shall be warranted for a period of two (2) years from the time of installation. All dead materials shall be replaced at the direction of the Town of Penfield. A two (2) year maintenance bond may be required after final acceptance.
14.1 GENERAL
All materials used in recreation facilities shall meet the requirements as specified, unless modified by notes shown upon the plans. In the absence of any specific reference to specifications, materials to be incorporated into any project and the work to be performed shall conform to the National Landscape Architect or National Arborist standards or as determined by the Director of Recreation and the Director of Public Works.

The design and construction of all recreational facilities shall be approved by the Director of Public Works. All playground and recreational equipment to be purchased and installed must meet all minimum requirements and conform to all guidelines as so directed by the U.S. Consumer Product Safety Commission (Washington, DC 20207).

14.2 SITE EXCAVATION
Clearing, grubbing, and the removal of sod and topsoil shall be stored for later use or placed in an embankment beyond site excavation limits. All stumps, brush, trees and other rubbish shall be disposed of in a manner satisfactory to the town. None of the above materials may be buried on site.

14.3 TENNIS AND BASKETBALL COURTS
All tennis and basketball courts shall be designed and constructed to conform to the following requirements:
- Regulation Tennis Court: 60' x 121'
- Regulation Basketball Court: 65' x 104'

All courts shall be laid out on a north - south alignment for proper orientation to the sun.

14.4 SUBBASE CONSTRUCTION
Underground utilities shall be constructed outside of pavement area.

A proper subbase shall be applied after existing topsoil is removed and twelve (12") inches of crusher run stone shall be placed and compacted in six (6") inch lifts with a heavy duty ten (10) ton roller. No subbase shall be put in over unstable trenches or soft spots. If this condition should arise, the soil shall be removed and filled with crushed run gravel. The developer is responsible for any settling in the finished pavement.

14.5 MATERIALS
The asphalt shall be applied in two (2) courses consisting of a two (2") inch binder course and a one (1") inch top course. The pavement shall be laid by an approved self-propelled asphalt paving machine manned by competent operators.

Each course will be compacted by rolling a ten (10) ton tandem roller at the appropriate time by a competent operator.

Before applying the top course, any irregularities found in the binder course shall be eliminated. At no time shall "cold patch" or winter mix be used for any purpose.

Protection of new pavement shall be provided until properly set.

The construction season shall run from May 15 - October 15. Exceptions may be made a day-to-day
basis when approved by the Director of Public Works.

All asphalt edges shall be properly trimmed, cut and squared.

14.6 FENCING
A standard nine (9) gauge, two (2") inch mesh hot dipped galvanized chain link fence shall be installed twelve (12') feet high along the entire perimeter of the asphalt surface. The fence shall be two (2") inches O.D. properly cemented three (3') feet deep with concrete. All corner posts shall be three (3") inches O.D. and one (1) gate with proper latch shall be installed. Fabric ties shall be number 6 gauge aluminum coated or galvanized wire or clips.

Fittings shall be hot dipped galvanized steel or malleable iron. All fittings necessary for complete installation shall be furnished.

Gates shall have a position latching device to accommodate a padlock and malleable iron ball and socket hinges with one-hundred eighty (180°) degree swing.

14.7 RECREATIONAL AMENITIES
Nets shall be forty-two (42') feet long nylon official heavy duty tennis nets with one and three-quarter (1 ¾") inch openings with a seven thirty-seconds (7/32") inch diameter galvanized or coated steel cable through the top binding.

Posts shall be three and one-half (3 ½") inch O.D. galvanized steel pipe, capped at top, to accommodate the net at official heights. There shall be one (1) ratchet reel per pair of posts.

Basketball backstops- posts, backboards and goals shall be complete with four and one-half (4 ½") inch O.D. galvanized steel posts with a four (4') foot extension, Twelve (12) gauge white enameled galvanized steel regulation fan shaped backboard and regulation orange enameled goals with double ring, double brace and steel chain net.

The backstop will include three (3) panels, each ten (10') foot wide x twelve (12') foot high, and shall be heavy duty and built for tough durability. All uprights will be three (3") inch heavy duty, galvanized pipe, cross ties are fabricated of one and one-quarter (1 ¼") inch heavy duty, galvanized pipe and the fence will be of nine (9) gauge chain link style.

Install posts truly vertical in concrete footings no less than eighteen (18") inch diameter by four (4') foot depth. Top of footings shall be flush with finished grade. Space posts as detailed, securely fasten rails to posts. Top rail shall pass through post caps to form continuous brace.

Attached fabric to end and corner posts with tension bars. Pull tightly and attach to line posts with ties spaced no more than fourteen (14") inches on center and attach to rails with ties spaced no more than two (2') feet on center.

14.8 COATINGS
A two (2) coat color application and pavement sealer shall be properly applied on a clean, well prepared surface. A two (2") inch white painted line shall be used for all regulation markings.

14.9 TOT LOTS
Tot lots shall be graded level with a minimum of six (6") inches of an approved safety surface approved by the Director of Public Works. All equipment shall be marked or stamped or approved to meet minimum Federal safety standards. The equipment shall be placed and spaced to minimize
maintenance and upkeep and to maximize the user safety at all times. The tot lot equipment shall be securely anchored and painted. All tot lots shall be located at a safe distance from roadways, utilities, drainage facilities and hazardous areas.

14.10 LAWN AREAS
The seeding and care of lawn areas is an important feature of well-developed recreational areas. The soil shall be properly prepared with correct fertilization and liming procedures. Suitable grasses or grass mixtures shall be selected and approved maintenance practices shall be followed by the developer after planting.

The construction site shall have adequate topsoil to provide for the growing and maintenance of turf in a normal and reasonable manner. The developer shall have a proper soil test and analysis made and submitted to the Director of Public Works.

All foreign material shall be removed from the soil before final grading and seeding, including construction debris, stones and roots.

All lawn areas shall be mulched to prevent soil erosion, particularly on slopes where potential excess drainage may occur.

The lawn areas shall not be accepted by the town until at least one (1) year after germination to assure healthy growth.

14.11 PLAYFIELD
All playfields shall be a minimum of two (2) acres and include a level and open grass area. This area will have a backstop for multi-use purposes. Also, good drainage and proper orientation to take the sun should be carefully observed. This area shall be properly seeded, mulched and fertilized as approved by the Director of Public Works.

14.12 PASSIVE RECREATIONAL AREA
Recreational areas can be established where the Planning Board determines that preservation of open space or wooded areas is desirable. These areas shall remain in their natural condition, except for any grading for drainage swales, piping, detention/retention basins, or water quality features. Markers shall be installed by the developer to denote the limits of the town property, where necessary.

14.13 TRAILS
All multi-use trails shall be a minimum of ten (10’) feet wide and shall be constructed of a six (6”) inch stone base with a durable surface. The layout and design shall include proper drainage and a surface that provided safe travel for pedestrians and wheeled, non-motorized vehicles. Gates or bollards shall be required at access points adjacent to roads or parking areas. Hiking trails shall be a minimum of six (6’) feet wide with a similar stone base.

14.14 PICNIC AREAS
Areas designated for passive recreational use shall include benches and tables.

14.15 BIKE FACILITIES
All sites shall include bike racks and other features to promote the use of bicycles.

14.16 WILDLIFE HABITAT
All sites shall include amenities to enhance and facilitate the existing wildlife habitat.
SECTION 15 - STREET LIGHTING

15.1 GENERAL
Any new development or subdivision being served by either a publically dedicated road, or private drive serving six (6) or more lots that enters onto a Town Collector Road, County or State Highway shall install a street light at that intersection. The cost of installation and connection of this street light shall be borne by the developer.

15.2 INSTALLATION (Townwide Lighting District)
The Town of Penfield Department of Public Works shall determine the layout of all lights and connection points associated with this installation, prepare necessary lighting layouts and make application to the local utility provider for energy delivery. It will be up to the developer to arrange for and fund the installation of said improvements at the direction of the Town of Penfield Department of Public Works. Wherever possible, street light installations shall make use of existing utility poles that are available near the intersection.

The criteria used for this type of installation shall be:
- Proximity of existing utility pole and their orientation to the new intersection
- Height of the utility pole – twenty-five (25') foot mounting height required
- Approval of owner of utility pole
- Proximity to secondary power supply
- Location of existing utilities on the pole

If this type of lighting installation is appropriate the following lighting materials shall be used:
- Mast Arm: Union Metal Model D200-S160, or approved equivalent.
- Fixture: Philips RoadFocus RFM-108W48LED4K-G2-R3M-UNV-DMG-PH8-RCD-GY3 cobra head, or approved equivalent.

Alternative Installation - Where an existing wooden utility pole is not available near the intersection or is deemed unsuitable for mounting a street lighting arm the alternate installation shall be used.
- One (1) - Shakespeare Composite Structures – Composite “Tuff Pole” (BS 18-01 S1 BE) - Direct Burial Smooth Black Fiberglass pole, or approved equivalent (Location to be determined by the Town of Penfield Department of Public Works).
- One (1) - Cooper Lighting –TRR-50-LED-E1-2-BK-R-S-8030-SH, or approved equivalent.
- One hundred ten (110) volt (secondary) power shall be run underground through a two (2") inch PVC conduit from the local utility provider’s distribution point to the new pole.
- Approved fiberglass pull boxes may be installed as required.

Note: The Town of Penfield Department of Public Works reserves the right to modify wattage, location and/or number of poles/luminaires required at a particular intersection based on intersection size or geometry.

15.3 INSTALLATION (Intensified Street Lighting District)
As specified in (Section on District Formation Process) when a Developer wishes to utilize Intensified Street Lighting within their development they must first petition and receive Town Board approval for the formation of an Intensified Street Lighting District. This decision whether to utilize Intensified Street Lighting will need to be made prior to Final Site Plan approval. Once the Intensified Street Lighting District has been formed the developer shall direct their Site Engineer to submit a lighting layout design for review by the Town of Penfield Department of Public Works. Along with the lighting layout design the developer shall submit the local utility provider’s layout for transformer placement within the development.
Note: The Town of Penfield’s Department of Public Works cannot complete their review until the local utility provider’s transformer layout has been submitted.

The Town of Penfield Department of Public Works shall be responsible for making application to the local utility provider for power supply and connection points.

After the Town of Penfield Department of Public Works has reviewed and approved the lighting layout design and associated appurtenances the developer shall arrange for installation of the same. Coordination of any roadway crossover pipes will need to be made prior to roadway construction.

The installation lighting equipment within the Intensified Lighting District shall consist of:
- One (1) Shakespeare Composite Structures – Composite “Tuff Pole” (BS 18-01 S1 BE) - Direct Burial Smooth Black Fiberglass pole, or approved equivalent.
- One (1) Cooper Lighting –TRR 50 LED E1 2 BK R S 8030 SH, or approved equivalent.
- Two (2”) inch – Schedule 40 or 80 polyvinyl chloride pipe (PVC) Electrical Conduit and associated fittings and long sweep elbows.
- Appropriate wire type & gauge.
- Approved fiberglass pull boxes may be installed as required.

15.4 RESPONSIBILITIES
In both lighting district cases, Townwide or Intensified, the Town of Penfield Department of Public Works shall determine the location, type and wattage of the light to be installed and will make necessary application to the local utility provider for “Energy Only” service.

For Townwide Street Lighting installations the Town of Penfield Department of Public Works will make necessary arrangements for the installation of lighting equipment at intersections. The cost of the material and installation shall be billed to the developer and reimbursed directly back to the Townwide Street Lighting District.

In the case of Intensified Street Lighting installations, the developer shall arrange for the design, purchase of material, and installation in accordance with these specifications and approved lighting plan. Inspection of Intensified Street Lighting installations shall be done by the Town of Penfield Department of Public Works and an authorized electrical inspection agency approved by the Town of Penfield in accordance with standards of the National Electric Code (NEC), National Electric Safety Code (NESC) and any other applicable electrical standards.

All installations shall be covered in a Letter of Credit to the Town of Penfield.
SECTION 16 - COMMERCIAL DEVELOPMENT

16.1 GENERAL
The design and construction of commercial parking lots shall be completed to insure adequate access for emergency vehicles and delivery vehicles, while preserving safe and efficient travel for the customers. Adequate drainage of impervious surfaces shall include a stormwater collection system that can treat and discharge stormwater in accordance with these design specifications.

16.2 PARKING LOTS
a) Parking aisles shall be a minimum of 24’ wide, unless designated as a Fire Lane, drop off lane, or delivery access.
b) Throat length at all access points to the highway system shall be designed to prevent any blockage of internal roadways at peak times.
c) Landscaped islands are required at the ends of alternating parking aisles and shall be designed with adequate radius for standard vehicles. Plantings in islands and at roadway access shall not interfere with sight distance.
d) Individual drainage collection structures (catch basins, spillways, etc.) shall have a maximum drainage area of 3 acres.
e) Parking stall dimensions shall meet requirements of the Town of Penfield Zoning Ordinance.
f) Parking lot slope shall not exceed 5% slope in any area, excluding access ramps.
g) Sidewalks located perpendicular to parking stalls shall be a minimum of 7’ wide. Vehicles shall not extend across property lines.
h) Pedestrian access shall be provided from the right of way to each building frontage with a sidewalk and crosswalk.
i) Each development shall include bike racks that are located in a safe and convenient location. Bike racks (minimum capacity of 5 bikes) shall be provided at a ratio of 1 per every 50 parking stalls.
j) All above grade utility service devices (meters, RPZ vaults, transformers, equipment, meters, etc.) shall be screened with fencing and/or landscaping.
k) A Property Maintenance Agreement is required for the perpetual maintenance of these facilities.

16.3 DUMPSTERS
All dumpsters shall be enclosed in an enclosure that matches the materials and appearance of the primary structure. The enclosure shall be sized to include all dumpsters, recycling containers and grease traps. The Town encourages developments to utilize shared dumpster facilities. The walls of the enclosures shall be a minimum of 1’ taller that the dumpsters. Dumpsters shall be located on a concrete pad that drains to the enclosed storm sewer system. Town reserves the right to require additional controls in the storm sewer system to protect storm sewers from conveying pollutants or debris from the dumpster.

16.4 LIGHTING
All lighting fixtures and poles shall be shown on the plans. This shall include all wall mounted fixtures. All fixtures shall be full cutoff units. Mounting height shall be determined based upon distance from residential development, but in no case shall exceed 30’. Lighting fixtures shall be located in landscaped islands, whenever possible. Lighting shall be unobtrusive to adjoining residential properties. Shields shall be installed where necessary, prior to Final Certificate of Occupancy.
Lighting fixtures shall consist of 80% cut off luminaires. Lighting design shall have a maximum uniformity ratio of 10:1. The Town of Penfield supports “Dark Sky” compliant fixtures whenever possible.

16.5 TRAFFIC CONTROL
A traffic control plan shall be included in all commercial and industrial developments. Plan shall show striping, signage, and control devices.

16.6 SHARED ACCESS
Cross Access Easements shall be provided to adjoining properties as required to encourage reduction in vehicular trips to the public roadways.

16.7 Pedestrian Circulation Plans
a) Shall be generated and submitted along with your application materials in Mixed Use Development areas, as per the latest adopted version of the Town of Penfield’s Mixed Use Development Manual.
SECTION 17 - RETAINING WALLS

17.1 GENERAL
All proposed retaining walls supporting more than four (4) feet of backfill height or any retaining wall supporting a surcharge load shall be reviewed and approved by the Town of Penfield Engineer prior to construction. Construction of such retaining walls requires a building permit from the Building Department.

The design engineer must submit engineering calculations and design drawings sealed by a Professional Engineer licensed in New York State. Design method shall be by any accepted standards for the materials chosen.

Where required by the town, a soil investigation report shall be completed to verify soil parameters.

17.2 MATERIALS
All proposed retaining walls supporting more than four (4) feet of backfill height shall be manufactured of reinforced concrete, segmented masonry units, or gabions. All segmented retaining walls shall have a positive interlocking mechanism between courses, including, but not limited to reinforcing bars or fiberglass pins.

The walls shall be constructed to provide a properly drained backfill. All backfill shall be compacted in accordance with accepted standards.

All geosynthetic reinforcement shall be installed in accordance with the manufacturer’s requirements. No utilities shall be installed within the limits of the reinforcement. In addition, no poles, lighting, foundations or guiderail shall be installed that intersects the geosynthetic reinforcement.