The Monroe County Monumentation Law:

A Guide for Land Surveyors

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HISTORY OF THE MONROE COUNTY GEODETIC MONUMENTATION NETWORK

MONROE COUNTY'S NEW MONUMENTATION LAW –ROCHESTER AND ENVIRONS

As published in the ACSM BULLETIN, Summer Issue, 1972

In 1875, four U.S. Lake survey Triangulation Stations were placed in Monroe County. During the depression years 1932 to 1941, thirteen additional triangulation stations and some 1,300 secondary traverse stations were placed. World War II brought an end to the program.

No legislation had been passed requiring the use of the network. Even though Monroe County then was among the best in distribution of horizontal and vertical control monuments in the United States, the control network was rarely used, except for vertical control. Often as not, the availability of vertical control was disregarded in favor of assumed elevations.

Since there was no legislation and no office directly responsible for the protection and maintenance of the network, an estimated one-third of the total network had been destroyed by 1969, when the county contracted with the U.S. Coast and Geodetic Survey (now the National Geodetic Survey) to install and triangulate a total of 90 stations, including those that still existed. While the USC&GS personnel occupied the observation towers, Monroe County and its consultant provided a total of eight people to tie in 211 easily accessible traverse stations which had been placed along the rights-of-way of roads nearby.

The newly created Monroe County Geodetic Survey Office was given the responsibility for maintenance and densification of the network. About 175 new and existing stations were traversed during the 1970 and 1971 seasons. This has been done by first-order, second-class standards and procedures to a precision of 1:50,000 or better. All field notes and office work are sent to NGS for verification and eventual publication.

The Monroe County Geodetic Survey Monumentation Law was passed to assure the protection, use and maximum benefit of the system. All surveyors working in Monroe County are urgently requested to contact the office for the latest information.

The original Monroe County Geodetic Survey Monumentation Law, Local Law No. 6 of 1971 adopted by the Monroe County Legislature December 23, 1971 has remained unchanged until 2019. In 2019 the law was revised and is now known as the Monroe County Monumentation Law, Local Law No. 6 of 2019 adopted by the Monroe County Legislature June 11, 2019. Revisions were made in year 2019 to address the many changes in surveying technology and capabilities as well as penalty levels.

Intro. No. 133

LOCAL LAW NO. 6 OF 2019
(As Amended by Motion No. 23 of 2019)

AMENDING LOCAL LAW NO. 6 of 1971, ENTITLED "LOCAL LAW REGULATING THE USE AND PROTECTION OF MONROE COUNTY GEODETIC SURVEY MONUMENTATION NETWORK"

BE IT ENACTED BY THE LEGISLATURE OF THE COUNTY OF MONROE, as follows:

Section 1. Short Title
This local law shall be known as the "Monroe County Monumentation Law".
Section 2. Text

1. Purpose and Intent
2. Definitions
3. Scope of Regulation
4. Preservation of Geodetic Monuments
5. Use of Geodetic Network
6. Rules and Regulations
7. Enforcement
8. Violations and Penalties
9. Appeals
10. Separability

1. Purpose and Intent

The provisions herein contained are for the purpose of establishing standards for the use of the Monroe County Geodetic Monumentation Network and for the purpose of maintaining monuments in such Network in order to insure their continued use as accurate survey markers.

2. Definitions

When used herein unless otherwise expressly stated, the following terms shall mean:

"Director" – The County of Monroe County Surveyor or his or her Duly authorized representative.

"Azimuth" – The horizontal direction of a line.

"Azimuth Mark" – A point, usually a monument used primarily to establish the reference Azimuth from a Triangulation Station.

"Control or Geodetic Monument" – Any geodetic monument, the location of which has been established to a high degree of accuracy, and used as a control point to which surveys of lesser accuracy may be tied.

"Coordinates" – Values designating the location of a point relative to the location of all other points in a given frame of reference. In this law only the New York State Plane Coordinate System of 1927 or 1983, West Zone is intended as the frame of reference.

"Destruction of a Monument" – Since any movement of a monument destroys its usefulness, disturbance of a monument shall be equated with destruction.

"Developer" – Any person, company, corporation, or governmental agency or authority who themselves undertake or who let contracts for, a building project, or provide public services in the areas of gas, electric, telephone, water, transportation, or sewers, whether by distribution or transmission.

"Geodetic Control Network or Network" – The system of monumented, coordinated points established by the office of National Geodetic Survey (NGS), formerly known as the United States National Ocean Survey and United States Coast and Geodetic Survey, and by other governmental agencies and extended or maintained by the Monroe County Surveyors Office.

"Horizontal Control" – The basic framework of points whose horizontal position and interrelationship have been accurately determined so that the location of subsidiary work may be precisely related to the network.

"Intersection Station" – A visible distant object such as water tanks, church spires, smoke stacks whose Azimuth from a given monument has been previously established.

"Reference Markers" – Those monuments in the vicinity of a Triangulation Station which are placed and carefully tied to the Triangulation Station for the purpose of protection and easy recovery of the Triangulation Station.

"Traverse Station or Monument" – A monumented point easily accessible to engineers and surveyors, and which is a part of the geodetic control network.

"Triangulation Station or Monument" – A point of permanent reference, usually a buried Portland cement concrete mass atop which is fixed an indexed brass marker, usually located in a relatively isolated, well-protected area, the location relative to the geodetic control network having been established by first order methods to an accuracy of not less than 1 part in 100,000, by National Geodetic Survey (NGS), formerly known as the United States National Ocean Survey and United States Coast and Geodetic Survey.

"Vertical Control" – Same as Horizontal Control except that its purpose is to establish elevation above a common datum (mean sea level or orthometric height) so that such information on all projects will be related.

3. Scope of Regulation

The Director is empowered to and shall review, evaluate and approve all plans of proposed development, utility installations and construction within public rights of way within the County of Monroe where a geodetic monument may be involved, or in any area within the County where a Triangulation Monument may be involved, and all subdivision and resubdivision maps to be filed in the Monroe County Clerk's Office for conformance with the stated purpose and intent of this law.

4. Preservation of Geodetic Monuments

It shall be the responsibility of the Developer to utilize the Monroe County GIS based internet monument web viewer for monument inventory and record information, or request of the Director exact information as to the location of monuments in the vicinity of the project. All Traverse Monuments which are in or near the right of way encompassed by the project or Triangulation Monuments and their Reference Markers and Azimuth Marks anywhere within the projects shall be shown on all plans of the project which shall be submitted to the Director for approval.

It shall be the responsibility of the Developer to protect said monuments in a manner which shall ensure their protection against damage or destruction in a manner acceptable to the Director.

Where the design of a project is such that a Control Monument must be destroyed, a note to that effect shall appear on the plans submitted for approval to the Director, who shall cause such monuments to be reset by the Developer in such a place or manner as to ensure their preservation and future usefulness. The monument must be reset by and under the supervision of a New York State Licensed Land Surveyor at a location acceptable to the Director and in accordance with the requirements of the Monroe County Surveyors Office.

5. Use of Geodetic Network

It shall be the responsibility of the Developer to utilize the Monroe County GIS based internet monument web viewer for monument inventory and record information, or request of the Director exact information as to the location of monuments in the vicinity of the project to determine if at least

one of two or more monuments, or one monument with azimuths of record to intersection stations, or one single monument is within 5,000 feet of the project except that where the entire project involves not more than five residential lots the maximum distance is 2,500 feet. The distance from the nearest monument is the shortest practical route along rights-of-way or through other public properties. If such survey control exists, the Developer shall tie the boundaries into the horizontal control as established by said monuments.

The acceptable error in the accuracy of the field survey necessary to establish the property boundaries and the ties to geodetic monuments when employing conventional Theodolite or Total Station Terrestrial Positioning Survey (TPS) techniques shall not be greater than one part in twenty thousand (1:20,000) proportional accuracy or a Local Positional Accuracy (at two sigma, 95% confidence level) not exceeding 0.025 feet.

The acceptable error in the accuracy of the field survey necessary to establish the property boundaries and the ties to geodetic monuments when employing Global Positioning Survey (GPS) survey techniques localized to passive geodetic monuments, must not be greater than one part in twenty thousand (1: 20,000) proportional accuracy or a Local Positional Accuracy (at two sigma, 95% confidence level) not exceeding 0.025 feet.

The acceptable error in the accuracy of the field survey necessary to establish the property boundaries and the ties to geodetic monuments when employing Global Positioning Survey (GPS) survey techniques to establish NAD 83 datum, must not be greater than one part in twenty thousand (1: 20,000) proportional accuracy or a Local Positional Accuracy (at two sigma, 95% confidence level) not exceeding 0.025 feet and a Network Positional Accuracy (at two sigma, 95% confidence level) not exceeding 0.05 feet.

For the survey method employed a certification statement to that effect by a New York State Licensed Land Surveyor shall appear on the plat of the survey. A minimum of three corners of the boundaries of the project shall show the coordinates of said points as reduced to grid. The coordinates shall be in the New York State Plane Coordinate System of 1927 or 1983, West Zone, Transverse Mercator Projection as established by National Geodetic Survey and expanded by the Monroe County Geodetic Survey. Datum used for vertical control shall be identified on the plat.

Where a Developer's project involves easements and/or the installation of underground facilities, the easement boundaries shall be coordinated and certified to in the same manner as property boundaries. "Record Plans" must include coordinates of the beginning, the end and all points where a change of direction occurs in the underground facility and be surveyed and certified to in the same manner as property boundaries. The survey shall be of sufficient accuracy to assure maximum safety to those facilities when additional facilities are installed nearby

6. Rules and Regulations

The Director shall prescribe orders of procedure, rules, regulations and issue technical criteria to carry out the purpose and intent of this law. A copy of such orders, rules, regulations and criteria shall be filed with the Clerk of the County Legislature and shall be available for inspection to the public.

7. Enforcement

Wherever it appears, in accordance with the provisions of this law, that geodetic survey monuments installed or employed by the County of Monroe that are part of the Geodetic Control Network are in danger of being damaged, destroyed or removed by the Developer, the Director may require a security deposit in the amount of Three Thousand Dollars ($3,000) per monument to be posted with and approved by the Director, said security deposit to be subject to forfeiture if in the opinion of the Director there is adequate proof that the provisions of this law have been violated. The Director may issue notices and stop-work orders with respect to acts of violation during the progress of any project. No plat shall be filed in the office of the Monroe County Clerk unless the provisions of this law have been complied with and such compliance is noted in writing by the Director.

8. Violations and Penalties

(a) Any violation of or non-conformance with any provision of this law, or of any rule, regulation, order or special direction duly made thereunder shall constitute an offense punishable for each offense

by a fine not exceeding $3,000 or by imprisonment for each offense not exceeding one hundred fifty (150) days, or by both such fine and imprisonment.

(b) Any Developer violating or failing to comply with any provision of this law or any order made pursuant thereto shall be responsible for any damages resulting therefrom to geodetic survey monuments, installed or employed by the County of Monroe or National Geodetic Survey that are part of the Geodetic Control Network. This money may be collected by civil action in the City Court of the City of Rochester, the County Court of the County of Monroe or the Supreme Court of the State of New York. Obedience to the law may also be enforced by injunction. Every day of such violation or failure may be held to constitute a separate offense. Nothing herein contained shall be construed to exempt an offender from any other prosecution or penalty provided by law.

9. Appeals

There shall be created a Board of Appeals to consist of three members who shall be appointed by the County Executive and who shall serve at the County Executive's pleasure. Such members shall be land surveyors duly registered to practice land surveying within the State of New York.

Any decision made by the Director pursuant to this law shall be submitted to review by the Board of Appeals upon written petition filed by the aggrieved party. Such petition shall be served on the Director and the Clerk of the County Legislature within thirty (30) days of the receipt of the disputed decision. The Board is empowered to establish rules of order and regulations pursuant to which it will carry out its functions as a review board.

10. Separability

If any section of provision of this law shall be adjudged by any court of jurisdiction to be invalid, such judgment shall not affect, impair or invalidate the remainder of this law, but shall be confined in its application to the work, clause, section or provision directly involved on which such judgment shall have been rendered.

Sec. 3. This local law shall take effect upon filing in the office of the Secretary of State as provided by Section 27 of the Municipal Home Rule Law.

MONROE COUNTY MONUMENTATION LAW

RULES & REGULATIONS OUTLINE

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   - A. Intent of Rules & Regulations – Limitations of Rules & Regulations
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I. INTRODUCTION

The intent of these rules and regulations is to set forth criteria to enable the Director to adequately administer Local Law No. 6 of 2019 regulating the use and protection of the Monroe County Geodetic Monumentation Network in the best interest of the public at large and for conformance with County of Monroe Real Property Services and New York State Real Property Law subdivision map filing requirements.

No statement made herein shall be interpreted to preclude or limit the professional prerogatives of the licensed land surveyor. What is intended is that the public control base survey, where available, be protected and used as a professional tool to aid the community in orderly growth.

The base control survey system as further described herein is of sufficient accuracy that when properly used as reference, land measurement inconsistencies will be greatly reduced. The general requirement for recording in the coordinate system will facilitate reproducible land surveys. Public benefits in tax mapping, determination of political boundaries, improved application of photogrammetry, lidar and geospatial imagery, and increased safety of underground installations are also expected.

The rules and regulations must be considered as being subject to periodic revision as directed by experience with the program and as advancements in survey equipment and software technology and capabilities develop. Revision of Rules and Regulations may be recommended by the Director, but authority for making revision is vested in the Office of the County Executive upon advice from the Board of Appreals. Should it become necessary to amend Local Law No. 6 of 2019, the authority for same rests entirely with the Monroe County Legislature.

II. GLOSSARY OF TERMS

In addition to definitions given in the law, the following terms are used in the Rules and Regulations as defined below:

"Monumentation Law" -Namely Local Law No. 6 of 2019, adopted by the Monroe County Legislature June 11, 2019.

"Of Record" -Information on file with the Director, County Clerk or other public office or agency.

"Parcel" -Any land which is being surveyed for determination of boundaries, easements, rights-of-way or public or private utility underground facilities.

"MCSO" -Namely the "Monroe County Surveyors Office", an office of Real Property Services, Department of Finance.

"Director" -The County of Monroe County Surveyor or his duly authorized representative.

"Developer" -Any person, company, corporation or governmental agency or authority who themselves undertake or who let contracts for, a building project, or provide public services in the areas of gas, electric, telephone, water, transportation, or sewers, whether by distribution or transmission.

"Emergency" -Only those projects which call for immediate action to prevent loss of life or property.

"Map" -Subdivision Map, Resubdivision Map, County Highway Right-of-Way Acquisition Map, County Property Acquisition or Conveyance Map, County Easement Acquisition or Conveyance Map.

"Monument" -County of Monroe, State of New York or United States Government geodetic survey monument.

"Intersection Station"- A visible distant object such as water tanks, church spires, smoke stacks whose Azimuth from a given monument has been previously established.

II. GLOSSARY OF TERMS (CON'T)

"Passive Monument"-Geodetic control monument that is not an active CORS station.

"Local Accuracy" -The Local Accuracy of a control point is a value that represents the uncertainty in the coordinates of the control point relative to the coordinates of the other directly connected, adjacent control points at the two sigma, 95 percent confidence level.

"Network Accuracy" -The Network Accuracy of a control point is a value that represents the uncertainty in the coordinates of the control point with respect to the geodetic datum at the two sigma, 95 percent confidence level.

"NAD83 Realization" -Datum tag for year datum adjustment was completed.

III. MONUMENTATION NETWORK SCOPE AND AVAILABLE DATA

(A) MONUMENT AVAILABILITY

At the time of Legislative adoption of the monumentation law in 1971, approximately 2,000 control monuments existed in Monroe County. In the following years the monument network was densified and consisted of approximately 5,700 monuments. These include First Order Triangulation Stations placed by the U.S. Coast & Geodetic Survey, Second and Third Order Traverse Stations placed during the mid to late 1930's and early 1940's, First and Second Order leveling stations placed by the U.S. Coast & Geodetic Survey, Second Order Stations placed by the Corps of Engineers, Highway Control survey monuments placed along major roads by the N.Y. State Dept. of Transportation and monuments placed by the Monroe County Surveyors Office (MCSO).

The Director will schedule monumentation densification as needed on a public benefit priority basis. In general, priority will be established with greatest consideration given to areas of most rapid development and pending public works projects.

The Director or his authorized representative may upon receipt of resolution, petition or other request modify this schedule to extend control survey to an area of interest to others. Such requests would be considered on the basis of public benefit derived thereby and would include magnitude and complexity of the proposed project, public or private project funding and scope work involved by MCSO to provide service.

(B) AVAILABLE DATA

MCSO will maintain a GIS based internet monument web viewer showing general location of all monuments of record within the Monroe County Monumentation Network which may be used by the public to determine approximate availability of monuments to the project or general susceptibility of monument endangerment by the project.

MCSO will maintain a separate file of each monument of record on data sheets. These data sheets will give specific information on location of monument and available current information on horizontal position and elevation above vertical datum all referenced to date of survey. Data sheets are accessible at the GIS based internet monument web viewer.

NGS (National Geodetic Survey) maintains an internet monument web viewer referred to as the "National Geodetic Survey Data Explorer" that provides additional monument locations.

The public may obtain information at any time through the MCSO GIS based internet monument web viewer, the NGS internet monument web viewer, or from MCSO during regular County of Monroe business hours without charge. The Director does, however, reserve the right to charge a nominal fee for researching, printing and other costs associated with making copies or electronic transmission of material available.

IV. PRESERVATION AND PROTECTION OF MONUMENTS

The administration of the law to preserve and protect the Monroe County Geodetic Monumentation Network will be accomplished by the Director through subdivision and resubdivision map, site plan and construction plan review, along with a coordinated effort between the Department of Transportation, Division of Project Planning and Administration and the MCSO, and through the following requirements. The continued existence of every monument is of importance to the value and integrity of the entire monument network. Since the inception of the Monroe County Monumentation Law the monuments have been

utilized to position countless subdivision developments throughout the County. As a result the monuments have significant subdivision survey retracement value. In consideration of the significance of the monuments, no monument may be destroyed except at the discretion of the Director.

It is the responsibility of the Developer to determine the availability of monuments for his project by utilizing the Monroe County GIS based internet monument web viewer for monument inventory and record information, and the NGS (National Geodetic Survey) internet monument web viewer referred to as the "National Geodetic Survey Data Explorer, or by contacting the Monroe County Surveyors Office.

Where monuments exist in or near proposed construction areas, they must be protected by substantial fencing, sheeted trench and/or other suitable means to insure their preservation. If a monument is disturbed or destroyed without written permission from the Director, the Developer is liable under the provisions of the law.

Where a monument is, or may be threatened with disturbance or destruction in the course of construction of a project, but the plans of said project call for its preservation, the Director may require a security deposit in the amount of $3,000.00 as referred to in Section 2, Paragraph 7 of the Monumentation Law.

The Director may require monument monitoring be performed in accordance with County of Monroe requirements, to be conducted before and after construction to verify any disturbance of the monument as defined in the MCSO regulations.

The Developer may, on completion of the project request return of his security deposit after verification that the monument has not been disturbed has been provided to the County Surveyor for review and acceptance.

The Director shall, within 30 days after receipt of the request:

1. Verify that the monument in question has not been disturbed or destroyed, and authorize return of the security deposit to the Developer.
2. Find that the monument has been disturbed or destroyed, in which case the Developer's security deposit is forfeit as referred to in Section 2, Paragraph 7 of the Monumentation Law.

The Developer may request permission to replace and/or re-coordinate a monument which has been disturbed or destroyed in the course of construction. Permission may be granted by the Director, subject to replacement and/or re-coordination

of the monument being accomplished under the supervision of a land surveyor licensed by the State of New York, by field and office procedures acceptable to the Director, and subject to checking and/or review by the MCSO under the supervision of a land surveyor licensed by the State of New York.

Triangulation Stations and their Reference and Azimuth marks must be replaced and re-coordinated only by MCSO or the National Geodetic Survey at the discretion of the Director or National Geodetic Survey. The Developer is liable for the cost to the County and/or the cost charged by National Geodetic Survey for the replacement and/or re-coordination of these disturbed or destroyed monuments.

Since the network of geodetic survey control monuments follow state, county and town roads and the law makes no distinctions relative to their location, all such monuments are within the purview of the law and these Rules and Regulations.

When emergency work is done, these rules and regulations do not apply except that the Developer must report to the MCSO, exposure, disturbance or destruction of a monument.

No penalties will be imposed for damage caused by emergency work.

V. RULES ON USE OF THE MONUMENTATION NETWORK

The administration of the law for utilization of the Monroe County Geodetic Monumentation Network will be accomplished by the Director through Subdivision Map, Resubdivision Map, County Highway Right-of-Way Acquisition Map, County Property Acquisition or Conveyance Map, County Easement Acquisition or Conveyance Map review and approval prior to the map being filed or recorded with the County Clerk and through the following requirements:

a. It is the responsibility of the Developer to determine the availability of monuments for his project by utilizing the Monroe County GIS based internet monument web viewer and the NGS (National Geodetic Survey) internet monument web viewer referred to as the “National Geodetic Survey Data

Explorer" for monument inventory and record information, or by contacting the Monroe County Surveyors Office.

b. Projects must be tied into the Monroe County Geodetic Monumentation Network if at least one of two or more monuments, or one monument with azimuths of record to intersection stations, or one single monument is within 5,000 feet of the project except where the project involves not more than 5 lots the maximum distance is 2,500 feet.

c. The maximum tie in distance from the nearest monument is the shortest practical route along rights-of-way or through other public properties.

d. Monuments closest to the site shall be utilized for network tie in purposes. If the Developer extends his survey to tie into monuments beyond the required tie in distance the map must provide measured coordinates for the two closest monuments within the required tie in distance where they are available.

e. The first monument listed is the monument nearest the Project.

f. The monuments held to establish the geodetic datum must be indicated and any positional variance with published positions noted for monuments listed.

g. If the Developer positions his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques the map must provide measured coordinates for monuments within the required tie in distance.

h. Alternate survey control points such as positioned construction baseline control points, positioned highway permanent survey markers or nearby non adjacent reference surveys or subdivisions cannot be used as a substitute for tying into Monroe County network geodetic monuments located within the maximum tie in distance. The aforementioned alternate survey control points can be utilized to position a subdivision in the absence of Monroe County network geodetic monuments.

i. If a monument of record falls within the normal scale distance delineated by the map of survey, the monument must be plotted and identified thereon.

All Subdivision Maps, Resubdivision Maps, County Road Right-of-Way Acquisition Maps, County Property Acquisition or Conveyance Maps, other County Easement Acquisition or Conveyance Maps conveying rights to or from the County of Monroe, prior to being filed or recorded with the County Clerk must be reviewed by the Director and he must attest by his signature, on that Subdivision Map, Resubdivision Map, County Road Right-of-Way Acquisition Map to be filed or recorded, that the conditions of the Law have been satisfied. The Developer must provide the following information on his map:

(See page 26 for acceptable complete notation formats)

(A) NO MONUMENT OF RECORD WITHIN REQUIRED DISTANCE:

(1) Survey Not Extended to tie into the Monroe County Geodetic Monumentation Network:

Where distance from the nearest corner of the parcel to a monument of record exceeds the requirement distance set forth in the law and the Developer declines to extend his survey or position his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, he must attest to this on the map by the following notations, be certified to by a New York State Licensed Land Surveyor, and no coordinates of any kind may appear on said map.

“This project is more than 2,500 feet (or 5,000 feet if more than 5 lots) from the nearest Geodetic Survey Monument and therefore is not tied into the Monroe County Geodetic Monumentation Network.”

For traditional Terrestrial Positioning Surveys (TPS):

“The project boundary survey was made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet.

For Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques establishing NAD83:

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet and a Network Positional Accuracy at 95% confidence level not exceeding 0.05 feet.

"The Combined Scale Factor is:"

"Map distances shown are (indicate ground or grid) level dimensions."

(2) Where vertical base datum reference monumentation is beyond the distance prescribed by law and the Developer declines availing himself of vertical control from beyond said prescribed distance, a base reference above mean sea level or orthometric height must be assumed from data taken from U.S. Geological Survey Quadrangle Maps, County of Monroe Photogrammetric Maps, County of Monroe Lidar or bench marks supplied by private or government offices or similar reference. A notation of such assumption must appear on the appropriate map for filing giving the location of said assumed mark, date of survey and source of reference. In no case will an arbitrarily assumed datum reference be accepted.

(3) Survey Extended to tie into the Monroe County Geodetic Monumentation Network:

Where distance from the nearest corner of the parcel to the monument of record exceeds the requirement distance set forth in the law and the Developer extends his survey or positions his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the Developer must attest to this on the map by following the requirements and notations in accordance with below Section B-1 Two or More Monuments of Record, provide reference source for coordinates and be certified to by a New York State Licensed Land Surveyor.

(B) MONUMENTS OF RECORD WITHIN REQUIRED DISTANCE:

(1) Two or More Monuments of Record

Where monuments of record are within the prescribed maximum distance set by law, the Developer must attest to this on the map by the following requirements and notations, and certified to by a New York State Licensed Land Surveyor.

The map must, in addition to reporting horizontal control as required herein, report the source of reference monuments utilized by providing the full monument name, coordinates with published or adjustment date and elevation or orthometric height with reference datum as shown on the monument data tie sheet.

The coordinates of the project shown on the map must be calculated with consideration for reduction to sea level and grid scale, and the map must indicate the grid factor and elevation factor, or a combined factor. However, distances shown on the map of survey must be reduced to horizontal ground distances at the elevation or orthometric height of the project as is presently customary.

Coordinates for a minimum of three corners of the subject parcel boundaries or easement boundaries on the map must be shown.

In all cases where a parcel is to be tied into the network when employing traditional Terrestrial Positioning Survey (TPS) methods, a closed traverse must be run between the control monuments and the parcel.

Required Notations:

“The Developer’s and Contractor’s attention is directed to Local Law No. 6 of 2019 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments.”

“The Developer and Contractor must locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office website and access the GIS based internet web viewer, or contact the Monroe County Surveyors Office.”

“This project is less than 2,500 feet (or 5,000 feet if more than 5 lots) from the nearest Geodetic Survey Monument and this project is tied into the Monroe County Geodetic Monumentation Network.”

“The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1927, West Zone, Transverse Mercator Projection, NAD 27 through control ties to the following geodetic monuments:”

OR

"The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1983, West Zone, Transverse Mercator Projection, NAD 83 (Indicate Realization) through control ties to the following geodetic monuments:"

OR

"The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1983, West Zone, Transverse Mercator Projection, NAD 83 (2011) utilizing Global Positioning System (GPS) (or) Global Navigation Satellite System (GNSS) observations from the NYSDOT Reference Network CORS Station (Indicate Station Name survey is fixed to) with control ties to the following geodetic monuments:" (Where geodetic monuments are available within the maximum tie in distances)

OR

"The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1983, West Zone, Transverse Mercator Projection, NAD 83 (2011) utilizing Global Positioning System (GPS) (or) Global Navigation Satellite System (GNSS) observations from the NYSDOT Reference Network CORS Station (Indicate Station Name survey is fixed to)" (Where geodetic monuments are not available within the maximum tie in distances)

For traditional Terrestrial Positioning Surveys (TPS):

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet."

For Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques localized to passive geodetic monuments:

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet."

For Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques establishing NAD83:

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000

(1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet and a Network Positional Accuracy at 95% confidence level not exceeding 0.05 feet.

“The Combined Scale Factor is:”

“Map distances shown are (indicate ground or grid) level dimensions.”

(2) One Monument & Intersection Station

Where a monument of record is within the prescribed maximum distance set by law and an Intersection Station of Record is visible both from the monument and from one or more corners of the parcel, the intersection station may be used for traverse closure.

The Developer must attest to this on the map by following the requirements and notations in accordance with above Section B-1 Two or More Monuments of Record, and be certified to by a New York State Licensed Land Surveyor.

(3) One Monument of Record

(a) Survey Not Extended to tie into the Monroe County Geodetic Monumentation Network:

Where a monument of record is within the prescribed distance from a parcel, and no other monument or intersection station is available for a back azimuth and the Developer declines to extend his survey or position his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the surveyor must choose a visible structural object when present or alternately the best available point with the most likely permanence for a back azimuth and describe it on the map with sufficient detail to assure reproducibility of his survey. No coordinates of any kind may appear on said map.

The Developer must attest to this on the map by the following requirements and notations and be certified to by a New York State Licensed Land Surveyor.

The map must, in addition to reporting horizontal control as required therein, report the source of reference monument utilized by providing the full monument name, coordinates with publish or adjustment date and elevation or orthometric height with reference datum as shown on the monument data tie sheet.

A schematic drawing of tie from the existing monument and object used for a backsight must be shown on the map. See below (4) for acceptable example of schematic format.

Required Notations:

"The Developer's and Contractor's attention is directed to Local Law No. 6 of 2019 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments."

"The Developer and Contractor must locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office website and access the GIS based internet monument web viewer, or contact the Monroe County Surveyors Office."

"This project is less than 2,500 feet (or 5,000 feet) from the nearest Geodetic Survey Monument and this project is tied into the Monroe County Geodetic Monumentation Network."

"Only one geodetic survey monument is available within 2,500 feet (or 5,000 feet), therefore no coordinates are provided."

"The project boundary survey and ties to the geodetic monument were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet."

(b) Survey Extended to tie into the Monroe County Geodetic Monumentation Network:

Where a monument of record is within the prescribed distance from a parcel, and no other monument or intersection station is available for a back azimuth and the Developer extends his survey or positions his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the Developer must attest to this on the map by following the requirements and notations in accordance with above Section B-1 Two or More Monuments of Record, provide reference source for coordinates and certified to by a New York State Licensed Land Surveyor.

(4) Use of Monuments of Record Having Limited Information

(a) One Monument and Survey Not Extended to tie into the Monroe County Geodetic Monumentation Network:

Where a non-coordinated monument is the only monument within the prescribed distances, and the Developer declines to extend his survey or position his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the surveyor must choose a visible structural object when present or alternately the best available stable survey point with the most likely permanence for a back azimuth and describe it on the map with sufficient detail to assure reproducibility of his survey. No coordinates of any kind may appear on said map.

The Developer must attest to this on the map by the following requirements and notations, and be certified to by a New York State Licensed Land Surveyor.

The map must, in addition to reporting horizontal control as required therein, report the source of reference monument utilized by providing the full monument name, and indicate no data available as shown on the monument data tie sheet.

A schematic drawing of tie from the existing monument and object used for a backsight must be shown on the map. See below for acceptable example of schematic format.

Required Notations:

"The Developer's and Contractor's attention is directed to Local Law No. 6 of 2019 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments."

"The Developer and Contractor must locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office website and access the GIS based internet web viewer, or contact the Monroe County Surveyors Office."

"This project is less than 2,500 feet (or 5,000 feet) from the nearest Geodetic Survey Monument and this project is tied into the Monroe County Geodetic Monumentation Network."

"Only one geodetic survey monument is available within 2,500 feet (or 5,000 feet) and does not have a published coordinate, therefore no coordinates are provided."

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet."

(b) Two or More Monuments and Survey Not Extended to tie into the Monroe County Geodetic Monumentation Network:

Where two or more non-coordinated monuments are the only monuments within the prescribed distances and the Developer declines to extend his survey or position his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the surveyor must tie into the monuments in the same manner required for coordinated monuments by following the requirements in accordance with above Section B-1 Two or More Monuments of Record. No

coordinates of any kind must appear on said map. Coordinates can be calculated for the project when coordinates have been established for the monuments. The Developer must attest to this on the map by the following requirements and notations, and certified to by a New York State Licensed Land Surveyor.

The map must, in addition to reporting horizontal control as required therein, report the source of reference monuments utilized by providing the full monument name, and indicate no data available as shown on the monument data tie sheet.

A schematic drawing of tie from the existing monuments must be shown on the map. See below for acceptable example of schematic format.

Required Notations:

"The Developer's and Contractor's attention is directed to Local Law No. 6 of 2019 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments."

"The Developer and Contractor must locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office website and access the GIS based internet web viewer, or contact the Monroe County Surveyors Office."

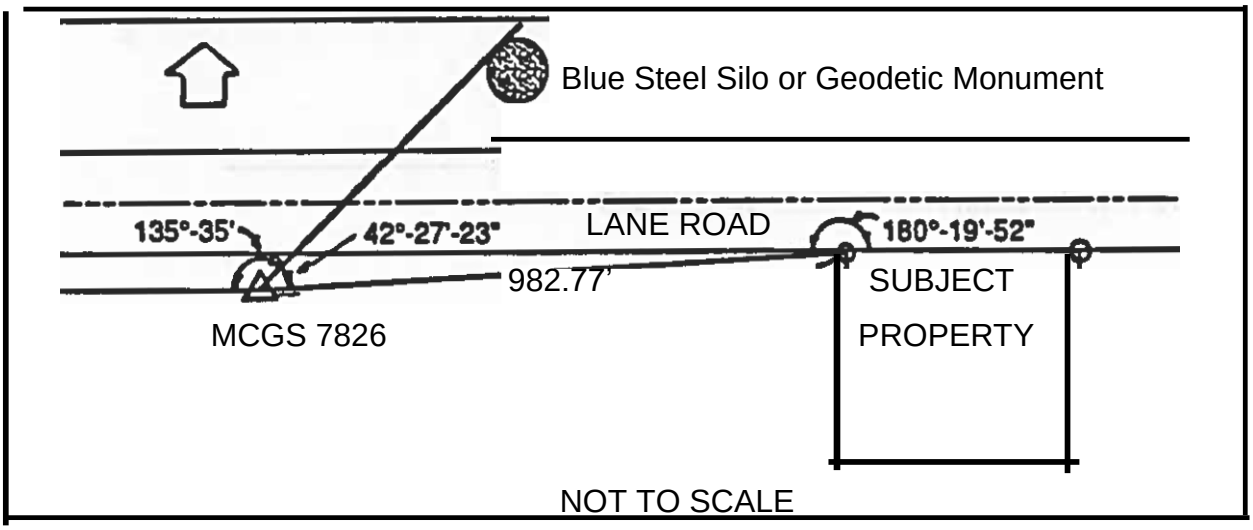
"This project is less than 2,500 feet (or 5,000 feet) from the nearest Geodetic Survey Monument and this project is tied into the Monroe County Geodetic Monumentation Network. The monuments do not have a published coordinates, therefore no coordinates are provided."

"The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet."

(c) Survey Extended to tie into the Monroe County Geodetic Monumentation Network:

Where one or two or more non-coordinated monuments are the only monuments within the prescribed distances and the Developer extends his survey or positions his survey through the employment of Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques in order to report the parcel in the prescribed horizontal coordinate system, the Developer must attest to this on the map by following the requirements and notations in accordance with above Section B-1 Two or More Monuments of Record, provide reference source for coordinates and certified to by a New York State Licensed Land Surveyor.

Acceptable Schematic Format for Showing Geodetic Survey Monument(s) Used In Tying a Project Into the Monroe County Geodetic Monumentation Network



(5) Special Cases

(a) Parts of Larger Tracts

Where a map delineates a parcel, tract or easement which is beyond the maximum distance from the nearest monument, as defined in the law and these Rules and Regulations, but is a part or section of a parcel or tract of land in the same ownership, a corner of which is within the prescribed distances from the nearest

monument, the parcel delineated by the map must be tied in as if it were within the prescribed distances.

The Developer must attest to this on the map by following the requirements and notations in accordance with Section B Monuments of Record Within the Required Distance, and be certified to by a New York State Licensed Land Surveyor.

(b) Resurveys

(1) Parcels within subdivisions tied into the Monroe County Geodetic Monumentation Network:

Where a resurvey is to be made of a parcel, or a combination of adjoining parcels, within an existing subdivision on which coordinates have been established in accordance with the law and these Rules and Regulations, the surveyor may elect to accept the customary evidence within that subdivision as his control and disregard the requirement to tie into the network directly and inherit the network tie in from the original subdivision.

The Developer must attest to this on the map by following the requirements and notations in accordance with above Section B-1 Two or More Monuments of Record and the following Section B-1 modified or similar notation, and be certified to by a New York State Licensed Land Surveyor:

“This project is less than 2,500 feet (or 5,000 feet) from the nearest Geodetic Survey Monument and is tied into the Monroe County Geodetic Monumentation Network through local control found within the Scenic Heights Subdivision, Section 2 as filed in Liber 254 of Maps, Pages 27. The original subdivision horizontal datum is referenced to the New York State Plane Coordinate System of 1927, West Zone, Transverse Mercator Projection, through control ties to the following monuments:”

NYGS 1026 1936	N=1,090,052.78	E=764,667.01	NAD27
NYGS 1026-1 1940	N=1,090,920.66	E=763,357.52	NAD27

“The project boundary survey and ties to subdivision local control were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet.”

The Combined Scale Factor is: 0.9999851

Map distances shown are (indicate ground or grid) level dimensions.

(2) Subdivisions established prior to the Monroe County Monumentation Law:

Where a resurvey is to be made of a parcel, or any combination of adjoining parcels, within an existing subdivision which was established before the implementation of the law and these regulations, or after their implementation, but was exempt because of distance from then existing monuments or for any other reason, the maximum distance requirements will apply only to the parcel or combination of adjoining parcels, to be surveyed.

(C) Underground Facilities

The Rules and Regulations for this section have not been implemented yet.

From: "Suggested Specifications for Local Horizontal Control Surveys"
ACSM- Control Surveys Division Technical Monograph No. CS-1
By Joseph F. Dracup, March 1969

TRAVERSE

Traverse is a method of surveying in which the lengths and angles between the adjacent points of the network are measured in the field with orientation provided by azimuths determined in previous surveys or by astronomical means.

Checks are obtained by closing the traverse on itself, or as is most preferable, on another previously determined point.

Standards for Traverse:

	First-Order	Second-Order	Third-Order
Azimuth closure: not to exceed*	2 sec √N or 1.0 sec per station	10 sec √N or 3.0 sec per station	30 sec √N or 8.0 sec per station
Position closure: after azimuth adjustment not to exceed*	0.66 ft. √M or 1 in 25,000	1.67 ft. √M or 1 in 10,000	3.34 ft. √M or 1 in 5,000

Distance measurements accurate within	1 in 35,000	1 in 15,000	1 in 7,500
Number of repetitions of measurements between points	2	1	1
Minimum distance to be measured:			
Microwave Inst.	1 mile	0.3 mile	0.2 mile
Electro-optical inst.	0.25 mile	0.1 mile	0.05 mile
Number of Angle Orbs	12	8	4

N is the number of stations for carrying azimuth
M is the distance in miles.

*The expressions for closing errors in traverse surveys are given in two forms. The expression containing the square root is designed for longer lines (those in excess of 20 miles) where higher proportional accuracy is required. The formula which gives the smaller permissible closure should be used.

Traverse is the most commonly used method of horizontal surveying for it is usually meander a line through difficult or wooded terrain without resorting to observing towers. Its use in primary geodetic networks is limited because it lacks the geometric strength of triangulation that results from the redundant observations inherent to that method. In addition, the orientation weaknesses require that checks with known azimuth values or the observation of astronomical azimuths be made at rather frequent intervals. Other drawbacks to its use are: checks are not available until ties are made which makes it difficult to locate errors, and there is always the possibility that compensating blunders can occur. Despite these deficiencies, traverse properly executed is an efficient and accurate surveying method.

Again it must be emphasized there (the previous table) are minimum standards. The average position closure should seldom be less than 1:50,000 for first-order traverse and for second and third-order work 1:20,000 and 1:10:00 respectively.

Azimuth Closure

This is the difference between an azimuth at a point that has been computed from a known azimuth using the field observed angles of the traverse and an azimuth at the point that has been previously determined. The known azimuths may have resulted from previous surveys or may have been determined astronomically.

In some instances if the traverse is to be computed on the state plane coordinate system, the second term correction should be applied to the angles. An excellent reference, in addition to those given previously, for information concerning this correction is found in a paper entitled, “A Practical Use of the Oregon State Plane Coordinate System,” by B.K. Meade, Chief, Triangulation Branch, USC&GS, and available at that Bureau. This paper also explains adjustments procedures not found elsewhere.

Position Closure

In a complicated traverse network, the position closure is not available until an adjustment has distributed the azimuth closures. A good evaluation can be obtained however by distributing the azimuth closing errors on the angles in some logical manner and using the resulting corrected azimuths in a computation with the field measured lengths reduced to horizontal sea-level grid distances. The position closure is the distance between the computed and fixed position for the terminal point as determined in the following formula:

$$\sqrt{(Xc - Xf)^2 + (Yc - Yf)^2}$$

The “c’s” indicated the computed values and the “f’s” the fixed coordinates. The proportional part accuracy is computed by dividing the position closure by the sum of the measured lengths used in the computation.

Minimum Distance to be Measured

These specifications are based on two considerations. First is the distance accuracy requirement; the second is the accuracy evaluations of such instruments that have been made under various atmospheric conditions over a long period of time. In some instances they may not be in accordance with the manufacturers’ advertised accuracy or that experienced by individuals in some parts of the country. But in the overall picture they are considered reasonable.

In order to obtain the required accuracy for the minimum distances specified, however, the instruments must be well calibrated, and in good operating condition, and extreme care must be exercised in making the observations. As a general rule, the minimum distance measured should seldom be less than twice that specified.

NAD27 LINEAR CORRECTIONS TO SEA LEVEL DATUM

ELEV. (ft.)	SEA LEVEL FACTOR	ELEV (ft.)	SEA LEVEL FACTOR
Sea Level	1.0000000	620	.9999704
240	.9999885	640	.9999694
260	.9999876	660	.9999685-
280	.9999866	680	.9999675-
300	.9999857	700	.9999665+
320	.9999847	720	.9999656
340	.9999838	740	.9999646
360	.9999828	760	.9999637
380	.9999818	780	.9999627
400	.9999809	800	.9999618
420	.9999799	820	.9999608
440	.9999790	840	.9999599
460	.9999780	860	.9999589
480	.9999771	880	.9999579
500	.9999761	900	.9999570
520	.9999751	920	.9999560
540	.9999742	940	.9999551
560	.9999732	960	.9999541
580	.9999723	980	.9999532
600	.9999713	1000	.9999522

In formation interpolated from USC&GS Special Publication No. 195, “Manual of Traverse Computation of the Transverse Mercator Grid”

An approximate formula for computing this factor is:

$$\frac{\text{Radius of Earth (ft)}}{\text{Radius of Earth(ft)} + \text{Elevation(ft)}} = \text{Elevation Factor}$$

Radius of Earth (ft) = 20,906,000 ft (approximate)

NAD27 Transverse Mercator Projection for New York Central and West Zones Table for Reduction of Distance to Grid

X' (feet)	Grid Scale expressed as a ratio	X' (feet)	Grid Scale expressed as a ratio
0	0.9999375	175,000	- 0.9999725
5,000	0.9999375	180,000	0.9999745
10,000	0.9999376	185,000	0.9999766
15,000	0.9999378	190,000	0.9999787
20,000	0.9999380	195,000	0.9999810
25,000	0.9999382	200,000	0.9999832
30,000	0.9999385	205,000	0.9999855
35,000	0.9999389	210,000	0.9999879
40,000	0.9999393	215,000	0.9999903
45,000	0.9999398	220,000	0.9999928
50,000	0.9999404	225,000	0.9999953
55,000	0.9999410	230,000	0.9999980
60,000	0.9999416	235,000	1.0000006
65,000	0.9999423	240,000	1.0000033
70,000	0.9999431	245,000	1.0000061
75,000	0.9999439	250,000	1.0000089
80,000	0.9999448	255,000	1.0000118
85,000	0.9999458	260,000	1.0000147
90,000	0.9999468	265,000	1.0000177
95,000	0.9999478	270,000	1.0000208
100,000	0.9999489	275,000	1.0000239
105,000	0.9999501	280,000	1.0000271
110,000	0.9999513	285,000	1.0000303
115,000	0.9999526	290,000	1.0000336
120,000	0.9999539	295,000	1.0000369
125,000	0.9999554	300,000	1.0000403
130,000	0.9999568	305,000	1.0000438
135,000	0.9999583	310,000	1.0000473
140,000	0.9999599	315,000	1.0000509
145,000	0.9999615	320,000	1.0000545
150,000	0.9999632	325,000	1.0000582
155,000	0.9999650	330,000	1.0000619
160,000	0.9999668	335,000	1.0000657
165,000	0.9999686	340,000	1.0000696
170,000	0.9999705	345,000	1.0000735

From: Department of Commerce, Coast & Geodetic Survey, Plane Coordinate Projection Tables New York Special Publication No. 323

To reduce a line to grid distance:

Absolute Value (Mean of the project Eastings – 500,000) = X'

Interpolate in table as necessary

Grid Scale Factor * Sea Level Distance = Grid Distance

Acceptable Formats and Notes for Showing Geodetic Control
Used In Tying a Project Into the Monroe County
Geodetic Monumentation Network

GENERAL SURVEY NOTES

The Developer's and Contractor's attention is directed to Local Law No. 6 of 2019 regarding liability incurred through disturbance or destruction of Geodetic Survey Monuments.

The Developer and Contractor must locate, mark, barricade, safeguard and preserve all survey control monuments and right of way monuments in the areas of construction. For descriptive and survey data for geodetic control monuments, go to the County of Monroe Surveyors Office website and access the GIS based internet web viewer, or contact the Monroe County Surveyors Office.

This project is less than 2,500 feet (or 5,000 feet if more than 5 lots) from the nearest Geodetic Survey Monument and this project is tied into the Monroe County Geodetic Monumentation Network.

The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1927, West Zone, Transverse Mercator Projection, NAD 27 through control ties to the following geodetic monuments:

MCGS 1004 1969	N=1,096,952.20	E=783,139.21	NAD27
MCGS 1061 1969	N=1,093,492.54	E=783,293.14	NAD27
USC&GS LONE 1969	N=1,093,421.38	E=789,120.73	NAD27

OR

The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1983, West Zone, Transverse Mercator Projection, NAD 83 (2011) through control ties to the following geodetic monuments:

MCGS 4757R 2020	N=1,134,698.99	E=1,458,280.87	NAD83(2011)
MCGS 4781R 2020	N=1,134,832.15	E=1,463,625.87	NAD83(2011)
MCGS 9280R 2020	N=1,134,717.79	E=1,459,421.10	NAD83(2011)

OR

The horizontal datum shown hereon is referenced to the New York State Plane Coordinate System of 1983, West Zone, Transverse Mercator Projection, NAD 83 (2011) utilizing Global Positioning System (GPS) (or) Global Navigation Satellite System (GNSS) observations from the NYSDOT Reference Network CORS Station (NYPF 0032) with control ties to the following geodetic monuments:

MCGS 2706 1991	N=1,136,650.43	E=764,573.11	PUBLISHED NAD27
	N=1,136,689.74	E=1,412,931.12	MEASURED NAD83 (2011)
MCGS 2708 1991	N=1,138,434.84	E=763,718.40	PUBLISHED NAD27
	N=1,138,474.08	E=1,412,076.60	MEASURED NAD83 (2011)

For traditional Terrestrial Positioning Surveys (TPS):

The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet.

For Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques localized to passive geodetic monuments:

The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet.

For Global Positioning System (GPS) or Global Navigation Satellite System (GNSS) survey techniques establishing NAD83:

The project boundary survey and ties to Monroe County geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of 1 part in 20,000 (1:20,000) or better proportional accuracy (or) 50 parts per million (50 ppm) or better proportional accuracy (or) a Local Positional Accuracy at 95% confidence level not exceeding 0.025 feet and a Network Positional Accuracy at 95% confidence level not exceeding 0.05 feet.

Elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD29) through control ties to the following Bench Marks:

NYGS 1215 Elevation 583.508 Ft.
NYGS 1216 Elevation 619.769 Ft.

OR

Elevations are referenced to the North American Vertical Datum of 1988 (NAVD88) through control ties to the following Bench Marks:

NYGS 1215 Orthometric Height 583.508 Ft.
NYGS 1216 Orthometric Height 619.769 Ft.

The Combined Scale Factor is: 1.00001709

Map distances shown are grid level dimensions.

By_____ Date_____
Licensed Land Surveyor Name
N.Y.S.P.L.S. No _____

Monroe County Surveyors Office
Subdivision Map Requirements
For Map Filing in the Monroe County Clerk's Office

Subdivision map review and approval is conducted by the County Surveyor as an administration of the Monroe County Monumentation Law, Local Law No. 6 of 2019. The requirements are provided as a guide for conformance with the Monumentation Law and for conformance with County of Monroe Real Property Services subdivision map filing requirements.

Property boundary surveys and property subdivision mapping can present unique circumstances, as a result map review concerns and comments are not limited to or bound by the requirements listed.

An electronic copy of subdivision or resubdivision maps can be submitted to the County Surveyors Office for preliminary review via email to gregorybly@monroecounty.gov. Alternately, the Mylar original can be directly submitted. Duration of preliminary review and final approval is one year.

Subdivision and Resubdivision Maps must show the following items as a minimum.

1. Required map notations for geodetic monumentation network tie in requirement. See Land Surveyors Guide referenced at end of requirements for examples and acceptable formats.

    A. This project is more than 2,500 feet (5,000 feet if more than 5 lots) from the nearest Geodetic Survey Monument and therefore is not tied into the Monroe County Geodetic Monumentation Network.

        1. Project boundary perimeter measurements were made using procedures necessary to achieve a horizontal accuracy of one of the following:

            a. Where traditional Terrestrial Positioning Surveys (TPS) survey techniques are employed - 1 part in 20,000 (1:20,000) or better proportional accuracy or 50 parts per million (50 ppm) or better proportional accuracy or a Local Positional Accuracy at two sigma, 95% confidence level not exceeding 0.025 feet.

            b. Where Global Positional System Surveys (GPS) or Global Navigation Satellite System (GNSS) survey techniques are employed - 1 part in 20,000 (1:20,000) or better proportional accuracy or 50 parts per million (50 ppm) or better proportional accuracy or a Local Positional Accuracy at two sigma, 95% confidence level not exceeding 0.025 feet **and** the achieved Network Positional Accuracy at two sigma, 95% confidence level.

            c. Vertical datum and source (if applicable).

    B. This project is less than 2,500 feet (5,000 feet if more than 5 lots) from the nearest Geodetic Survey Monument and this project is tied to the Monroe County Geodetic Monumentation Network. Monument(s) closest to the site must be utilized.

        1. Full monument name(s), coordinates with reference datum, published and/or adjustment date and elevation (if applicable) with reference datum as shown on monument Data Tie Sheets available at the County GIS based web viewer or at the Monroe County Surveyors Office.

        2. If tie in geodetic monuments are referenced to NAD 27 datum and the survey is referenced to NAD 83 datum as determined by the project survey, show tie in geodetic monument NAD 83 coordinates as measured and realization of NAD 83 and the NAD 27 coordinates as published per the monument Data Tie Sheets. Indicate CORS monument the coordinates were derived from.

        3. If there is one or more non-coordinated geodetic monument(s) within the tie in distance requirement, the monument(s) must be tied into and related to the subdivision boundary and shown in a schematic diagram on the map. If only one monument is available, a back azimuth to a

visible structural object or alternately the best available stable survey point with the most likely permanence must be used and shown in a schematic diagram on the map.

4. A grid factor and elevation factor; or a combined factor.

5. Indicate whether “Grid” or “Ground” distances are shown.

6. The project boundary perimeter measurements and if tied into the Monroe County Monumentation Network, ties to geodetic monuments were made using procedures necessary to achieve a horizontal accuracy of one of the following:

   a. Where traditional Terrestrial Positioning Surveys (TPS) survey techniques are employed - 1 part in 20,000 (1:20,000) or better proportional accuracy or 50 parts per million (50 ppm) or better proportional accuracy or a Local Positional Accuracy at two sigma, 95% confidence level not exceeding 0.025 feet.

   b. Where Global Positional System Surveys (GPS) or Global Navigation Satellite System (GNSS) survey techniques are employed and localized to passive geodetic monuments - 1 part in 20,000 (1:20,000) or better proportional accuracy or 50 parts per million (50 ppm) or better proportional accuracy or a Local Positional Accuracy at two sigma, 95% confidence level not exceeding 0.025 feet.

   c. Where Global Positional System Surveys (GPS) or Global Navigation Satellite System (GNSS) survey techniques are employed to establish NAD 83 datum – 1 part in 20,000 (1:20,000) or better proportional accuracy or 50 parts per million (50 ppm) or better proportional accuracy or a Local Positional Accuracy at two sigma, 95% confidence level not exceeding 0.025 feet **and** the achieved Network Positional Accuracy at two sigma, 95% confidence level.

2. A reference orientation and statement of supporting data for that orientation must be shown for azimuths and bearings. Examples of acceptable orientations: Grid with reference datum, assumed, magnetic, deed, reference or true.

3. On coordinated maps a minimum of three pairs of coordinates must be shown on the subdivided parcel(s) area.

4. If elevations are shown, a project bench mark along with its elevation and the reference datum used in establishing the project bench mark must be shown.

5. If a monument exists within the scope of this map, the monument must be shown on the map with a statement concerning responsibility for its preservation. See Monroe County Surveyors Office web page for language. A security deposit, monument monitoring and/or other arrangements may be necessary where, in the Monroe County Surveyor’s judgment, an existing monument may be in danger of destruction.

6. The R.O.W. width for existing and proposed roads must be clearly shown. R.O.W. width for existing historical roads should be confirmed by examining the County “Roads and Widths of Right-of Ways Reference Booklet” created from the Monroe County Road R.O.W. Records available at the County Surveyors Office webpage or by confirming with the Monroe County Surveyors Office. Monroe County Road R.O.W. Records consist of Town Clerk’s road opening records from the original highway surveys, most of which were from the 1800’s and are not fee R.O.W. but are easement R.O.W for the road. County Highway R.O.W. records available in the County Records Room provide record information of County R.O.W. acquisitions for expansions of County Road R.O.W.. Tax maps are for assessment purposes and should **not** be relied on for R.O.W. width, configuration, or acquisitions. Unless there was a County

R.O.W. acquisition and in accordance with the Monroe County Road R.O.W. Records, there are **no curved** R.O.W. lines on historical County Roads.

Highway Boundary Plans are available at the County Surveyors Office webpage for some County Roads. The Highway Boundary Plans are certified highway boundary surveys for County Road R.O.W.'s tied to NAD 83 (2011). The Highway Boundary Plan information provided at the County Surveyors Office webpage consists of Cad and coordinate files.

If a County Road R.O.W. width different from the Monroe County Road R.O.W. Records or a road R.O.W. boundary location different from a Highway Boundary Plan has been determined by survey, indicate survey and/or record basis for R.O.W. width and R.O.W. boundary location, show the County record R.O.W. width and Highway Boundary Plan road R.O.W. boundary location, provide and label the R.O.W. line per County Road R.O.W. Records and/or Highway Boundary Plan. In addition, the County record R.O.W. line must be shown and represented on the map with equal emphasis to the differing R.O.W. line determined by the survey and provide property line dimensions and Lot areas to and along both R.O.W. lines.

If a non-County Road R.O.W. width different from the Monroe County Road R.O.W. Records has been determined by survey, indicate survey and/or record basis for R.O.W. width, indicate the County record R.O.W. width "Per County Road R.O.W. Records", show and label the R.O.W. line per "County Road R.O.W. Records".

"R.O.W. Width Varies" and irregular or uncentered/offset R.O.W. corridor is not acceptable without additional information providing the survey and record basis for the location of the R.O.W. line and a relationship of the road R.O.W. line with the historical road R.O.W. centerline, which typically is the historical parcel title line. If the historical road R.O.W. surveyed centerline is untraceable, provide a relationship with the former centerline of the paved roadway from record mapping or the physical location of the historical paved centerline if discernable.

7. The State Route or County Road number must be shown on State or County Roads.

8. A tie distance along road R.O.W. or R.O.W. centerline to the nearest public R.O.W. intersection, angle point or point of curvature. If tie distance is to angle point or P.C., provide approximate overall tie to nearest public R.O.W. intersection.

9. Distances on all property and proposed easement lines. If there are differing measured and record property line distances, both must be shown and identified. If title for property is to centerline, show distances to and along centerline and R.O.W.. Where a parcel has a water boundary, the riparian or littoral limit of title must be defined by distances and shown.

10. Angles, Bearings or Azimuths on all property and proposed easement lines. Note: On coordinated maps, only azimuths or bearings referenced to the coordinate system will be accepted. If there are differing measured and record property line bearings, both must be shown and identified.

11. The minimum curve information required is curve length and radius. Where the delta angle is not directly apparent from other information on the map, or where the curve is not tangent, or the PC or PT of the curve is not shown, additional curve information must be shown so a closed mathematical figure can be independently verified.

12. Area of parcel(s) must be made from a computable closed figure as shown on the map. Where a parcel has a water boundary, the area between the closing or tie line and the riparian or littoral limit of title may be scaled and then added to the computed area. Areas must be shown in square feet and/or acres. Acres must be shown to a minimum of 3 decimal places unless on a water boundary. If title to the property is to centerline, lot area(s) must be shown to centerline and to R.O.W..

13. When a subdivision or resubdivision map results in a Remaining Lands area from the existing parcel, at a minimum the remaining land must show approximate dimensions and area, be labeled “Remaining Lands” and will not be considered part of the subdivision. If the remaining area is included as part of the certified survey area with definition by accurate survey bearings or angles, distances and area, the remaining lands become part of the subdivision and can be assigned a lot number or labeled “Remaining Lands”. If a Lot number is assigned any further division of the Remaining Lands will be a resubdivision of the created subdivision parcel and will need to be shown in its entirety with complete geometry and area for the new remaining area.

14. A minimum of three property line, road R.O.W. centerline or R.O.W. line survey points and/or monuments found or set must be shown. Survey points and/or monuments can only be shown “To Be Set” on proposed internal subdivision section maps and land development sites where the monuments cannot be set until the subdivision section has been built or site development has been completed. Survey points and monuments required to be shown are intended for survey retracement purposes, therefore an adequate number and dispersion of survey points need to be shown to enable full survey retracement. If found survey points shown are outside the area of the subject parcel(s), their relationship to the subject parcel(s) must be shown to enable survey retracement. If survey points shown are determined to be out of position and corrected, corrections must be shown to enable and provide a means for survey retracement. Survey points outside of the mapping area can be referred to in note form with a description, spatial relationship and location.

15. Show map references and legal sources of deeds.

16. If there is a property line conflict resulting in a gore or overlap, identify the conflicting record sources for conflicting property lines and dimension amount of gore or overlap at each end of and at deflections within the conflicting area.

17. If the map is a townhouse project, lot and/or block locations must conform to the recommendations as stated in the letter to the Monroe County Surveyors Office from the Genesee Valley Land Surveyors Association dated May 4, 1987 which address filing requirements for Townhouses and Condominiums (See: *The Monroe County Monumentation Law: A Guide for Surveyors and Engineers* for a copy of this letter).

18. Surveyors signed Certification for the property boundaries and tie into the Monroe County Monumentation Network are certified from an instrument survey or field survey and date of survey.

19. Surveyors original signature (digital/scanned signatures are not accepted) and license number with surveyor’s certification (must be clear and legible on prints made from original and for microfilming and scanning).

20. Surveyor’s original digital or live stamp (must be clear and legible on prints made from original and for microfilming and scanning).

21. Map size (17” x 22”; 22” x 34”; or 34” x 44”) on Mylar or Linen.

22. The subdivision map must clearly and legibly represent the information presented, with adequate annotation/labeling of lines and symbols and/or with map legend along with adequate font sizes to allow for general legibility on the map and after microfilming and scanning.

23. Proposed subdivision and resubdivision maps cannot create lots that are a proposed combination of property or “z-hooked” on both sides of a public road or private drive. If property is already z-hooked across a road the property can remain z-hooked or z-hook can be eliminated, subject to Real Property review.

24. When combining parcels with different owners, the deed creating common ownership of the parcels proposed to be combined must be recorded and recordation information must be noted directly on the conveyed parcel on the map.

25. Identify / label the R.O.W. line and R.O.W. centerline.

26. Show owners names and tax account numbers directly within map parcel area for subject subdivision existing parcels and adjoining parcels.

27. In map title block state subdivision name and below Subdivision or Resubdivision Map name state: Town Lot, Township and Range, Mill Seat Tract of the Phelps & Gorham Purchase / Triangle Tract, City / Village / Town, County, and State. If resubdivision map include original subdivision name and map filing information. When in question regarding title block format and/or resubdivision lot numbering scheme, contact Real Property Services at 585-753-1150 for guidance.

28. North Arrow.

29. State the proportional scale (example: 1" = 50') and show a bar scale.

30. Location Sketch (including name of town and north arrow).

31. Final map must be approved with original approval signatures by City, Town, or Village Planning Board and Monroe County Health Dept. before the map can be signed by the Monroe County Surveyors Office. If the subdivision or resubdivision adjoins a County Road, the map must be approved by the Monroe County Department of Transportation. In addition, the County Treasurer's approval is required for submission of the subdivision map with Real Property Services for filing with the County Clerk's Office.

32. The Monroe County Surveyors Office subdivision map approval stamp is available in an AutoCad block at the County website on the Monroe County Surveyors Office web page and should be included on the map for those generating Cad subdivision or resubdivision maps. The County Surveyor's Office and the Monroe County Department of Transportation approval signature will be provided on the mylar original only and not on paper copies or prints.

Additional Requirements for Mapping in the City of Rochester:
Map must be approved with original approval signature by the City of Rochester Maps and Surveys Office and City Planning Office before the map can be signed by the Monroe County Surveyors Office.

Resources available at the County Surveyors Office webpage:

Monroe County Monumentation Law Local Law No. 6 of 2019

The Monroe County Monumentation Law: A Guide for Land Surveyors

Monroe County Surveyors Office Subdivision Map Requirements For Map Filing in the Monroe County Clerk's Office

Roads and Widths of Right-of Ways Reference Booklet

County Road Highway Boundary Plans

Links for the Monroe County Geodetic Monument and NGS Geodetic Monument Web Viewers for access to geodetic monument Data Tie Sheets and monument information

Geodetic monument preservation standard note language

Cad block subdivision approval stamp for Monroe County Surveyors Office / Monroe County Department of Transportation

Monroe County Real Property Services Procedures and Requirements for Filing Subdivision and Resubdivision Maps

Questions? Please contact:

Greg Bly, County Surveyor

Monroe County Surveyors Office
39 West Main Street, Room 304
Rochester, NY 14614
585-753-1156
fax: 585-753-1192 gregorybly@monroecounty.gov

Last Revised: 02/15/2022 GDB

Genesee Valley
Land Surveyors Association
170 MT. READ BLVD. • ROCHESTER, N.Y. 14611 • PHONE (716) 328-2310
Reply to

May 4, 1987

Monroe County Surveyors Office
Department of Engineering
350 East Henrietta Road
Rochester, New York, 14620

Attention: Mr. Robert R. Prescott, L.S.

RE: FILING REQUIREMENTS FOR TOWNHOUSES AND CONDOMINIUMS

Dear Bob:

We would like to make the following comments and recommendations pertaining to townhouse and condominium maps and applicable requirements for filing of these maps.

In a condominium, an individual purchases the 'right' to occupy a specified, or exclusive, space a long with a proportional interest in the remaining common areas. The key element here is the fact that one purchases a 'right' to occupy a specified space. There isn't any transfer of real property, nor is there any subdivision of real property. While some states have filing requirements for condominium maps, to our knowledge, New York State does not. The only regulations are relative to the submittals required by the State Attorney General's office for the homeowners association.

A townhouse project differs from a condo project in one very significant manner. In a townhouse development, an individual receives fee title to a subdivision lot on which the townhouse is situated. The fact that title to real property is transferred, thereby creating a realty subdivision, clearly places this type of project under the Monroe County Monumentation Law and map review checklist.

As there are a couple of different methods to show proposed townhouse lots on a subdivision map, we would recommend that the existing map review checklist be utilized with a modification which addresses townhouse mapping. This modification would basically require that at least two exterior corners of each block, building or group of contiguous lots be 'tied down' with either state plane coordinates, right angle ties to exterior boundaries or phases lines, station and offset to centerline of roads or private drives.

Along with the above, each lot should be clearly dimensioned either along the property lines, in a tabular method clearly referenced to the site plan, or by showing a standard lot or building 'footprint'.

In summary, townhouse projects are a realty subdivision and subject to the same rules and regulations as a conventional single family subdivision. Condominiums are not a realty subdivision and there no requirements for filing at the County Clerk's office. However, if there is a request to file a condo site plan with the County Clerk, I would recommend that the "Minimum Standards of Residential Surveys", which the Bar Association and Genesee Valley have jointly adopted, be used as a review criteria.

If you have any questions or wish to discuss this further, please contact me.

Very truly yours,

GENESEE VALLEY LAND SURVEYORS ASSOCIATION

By: James L. Mueller

James L. Mueller, L.S.
Vice President

JLM:bsw

cc: A. English, Pres. GVLSA
F. Russell
W. Gillette