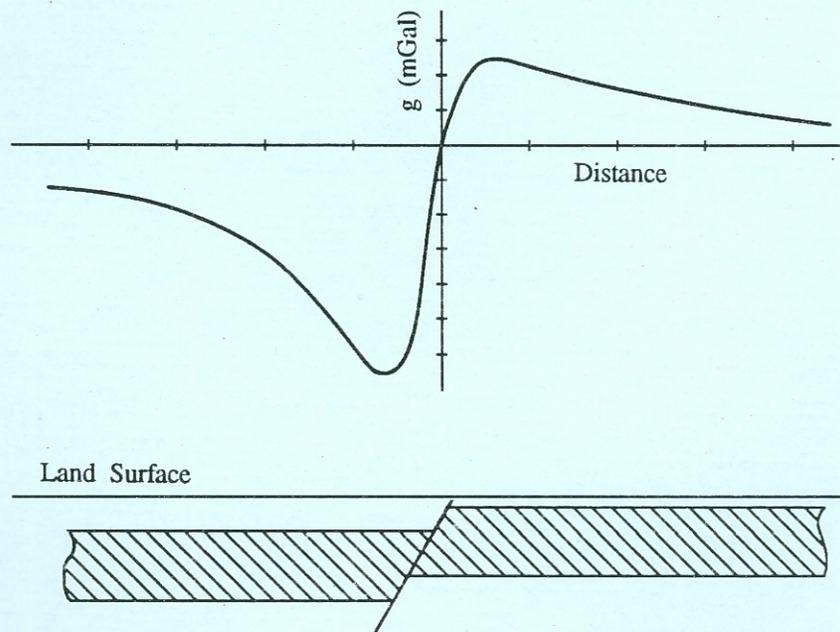




New Jersey Geological Survey
Open-File Report OF 90-2

Gravity Base Station Network in Northern New Jersey



STATE OF NEW JERSEY

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Department of Environmental Protection

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John S. Keith, *Assistant Commissioner*

Geological Survey

Haig F. Kasabach, *State Geologist*

Cover illustration: Theoretical gravity anomaly in the vicinity of a fault cutting a relatively dense, tabular body of rock (ruled). Modified from Geldart and others, 1966.

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**Gravity Base Station Network in
Northern New Jersey**

by
Suhas L. Ghatge and Donald L. Jagel

New Jersey Department of Environmental Protection
Division of Water Resources
Geological Survey
CN-029
Trenton, NJ 08625

1990

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GRAVITY BASE STATION NETWORK IN NORTHERN NEW JERSEY

by
Suhas L. Ghatge and Donald L. J agel

INTRODUCTION

This project was undertaken to help gravity investigators in the State of New Jersey to normalize gravity values to a common datum. The gravity base station network will be an accurate reference system for this purpose. An attempt is being made to establish at least two base stations per county within the state. This report provides the principal facts of each gravity base station and also a description of each base station in northern New Jersey.

GRAVITY FIELD METHODS

The gravity meters used in this study were a Lacoste & Romberg Microgal gravimeter (Model # D-25) capable of reading to the nearest 0.001 milligal (mGal) and a Lacoste & Romberg gravimeter (Model # G-77) reading to the nearest 0.01 mGal. Base stations NJ-32 and NJ-33 were occupied using the #G-77 gravimeter.

Gravity readings were taken at 33 locations (fig. 1), mainly on benchmarks. Some base stations were located near street intersections or adjacent to permanent landmarks. The accuracy of the microcrometer readings was maintained by taking successive observations until duplication was obtained to within 0.02 mGals. Counter readings were converted to milligal values according to the gravity meter specifications. Elevations of stations not on benchmarks were obtained by an altimeter capable of being read to the nearest foot or interpolated from 7.5-minute USGS quadrangle maps with a contour interval of 20 feet. Latitudes were obtained from 7.5-minute U. S. Geological Survey quadrangle maps. The margin of error in latitude was ± 0.02 minutes.

The primary base station used in the project was that established by Bonini and Woollard (1957) in Guyot Hall, Princeton University. The observed gravity at the Princeton base station is 980177.6 mGal (Boninni and Woollard, 1957). This value was based on the Primary Pendulum Base (910.119 gal), U.S. Commerce Department Building Base, Washington, D.C.

A looping technique was used for gravity base station measurements. Each loop had a duration of 2 hours or less. The ladder sequence (stations A,B,C,B,A), where all stations occupied were reoccupied on the return leg, was used in each loop. For example, the first loop consisted of readings taken in the following order: Princeton - NJ1 - NJ2 . NJ1 . Princeton. The loops terminated at the starting base station.



Figure 1. Locations of gravity base stations in New Jersey

Table 1. Principle facts of gravity stations.

Station	Latitude		Longitude		Elevation	Observed Gravity
	Degrees	Minutes	Degrees	Minutes	Feet	mGal
NJ-1	40	14.916	74	45.374	67.43	980189.64
NJ-2	40	18.018	74	51.678	136.08	980165.29
NJ-3	40	19.968	74	47.565	180.23	980164.55
NJ-4	40	26.528	74	51.352	262.00	980163.76
NJ-5	40	30.617	74	51.565	181.82	980173.75
NJ-6	40	40.520	74	53.563	534.31	980174.31
NJ-7	40	22.250	74	56.822	78.70	980164.19
NJ-8	40	26.783	75	2.643	543.00	980137.49
NJ-9	40	40.757	74	39.031	197.73	980195.09
NJ-10	40	47.155	74	41.721	854.92	980168.68
NJ-11	40	55.689	74	41.147	682.39	980183.43
NJ-12	41	3.467	74	45.283	678.88	980193.18
NJ-13	41	8.8	74	45.133	575.99	980205.39
NJ-14	40	54.380	74	24.289	425.78	980180.16
NJ-15	40	47.759	74	38.873	354.55	980198.48
NJ-16	40	54.380	74	24.289	425.78	980210.86
NJ-17	41	3.527	74	17.195	262.82	980231.56
NJ-18	41	9.106	74	20.840	642.60	980204.51
NJ-19	40	43.217	74	17.817	139.98	980214.67
NJ-20	40	39.800	74	27.500	234.00	980198.61
NJ-21	41	16.600	74	39.217	808.39	980203.38
NJ-22	41	12.500	74	36.400	417.20	980223.04
NJ-23	40	57.650	74	14.667	335.00	980217.43
NJ-24	40	45.550	74	58.650	471.50	980176.49
NJ-25	40	49.517	75	4.750	280.80	980193.13
NJ-26	40	41.667	75	6.767	315.00	980174.34
NJ-27	40	54.600	74	58.650	463.00	980192.77
NJ-28	41	4.350	73	57.783	659.00	980187.70
NJ-29	41	9.317	74	53.050	460.00	980209.11
NJ-30	40	34.033	75	5.850	139.00	980173.38
NJ-31	40	52.5	74	48.550	643.00	980182.24
NJ-32	40	24.273	74	25.516	124.26	980208.38
NJ-33	40	31.805	74	19.303	111.70	980220.64
PRINCETON	40	20.750	74	39.007		980177.60
RUTGERS	40	29.88	74	26.82		980209.81
RIDER	40	20.75	74	44.283		980181.80

The original loop was from the Princeton base station. Subsequent loops originated from base stations previously established as a part of this project. Each station was occupied at least twice.

The gravity meter was read by the same observer over an entire loop.

GRAVITY DATA REDUCTION

Gravity measurements were reduced using formulas in Dobrin (1976) and the 1930 International Gravity Formula. The corrections for tidal effects and instrumental drift were performed using a gravity reduction computer program on an IBM-PC or a compatible.

The gravity readings at each station were converted to observed gravity values by correcting for tidal and instrumental drift from base-station readings repeated at intervals of two hours or less.

RESULTS

The principal facts of the gravity base stations including station name, latitude, longitude, elevation (feet), and observed gravity (mGal) are provided in table 1.

Appendix I contains a description and location map (not to scale) of each base station, the county, station name, the township, the USGS

topographical quadrangle, latitude, longitude, elevation, and the average observed gravity. Location maps and descriptions of some of the base stations are drawn based on New Jersey Geodetic Control Survey monument descriptions, available through the New Jersey Department of Transportation.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the assistance of Stewart Sandberg, John Groenewold, David Pasicznyk, Thomas Bambrick, Jeffrey

Kearns and David Hall of the Bureau of Ground-Water Resources Evaluation in collection of the gravity data.

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- Dobrin, M. B., 1976, Introduction to Geophysical Prospecting (3rd ed.): New York, McGraw-Hill, 630 p.

- Yersak, R. E., 1977, Gravity study of Staten Island and vicinity: New Brunswick, New Jersey, Rutgers Univ., unpublished Masters thesis, 45 p.

NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MERCER

STATION: NJ-1

MUNICIPALITY: EWING TWP.

BENCHMARK: RV2193

USGS QUADRANGLE: TRENTON WEST

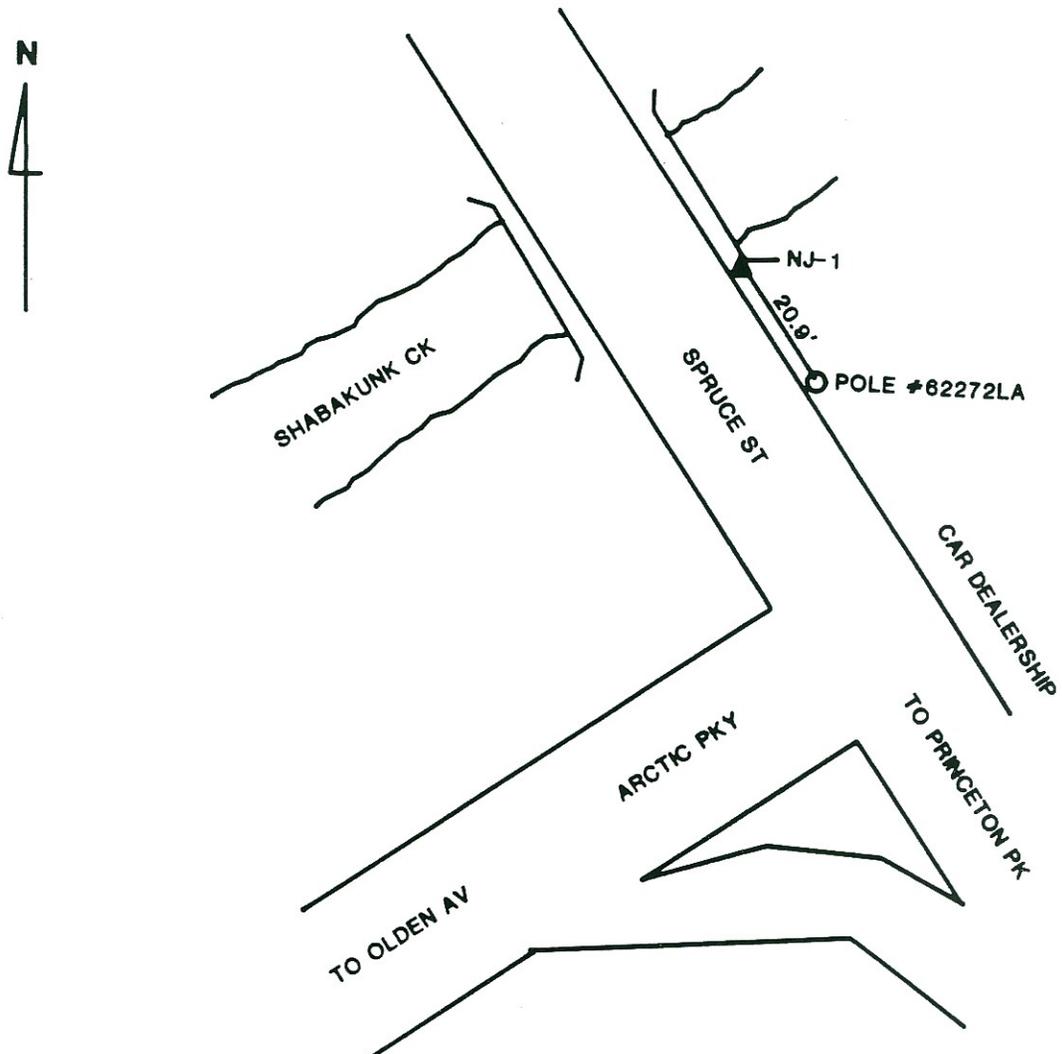
LATITUDE DEGREES: 40 MINUTES: 14.916

LONGITUDE DEGREES: 74 MINUTES: 45.374

ELEVATION: 67.430 FEET 20.553 METERS GRAVITY: 980189.640

DESCRIPTION: ON THE NE SIDE OF SPRUCE ST., JUST NW OF ARCTIC PARKWAY ON THE BASE OF THE BRIDGE BALUSTRADE AT THE SE CORNER OF THE NAME PLATE OF THE BRIDGE (#5-4411) CARRYING SPRUCE ST. OVER LITTLE SHABAKUNK CREEK. 20.9 FT. NW OF POLE #62272LA. A MONEL METAL RIVET

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MERCER

STATION: NJ-2

MUNICIPALITY: HOPEWELL TWP.

BENCHMARK: MON. 5162

USGS QUADRANGLE: PENNINGTON

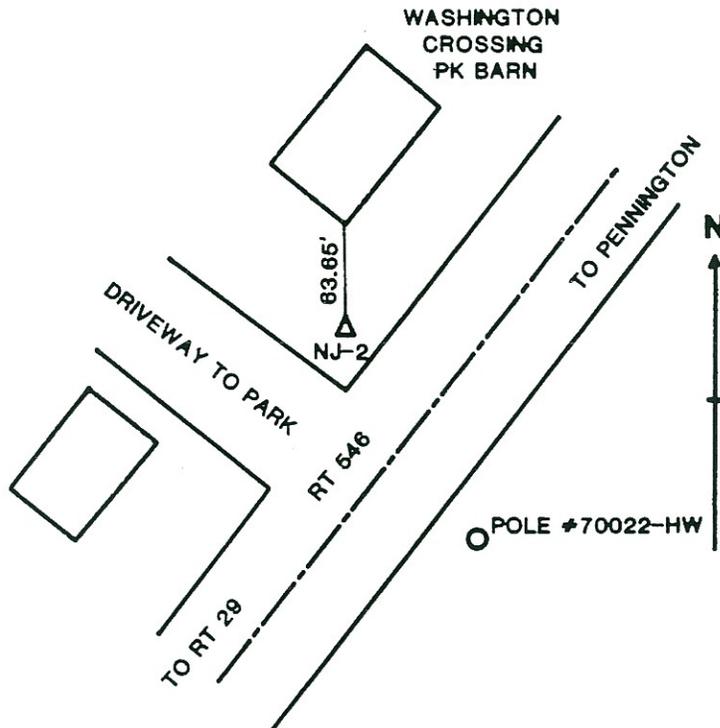
LATITUDE DEGREES: 40 MINUTES: 18.018

LONGITUDE DEGREES: 74 MINUTES: 51.678

ELEVATION: 136.076 FEET 41.476 METERS GRAVITY: 980165.290

DESCRIPTION: A STANDARD NJGCS DISC, ON THE NORTH SIDE OF RT. 546 ABOUT 0.4 MILES EAST OF WASHINGTON CROSSING, AND IN THE PROPERTY OF WASHINGTON CROSSING STATE PARK. THE MONUMENT IS 63.65 FT. SW OF A PARK BARN AND 48.4 FT. NE OF POLE 70022-HW.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MERCER

STATION: NJ-3

MUNICIPALITY: PENNINGTON BORO

BENCHMARK: MON-133

USGS QUADRANGLE: PENNINGTON

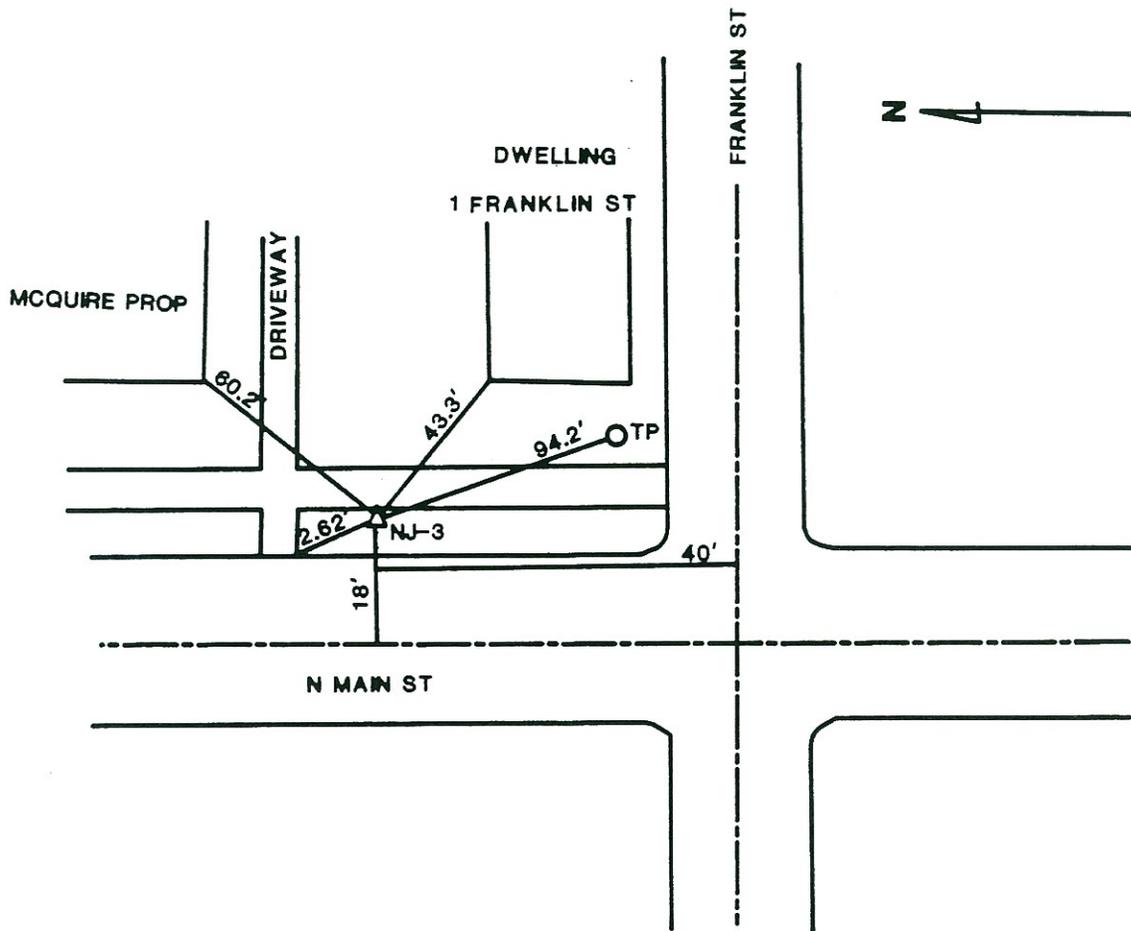
LATITUDE DEGREES: 40 MINUTES: 19.968

LONGITUDE DEGREES: 74 MINUTES: 47.565

ELEVATION: 180.226 FEET 54.933 METERS GRAVITY: 980164.550

DESCRIPTION: LOCATED AT THE INTERSECTION OF N. MAIN ST. AND FRANKLIN ST. IN PENNINGTON. 110 FEET N. OF FRANKLIN ST. ON THE EAST SIDE OF N. MAIN ST. BETWEEN THE ROAD AND THE SIDEWALK. THE MONUMENT IS A STANDARD U.S.C.&G.S. DISK 3 INCHES BELOW THE GROUND SURFACE

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-4

MUNICIPALITY: EAST AMWELL TWP.

BENCHMARK: 1643

USGS QUADRANGLE: HOPEWELL

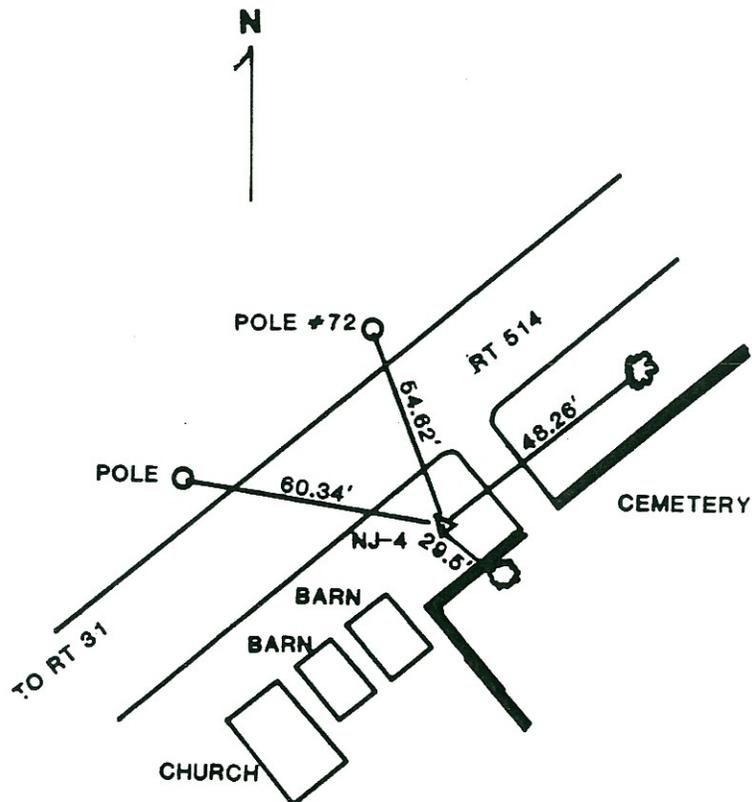
LATITUDE DEGREES: 40 MINUTES: 26.528

LONGITUDE DEGREES: 74 MINUTES: 51.352

ELEVATION: 262.000 FEET 79.800 METERS GRAVITY: 980163.760

DESCRIPTION: A STANDARD DISK SET IN CONCRETE, 0.2 FEET ABOVE CROWN OF ROAD, ON THE SOUTH SIDE OF BLACKTOP ROAD LEADING TO LARISON'S CORNER-CLOVER HILL ROAD AND RTE. 202 & 31 AND ABOUT 5.5 MILES SOUTH OF FLEMINGTON. THE MONUMENT IS 17.5 FEET SW OF CENTER LINE OF ROAD, 54.62 FT. SOUTH OF W.U.T. POLE #72, 48.26 FT. WEST OF MAPLE TREE ON THE SOUTH SIDE, 29.5 FT. NW OF PINE TREE IN CEMETERY.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-5

MUNICIPALITY: FLEMINGTON BORO

BENCHMARK: MON. 1671

USGS QUADRANGLE: FLEMINGTON

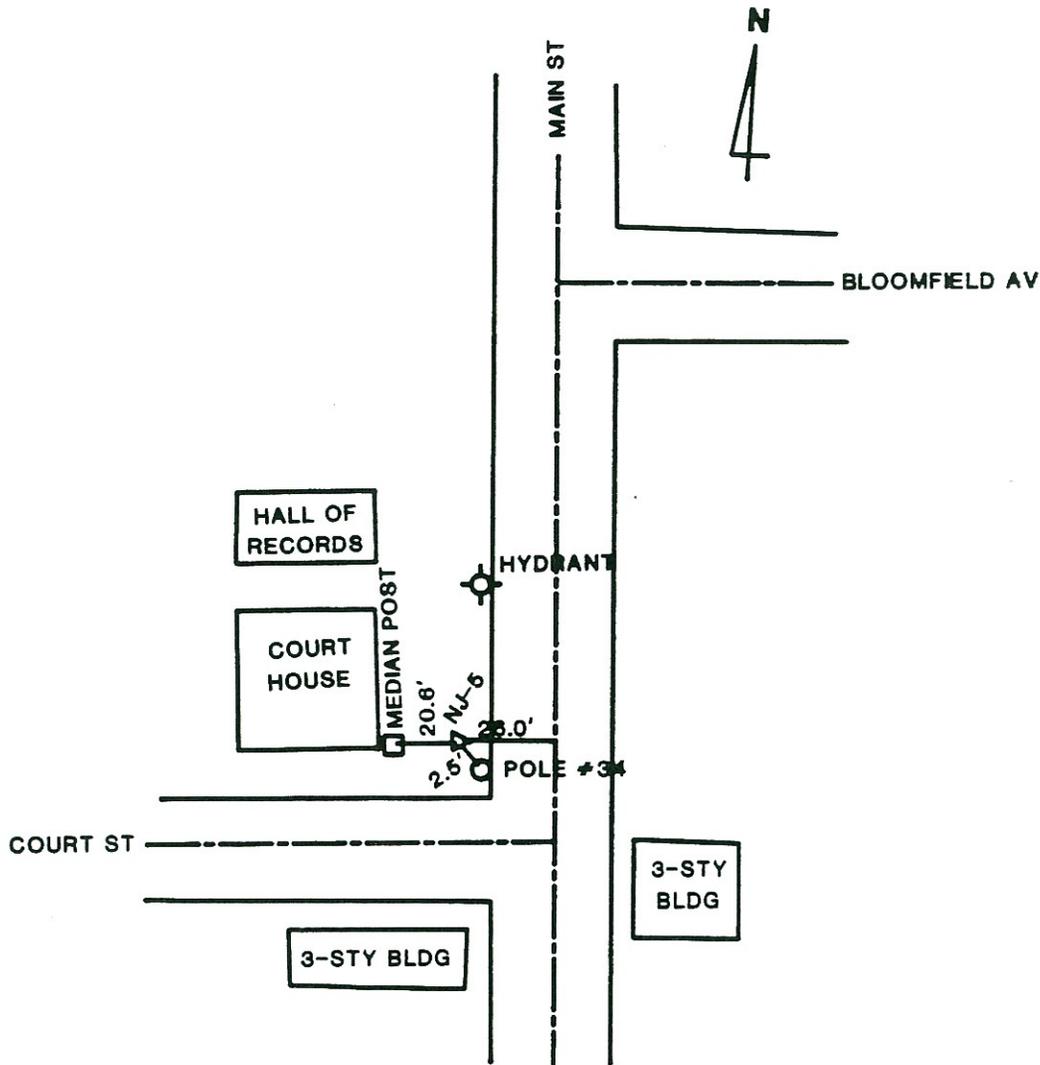
LATITUDE DEGREES: 40 MINUTES: 30.617

LONGITUDE DEGREES: 74 MINUTES: 51.565

ELEVATION: 181.824 FEET 55.419 METERS GRAVITY: 980173.750

DESCRIPTION: BENCHMARK BENEATH CIRCULAR IRON SUPPORT AND LID IN FRONT OF THE HUNTERDON COUNTY COURT HOUSE AT THE CORNER OF MAIN ST. AND COURT ST. READING TAKEN ON TOP OF THE IRON LID.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-6

MUNICIPALITY: HIGH BRIDGE BORO

BENCHMARK: MON 7672

USGS QUADRANGLE: HIGH BRIDGE

LATITUDE DEGREES: 40 MINUTES: 40.520

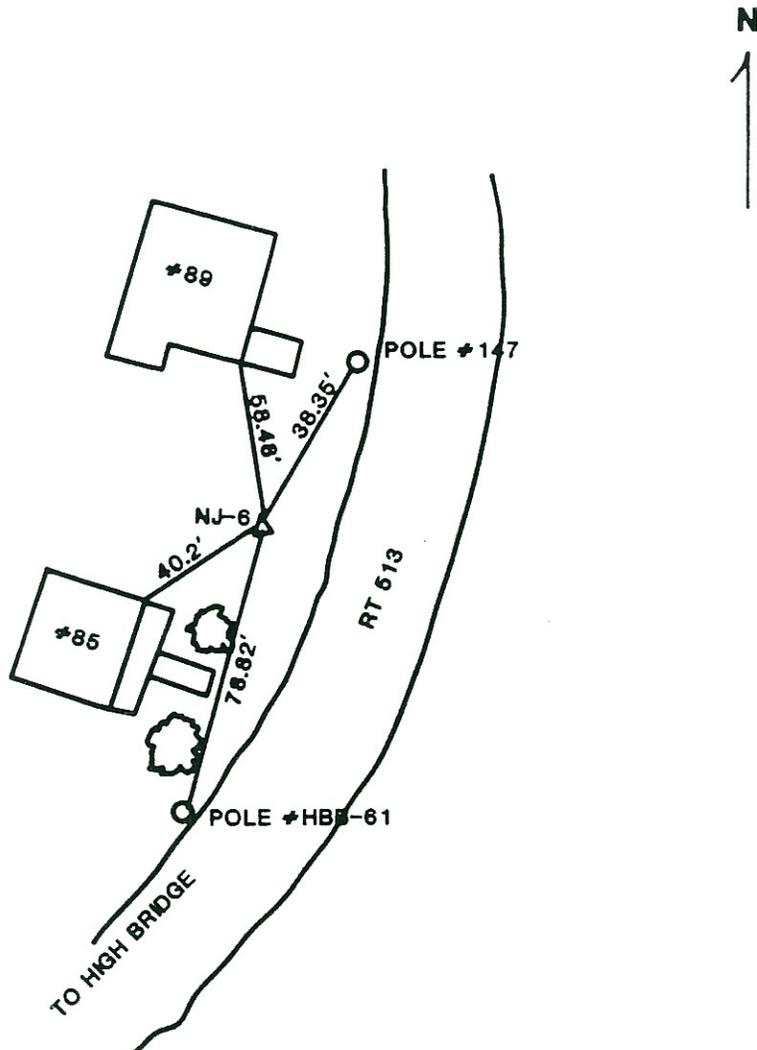
LONGITUDE DEGREES: 74 MINUTES: 53.563

ELEVATION: 534.314 FEET 162.859 METERS

GRAVITY: 980174.314

DESCRIPTION: STANDARD DISK SET IN CONCRETE IN TOP OF SLOPE TO TERRACE ON WEST SIDE OF RTE. 513, A MACADAM ROAD RUNNING NORTHEASTERLY FROM JUNCTION WITH RTE. 31 THROUGH HIGH BRIDGE, CALIFON, MIDDLE VALLEY TO LONG VALLEY. THE MONUMENT IS ABOUT 0.65 MILES NORTH OF THE CENTER OF HIGH BRIDGE. THE MONUMENT IS 27.5 FT. WEST OF CENTERLINE 78.82 FT. NW OF TACK IN POLE HBB-61, 38.35 FT. SOUTH OF POLE #147

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-7

MUNICIPALITY: LAMBERTVILLE CITY

BENCHMARK: MON. 7633

USGS QUADRANGLE: LAMBERTVILLE

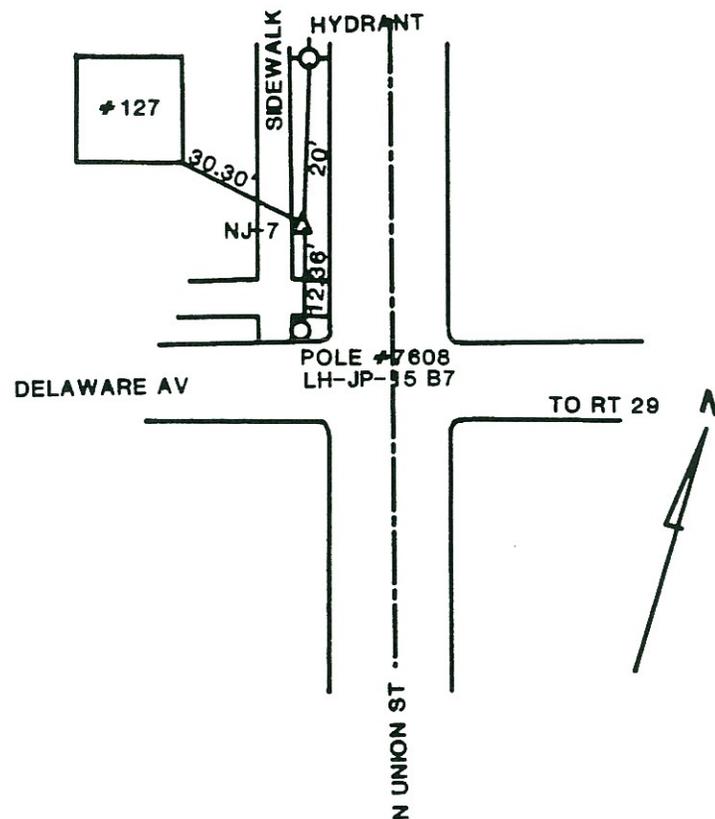
LATITUDE DEGREES: 40 MINUTES: 22.250

LONGITUDE DEGREES: 74 MINUTES: 56.822

ELEVATION: 78.699 FEET 23.986 METERS GRAVITY: 980164.195

DESCRIPTION: A STANDARD N.J.G.C.S. DISC SET IN CONCRETE. ON W. SIDE OF N. UNION ST., N. OF INTERSECTION WITH DELAWARE AVE. 4 INCHES UNDER GROUND. MONUMENT IS 12.36 FT. N. OF NAIL IN POLE #70608 LH-JP-15 B7, AND 20 FT. S. OF FIRE HYDRANT.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-8

MUNICIPALITY: DELAWARE TWP.

BENCHMARK: MON. 27637

USGS QUADRANGLE: LUMBERVILLE

LATITUDE DEGREES: 40 MINUTES: 26.783

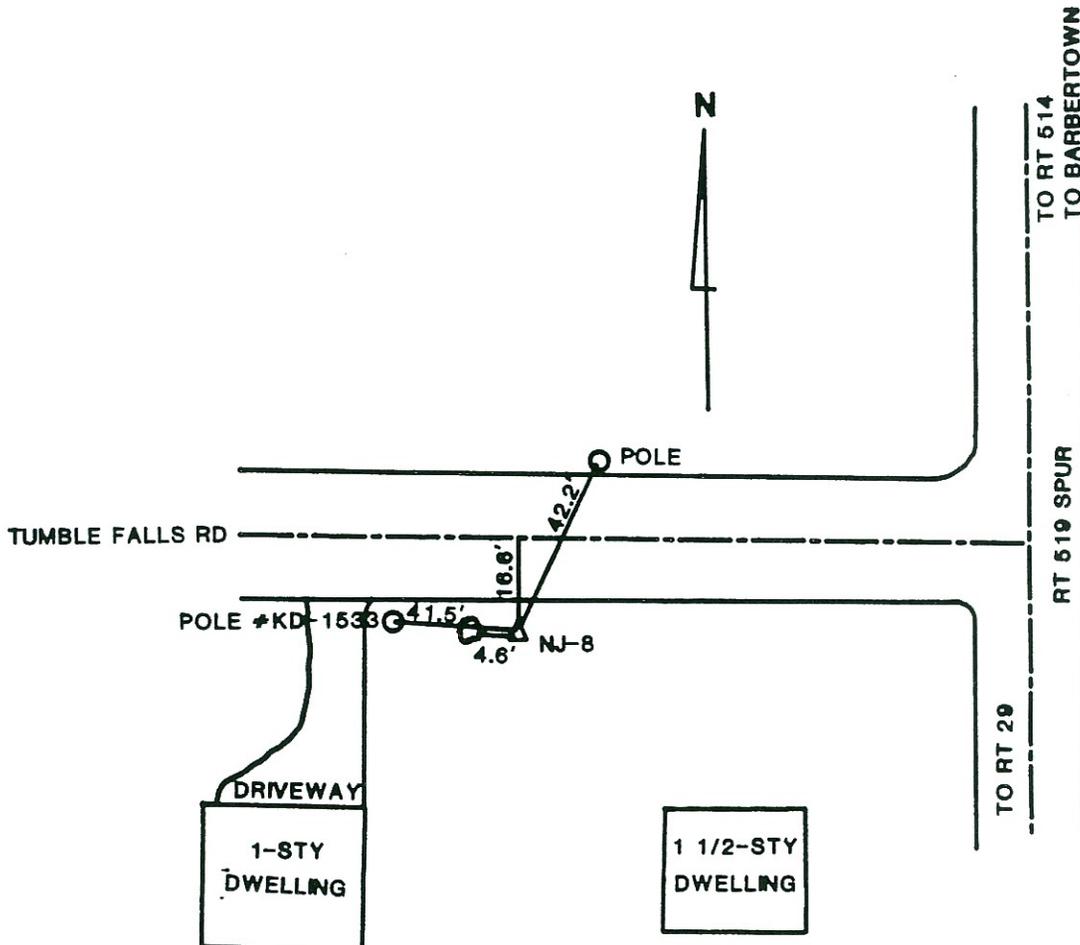
LONGITUDE DEGREES: 75 MINUTES: 2.643

ELEVATION: 543.000 FEET 165.458 METERS GRAVITY: 980137.489

DESCRIPTION: A STANDARD N.J.G.C.S. DISC SET IN CONCRETE ABOUT 0.3 FT. ABOVE THE GROUND. ABOUT 0.1 MILES W. OF INTERSECTION OF SPUR RTE. 519 AND TUMBLE FALLS RD., ON S. SIDE OF TUMBLE FALLS RD. 41.5 FT. EAST OF POLE KD-1533.

NOTE: ELEVATION ESTIMATED FROM A 7.5' USGS QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SOMERSET

STATION: NJ-9

MUNICIPALITY: BEDMINSTER TWP.

BENCHMARK: MON. 1748

USGS QUADRANGLE: GLADSTONE

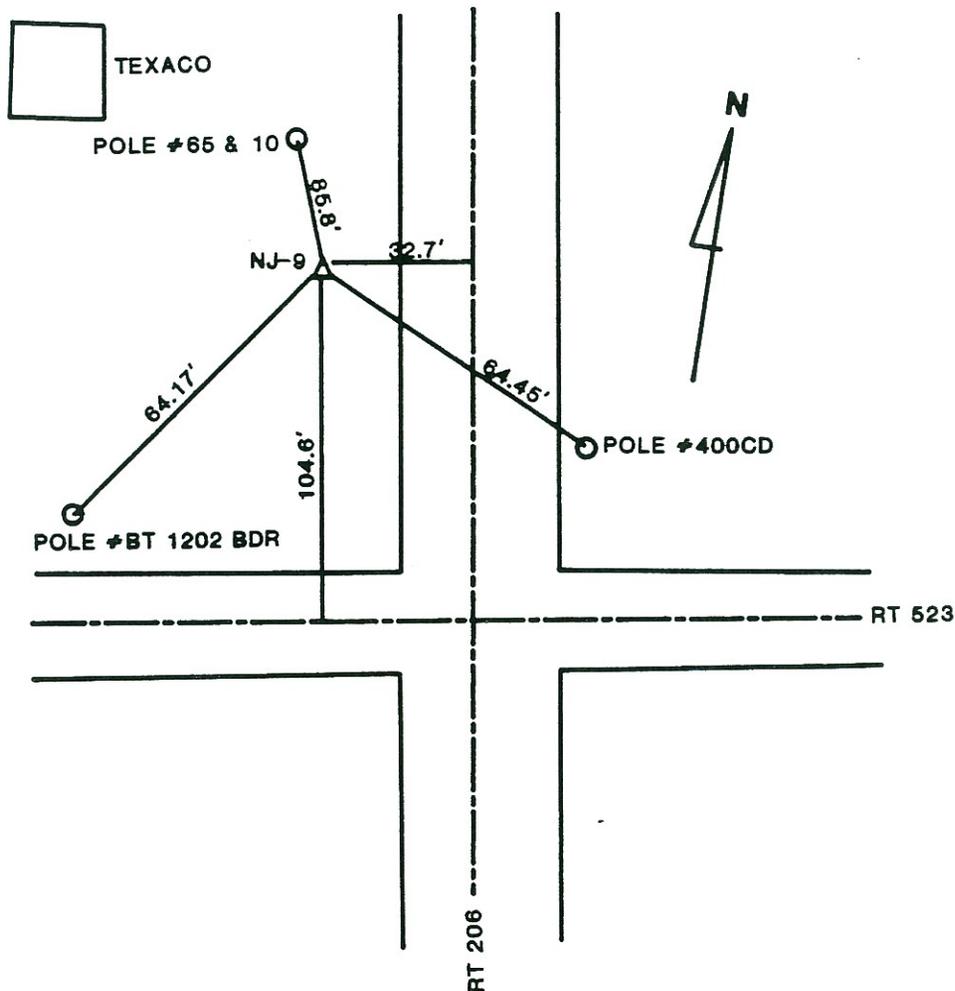
LATITUDE DEGREES: 40 MINUTES: 40.757

LONGITUDE DEGREES: 74 MINUTES: 39.031

ELEVATION: 197.733 FEET 60.266 METERS GRAVITY: 980195.090

DESCRIPTION: LOCATED NW OF INTERSECTION OF COUNTY RTE. 523 AND U.S. RTE. 206, IN FRONT OF TEXACO GAS STATION. 85.8 FT. FROM POLE #65 & 10, 64.17 FT. FROM POLE # BT 1202 BDR. STANDARD USC & GS & SS DISK SET IN CONCRETE 0.5 FT. BELOW GROUND SURFACE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MORRIS

STATION: NJ-10

MUNICIPALITY: CHESTER BORO

BENCHMARK: MON. 2372

USGS QUADRANGLE: CHESTER

LATITUDE DEGREES: 40 MINUTES: 47.155

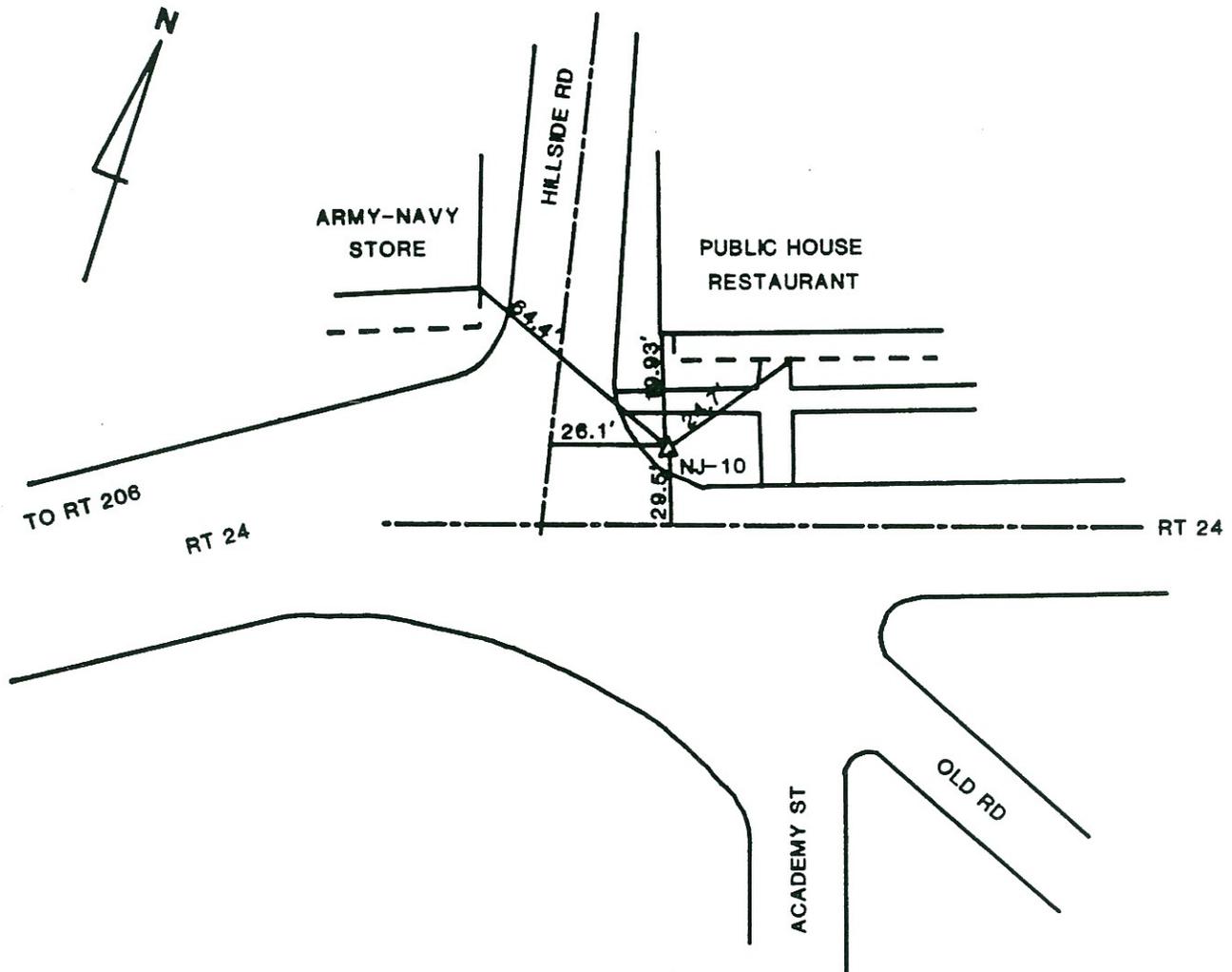
LONGITUDE DEGREES: 74 MINUTES: 41.721

ELEVATION: 854.925 FEET 260.568 METERS

GRAVITY: 980168.682

DESCRIPTION: LOCATED AT THE INTERSECTION OF MAIN ST. (RTE. 24), OLD RD., ACADEMY ST., AND HILLSIDE RD. IT IS ON THE NORTHEAST CORNER IN FRONT OF THE PUBLIC HOUSE AND IS 0.3 FT. BELOW THE SIDEWALK. A STANDARD USC & GS & SS DISK SET IN CONCRETE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-11

MUNICIPALITY: BYRAM TWP.

BENCHMARK: MON. 5405

USGS QUADRANGLE: STANHOPE

LATITUDE DEGREES: 40 MINUTES: 55.689

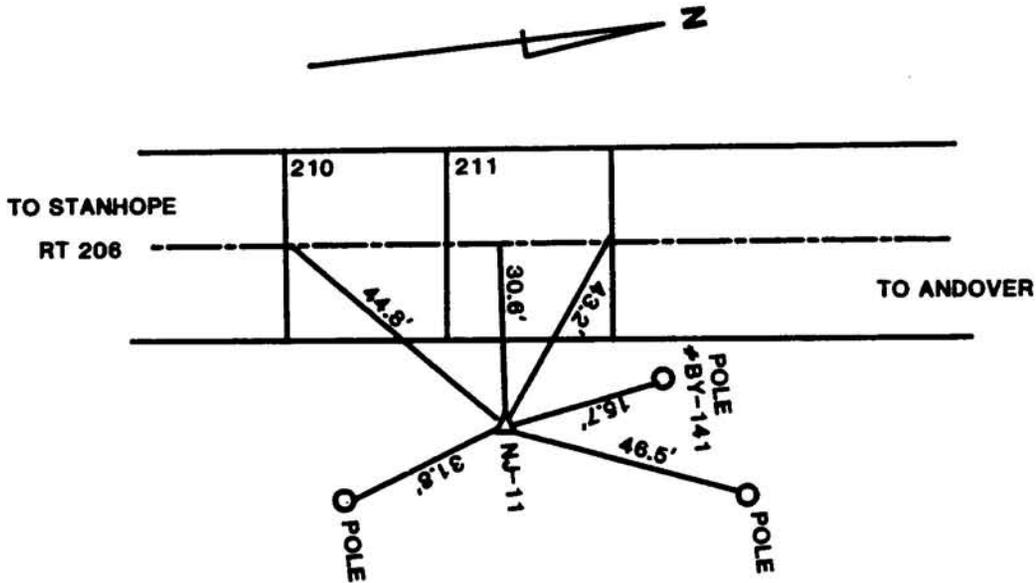
LONGITUDE DEGREES: 74 MINUTES: 41.147

ELEVATION: 682.389 FEET 208.045 METERS

GRAVITY: 980183.430

DESCRIPTION: A STANDARD USC & GS & SS DISK SET IN CONCRETE ABOUT 0.30 MILES SOUTH OF THE INTERSECTION OF US ROUTE 206 AND ROAD LEADING TO LAKE LACKAWANNA. ACCROSS THE STREET FROM A SCRAP METAL DEALER

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-12

MUNICIPALITY: NEWTON TOWN

BENCHMARK: MK. 2479

USGS QUADRANGLE: NEWTON WEST

LATITUDE DEGREES: 41 MINUTES: 3.467

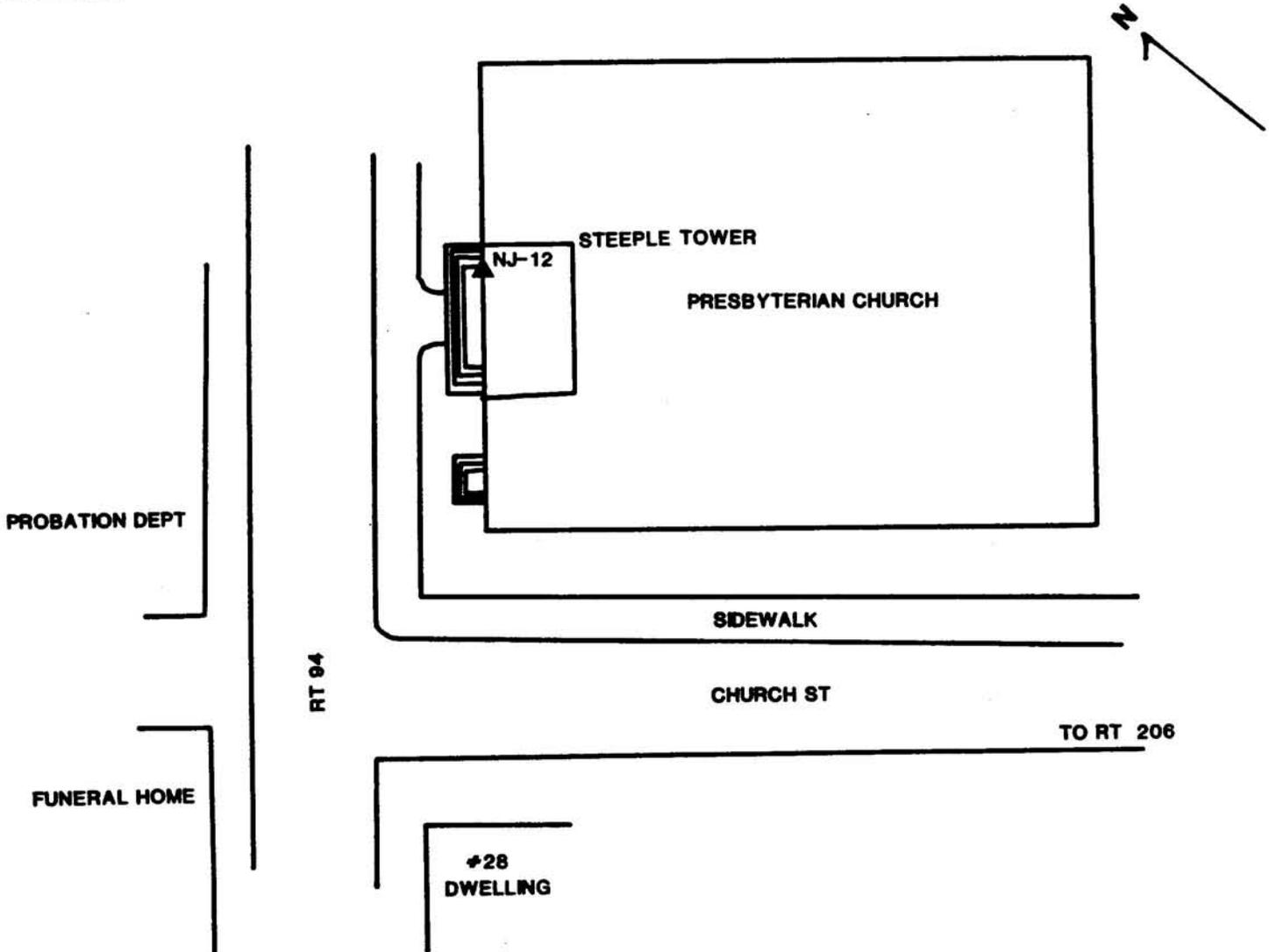
LONGITUDE DEGREES: 74 MINUTES: 45.283

ELEVATION: 678.878 FEET 206.975 METERS

GRAVITY: 980193.185

DESCRIPTION: IN THE EAST END OF THE STONE DOOR SILL AT THE CORNER OF THE DOOR JAMB AT THE ENTRANCE TO THE PRESBYTERIAN CHURCH (A CHISELED CROSS).

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-13

MUNICIPALITY: BRANCHVILLE BORO

BENCHMARK: NJGS 578.35

USGS QUADRANGLE: CULVERS GAP

LATITUDE DEGREES: 41 MINUTES: 8.800

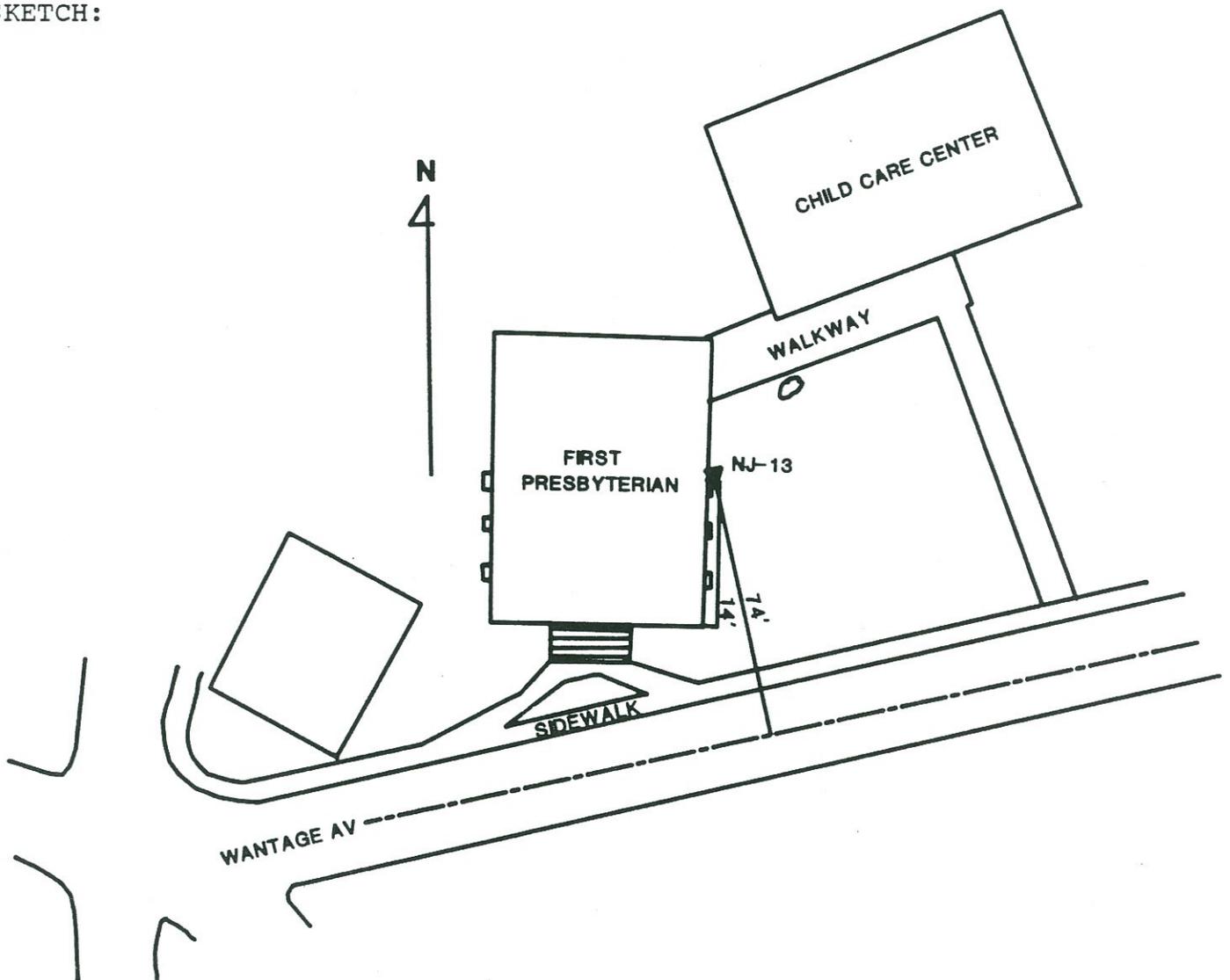
LONGITUDE DEGREES: 74 MINUTES: 45.133

ELEVATION: 575.990 FEET 175.605 METERS

GRAVITY: 980205.392

DESCRIPTION: A CROSS CUT IN THE NORTHEAST CORNER OF A LIMESTONE CORNER STONE INSCRIBED "PRESBYTERIAN CHURCH OF BRANCHVILLE A.D. 1856". THIS STONE IS SET IN THE EAST SIDE OF THE BUILDING IN THE MIDDLE ONE OF THREE ATTACHED PILLARS. THE CHURCH IS NEAR THE INTERSECTION OF WANTAGE AVE. AND BROAD ST. THE READING WAS TAKEN ON THE GROUND ABOUT 3 FEET BELOW THE MARK.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MORRIS

STATION: NJ-14

MUNICIPALITY: ROCKAWAY TWP.

BENCHMARK: MON 4319

USGS QUADRANGLE: BOONTON

LATITUDE DEGREES: 40 MINUTES: 54.380

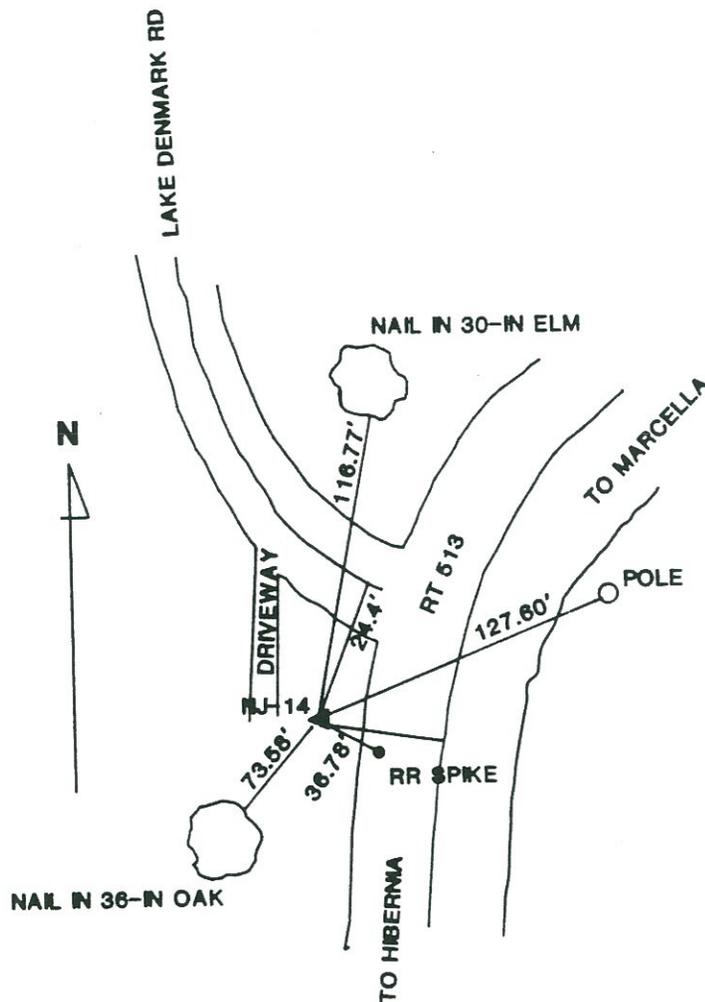
LONGITUDE DEGREES: 74 MINUTES: 24.289

ELEVATION: 425.782 FEET 129.740 METERS

GRAVITY: 980180.160

DESCRIPTION: LOCATED ON THE WEST SIDE OF RTE. 513 JUST
SOUTHWEST OF THE INTERSECTION OF RTE. 513 AND LAKE DENMARK RD.
MONUMENT IS FLUSH WITH THE GROUND.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MORRIS

STATION: NJ-15

MUNICIPALITY: MORRISTOWN TOWN

BENCHMARK: MON 5306

USGS QUADRANGLE: MORRISTOWN

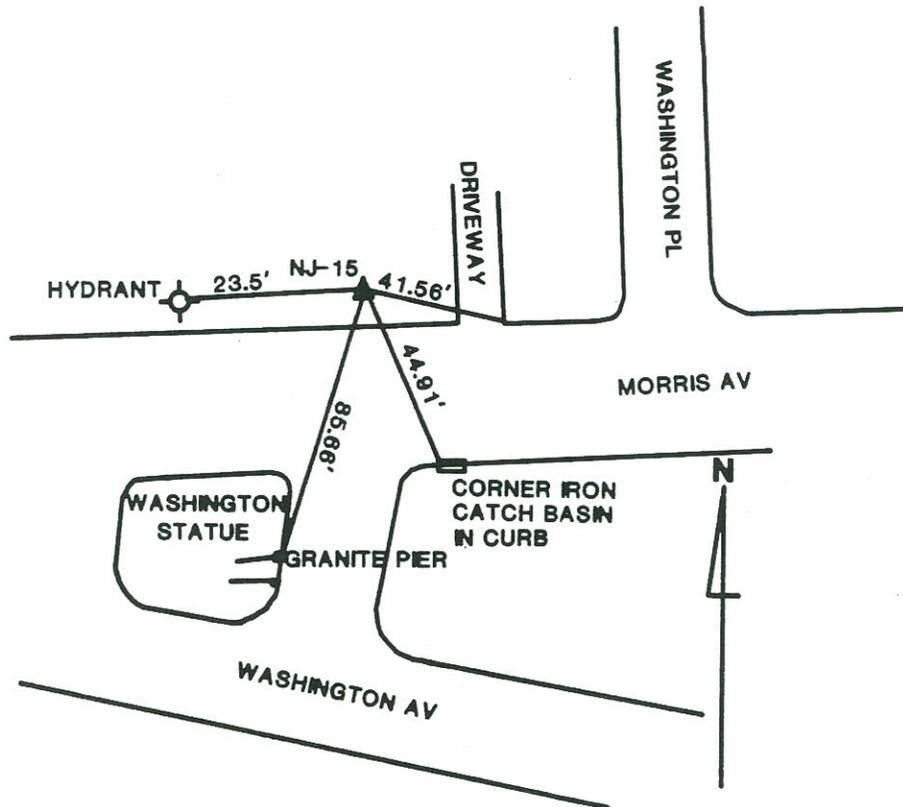
LATITUDE DEGREES: 40 MINUTES: 47.759

LONGITUDE DEGREES: 74 MINUTES: 38.873

ELEVATION: 354.550 FEET 108.095 METERS GRAVITY: 980198.480

DESCRIPTION: LOCATED ON THE NORTH SIDE OF RTE. 510, EAST OF RTE. 287, ACROSS THE STREET FROM THE GEORGE WASHINGTON STATUE (CLOSE TO THE FIRE HYDRANT).

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MORRIS

STATION: NJ-16

MUNICIPALITY: BOONTON TOWN

BENCHMARK: MON 5317

USGS QUADRANGLE: BOONTON

LATITUDE DEGREES: 40 MINUTES: 54.380

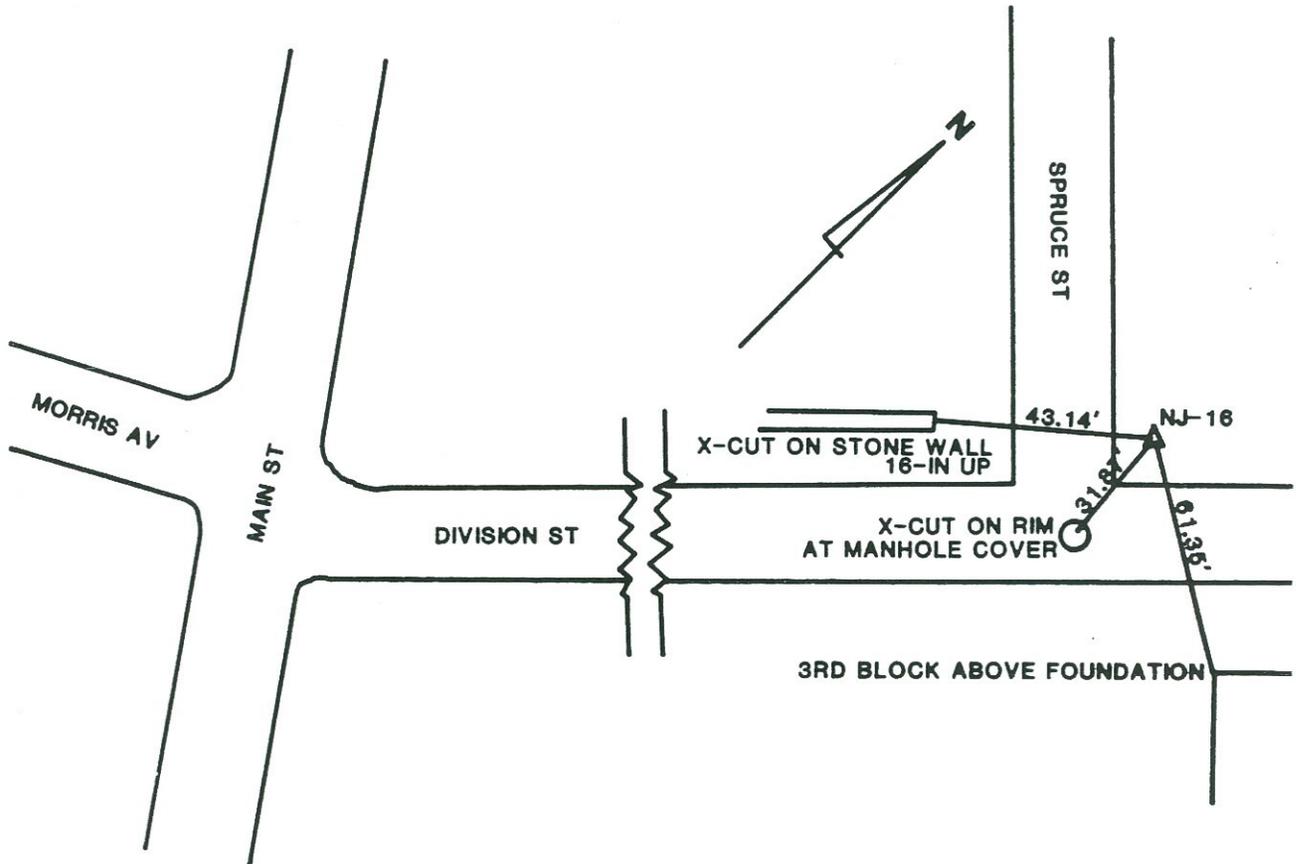
LONGITUDE DEGREES: 74 MINUTES: 24.289

ELEVATION: 425.782 FEET 129.812 METERS

GRAVITY: 980210.860

DESCRIPTION: FOUND ON THE NORTH CORNER OF SPRUCE ST. AND DIVISION ST. (EAST OF MAIN ST.). THE MONUMENT IS 43.74 FT. FROM AN "X" CUT ON STONE WALL ON THE NW. CORNER OF DIVISION ST. AND SPRUCE ST. AND 31.87 FT. FROM AN "X" ON THE MANHOLE COVER IN THE INTERSECTION. MONUMENT IS A STANDARD NJGS DISC.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: PASSAIC

STATION: NJ-17

MUNICIPALITY: WANAQUE TWP. (MIDVALE)

BENCHMARK: MON 7543

USGS QUADRANGLE: WANAQUE

LATITUDE DEGREES: 41 MINUTES: 3.527

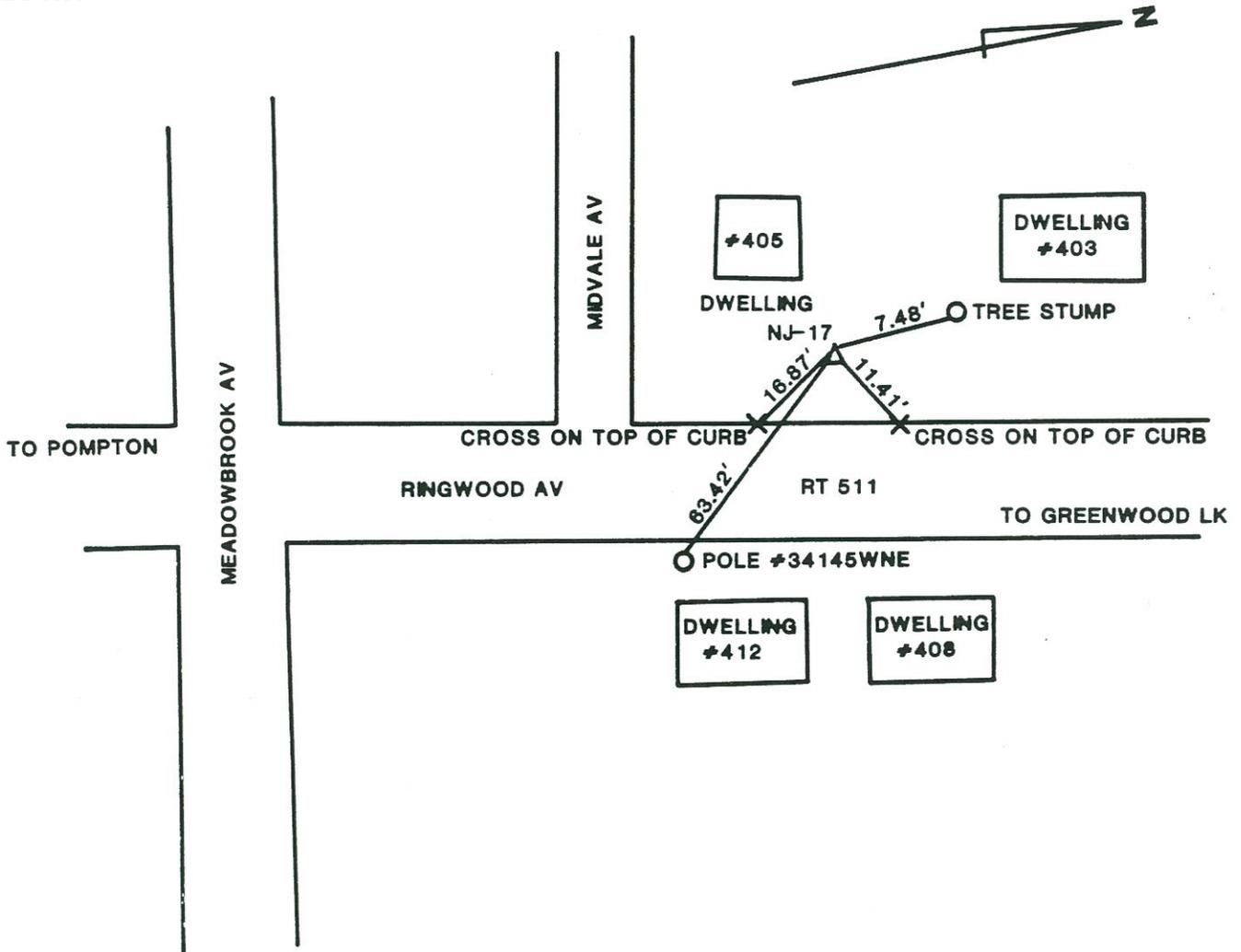
LONGITUDE DEGREES: 74 MINUTES: 17.195

ELEVATION: 262.820 FEET 80.128 METERS

GRAVITY: 980231.560

DESCRIPTION: LOCATED ON THE WEST SIDE OF RINGWOOD AVE. ABOUT 500 FT. NORTH OF MEADOWBROOK AVE. THE MONUMENT IS IN THE NORTHEAST CORNER OF THE ASPHALT DRIVEWAY AT HOUSE NUMBER 405.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: PASSAIC

STATION: NJ-18

MUNICIPALITY: WEST MILFORD TWP. (BROWNS)

BENCHMARK: NONE

USGS QUADRANGLE: GREENWOOD LAKE

LATITUDE DEGREES: 41 MINUTES: 9.106

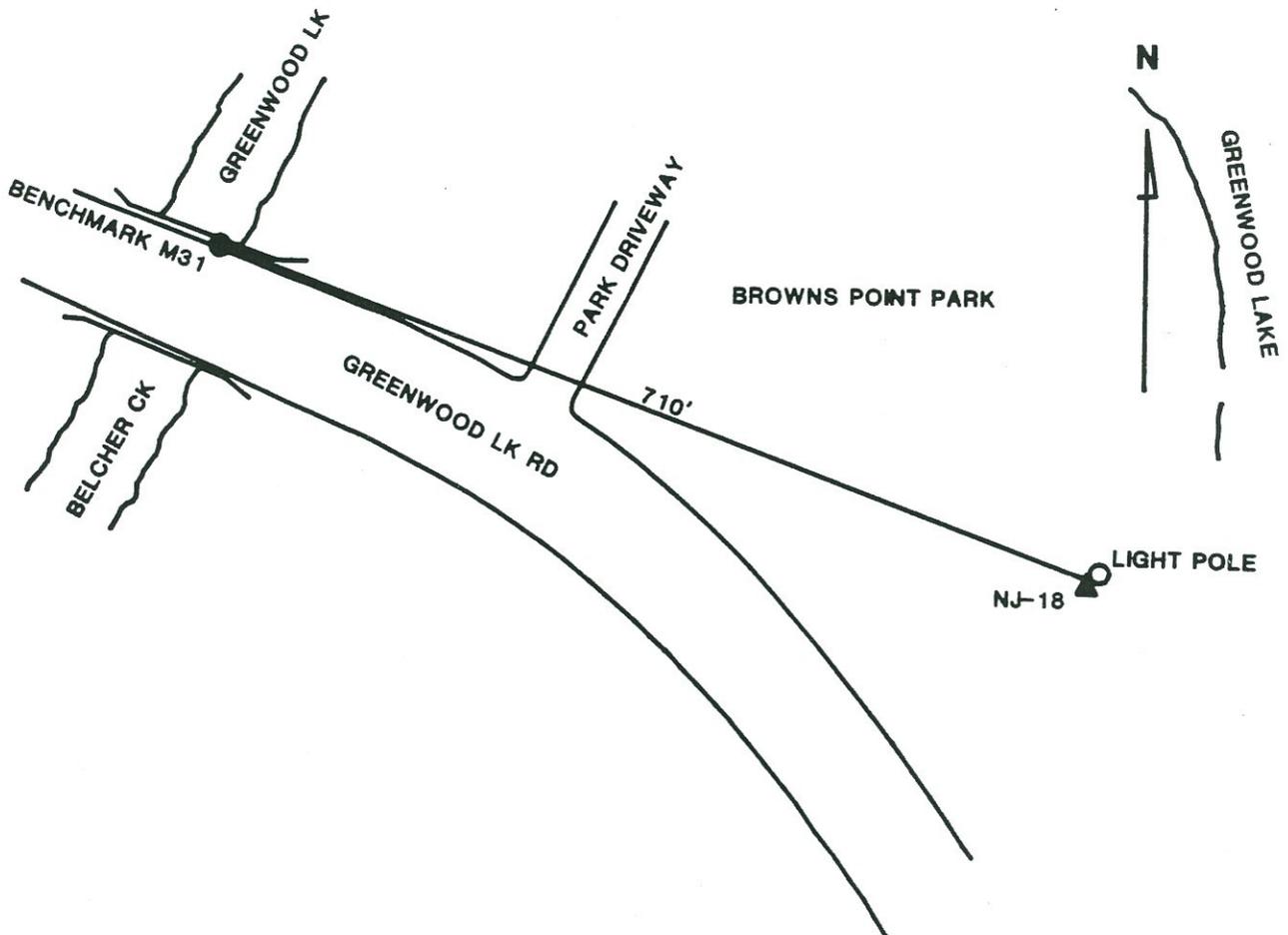
LONGITUDE DEGREES: 74 MINUTES: 20.840

ELEVATION: 642.600 FEET 195.807 METERS

GRAVITY: 980204.510

DESCRIPTION: ON GROUND ON SW SIDE OF LIGHT POLE IN PARK EAST OF GREENWOOD LAKE AND NORTH OF BEND ON GREENWOOD LAKE ROAD. ABOUT 710 FT. EAST OF BENCHMARK M31 (ON BRIDGE OVER BELCHER CREEK)

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: ESSEX

STATION: NJ-19

MUNICIPALITY: SOUTH ORANGE VILLAGE

BENCHMARK: MON. 501

USGS QUADRANGLE: ROSELLE

LATITUDE DEGREES: 40 MINUTES: 43.217

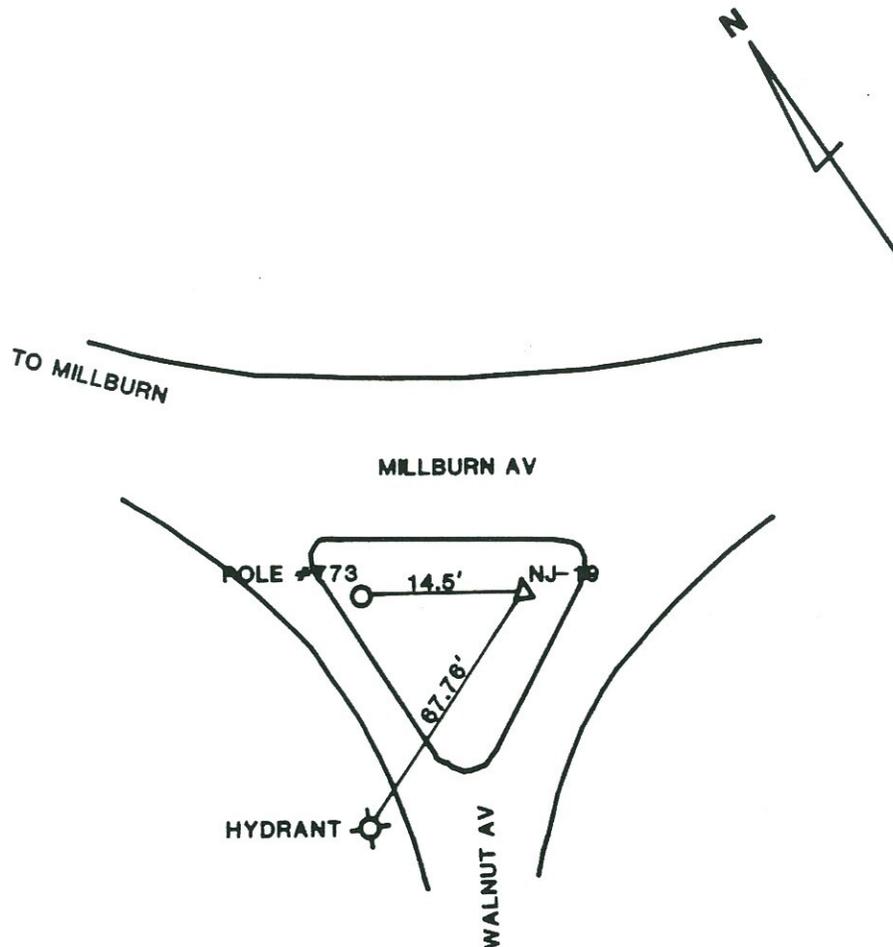
LONGITUDE DEGREES: 74 MINUTES: 17.817

ELEVATION: 139.980 FEET 42.653 METERS

GRAVITY: 980214.670

DESCRIPTION: AT THE INTERSECTION OF MILLBURN AV. AND WALNUT AV.
MONUMENT DISK IS LOCATED IN SIDEWALK, 19.5 FT. FROM POLE #773 ON THE
EASTERN CORNER OF THE TRAFFIC TRIANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MORRIS

STATION: NJ-20

MUNICIPALITY: PASSAIC TWP. (GILLETTE)

BENCHMARK: NONE

USGS QUADRANGLE: CHATHAM

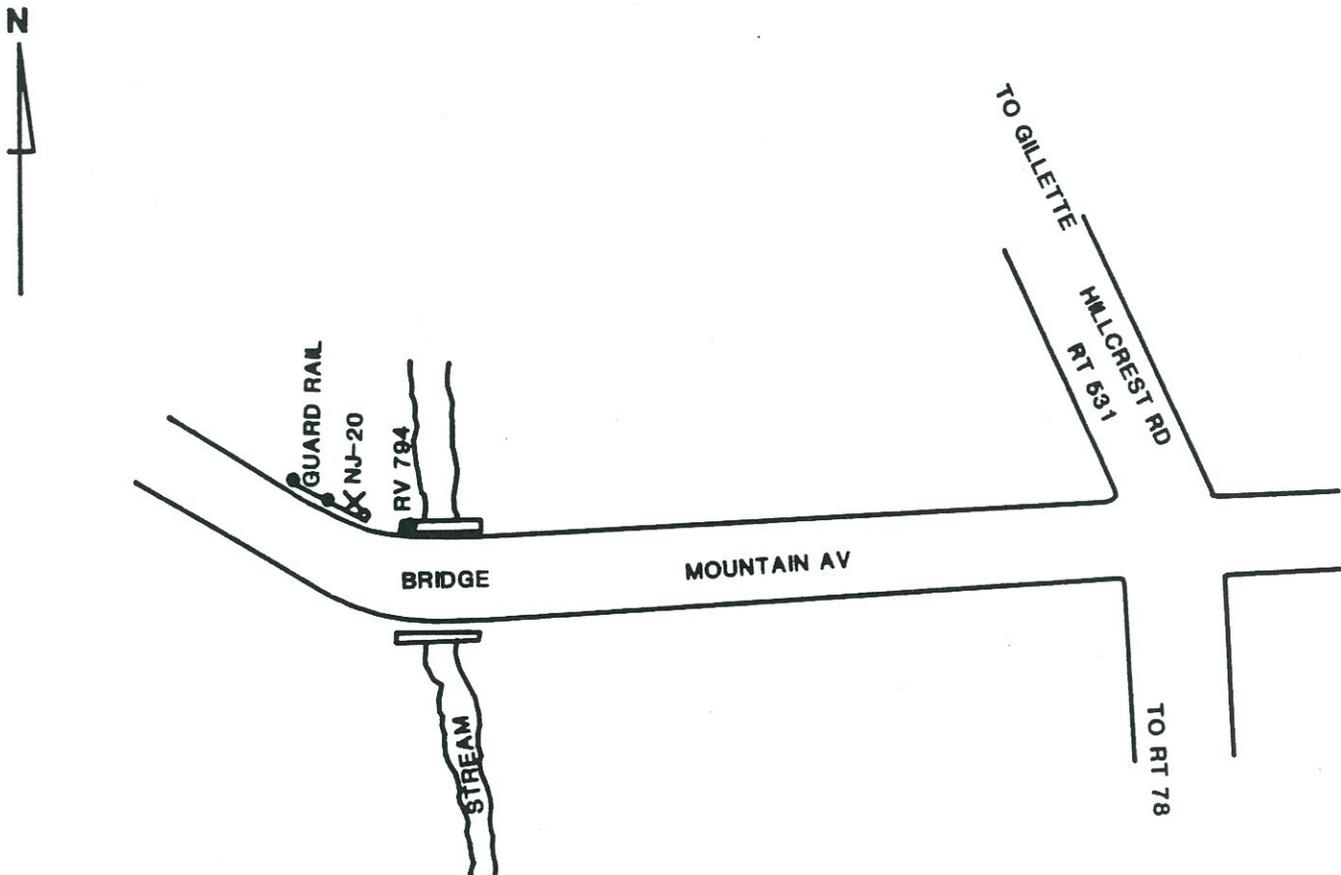
LATITUDE DEGREES: 40 MINUTES: 39.800

LONGITUDE DEGREES: 74 MINUTES: 27.500

ELEVATION: 234.000 FEET 71.302 METERS GRAVITY: 980198.610

DESCRIPTION: NEAR RV. 794 WHICH IS ON THE NORTH SIDE OF MOUNTAIN AVE. ABOUT 1.2 MI. EAST OF STIRLING RD. AND ABOUT 1300 FT. WEST OF INTERSECTION OF HILLCREST RD. AND MOUNTAIN AVE. RIVET LOCATED ON CONCRETE HEADWALL AND READING TAKEN 2 FT. NORTH OF RIVET NEXT TO GUARDRAIL POST.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-21

MUNICIPALITY: WANTAGE TWP. (COLESVILLE)

BENCHMARK: NJDCD808.39

USGS QUADRANGLE: PORT JERVIS S.

LATITUDE DEGREES: 41 MINUTES: 16.600

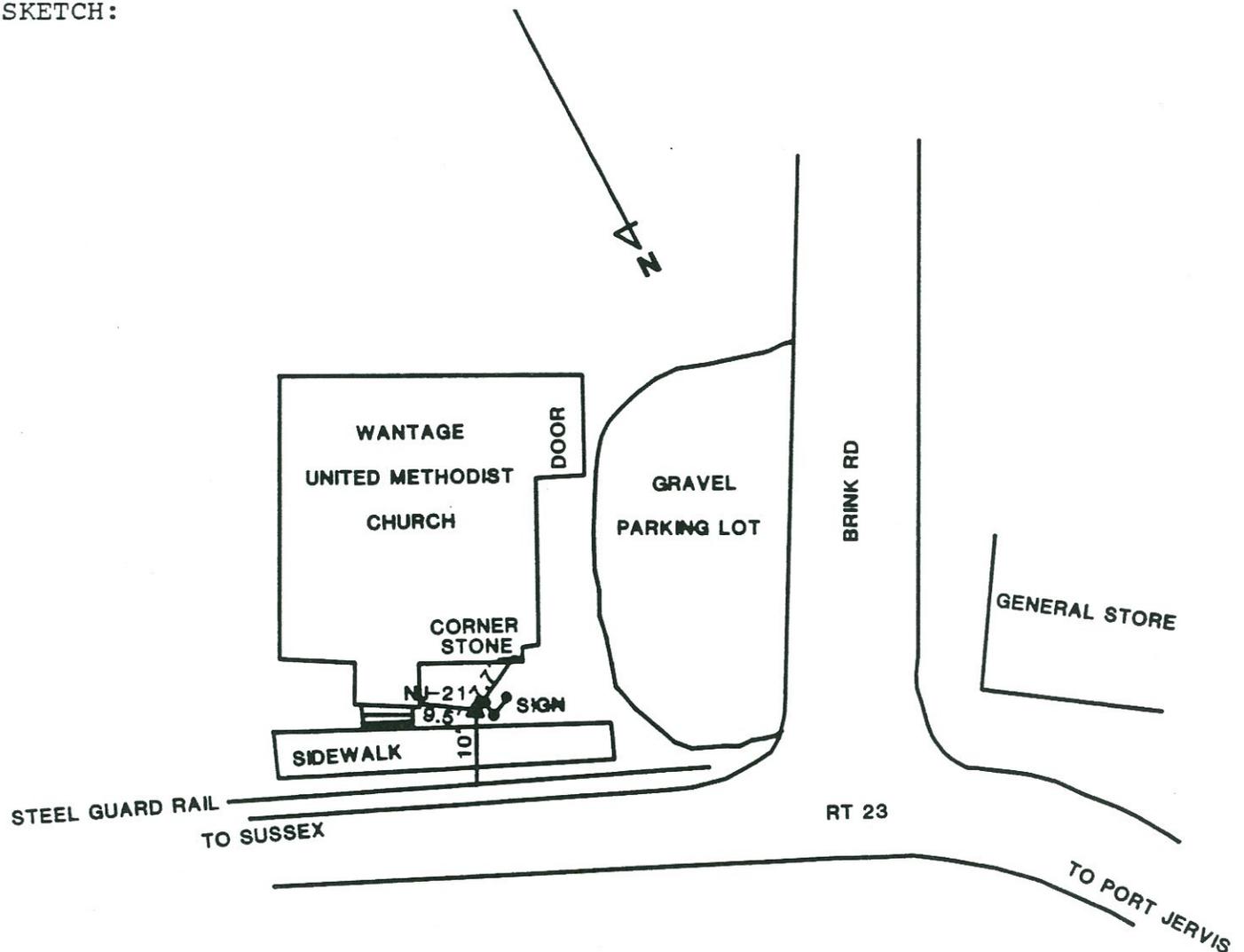
LONGITUDE DEGREES: 74 MINUTES: 39.217

ELEVATION: 808.390 FEET 246.325 METERS

GRAVITY: 980203.380

DESCRIPTION: NJDCD 808.39 AT COLESVILLE, SUSSEX COUNTY ON RTE. 23, 30 FEET WEST OF THE CENTERLINE AT THE NORTHEAST CORNER OF THE COLESVILLE METHODIST CHURCH, IN THE CORNERSTONE MARKED "1887", BETWEEN THE TWO 8'S (A CHISELED CROSS). READING TAKEN ON THE SIDEWALK NEXT TO THE SOUTHERN POST OF THE CHURCH SIGN.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-22

MUNICIPALITY: SUSSEX BORO

BENCHMARK: MON. 1933

USGS QUADRANGLE: HAMBURG

LATITUDE DEGREES: 41 MINUTES: 12.500

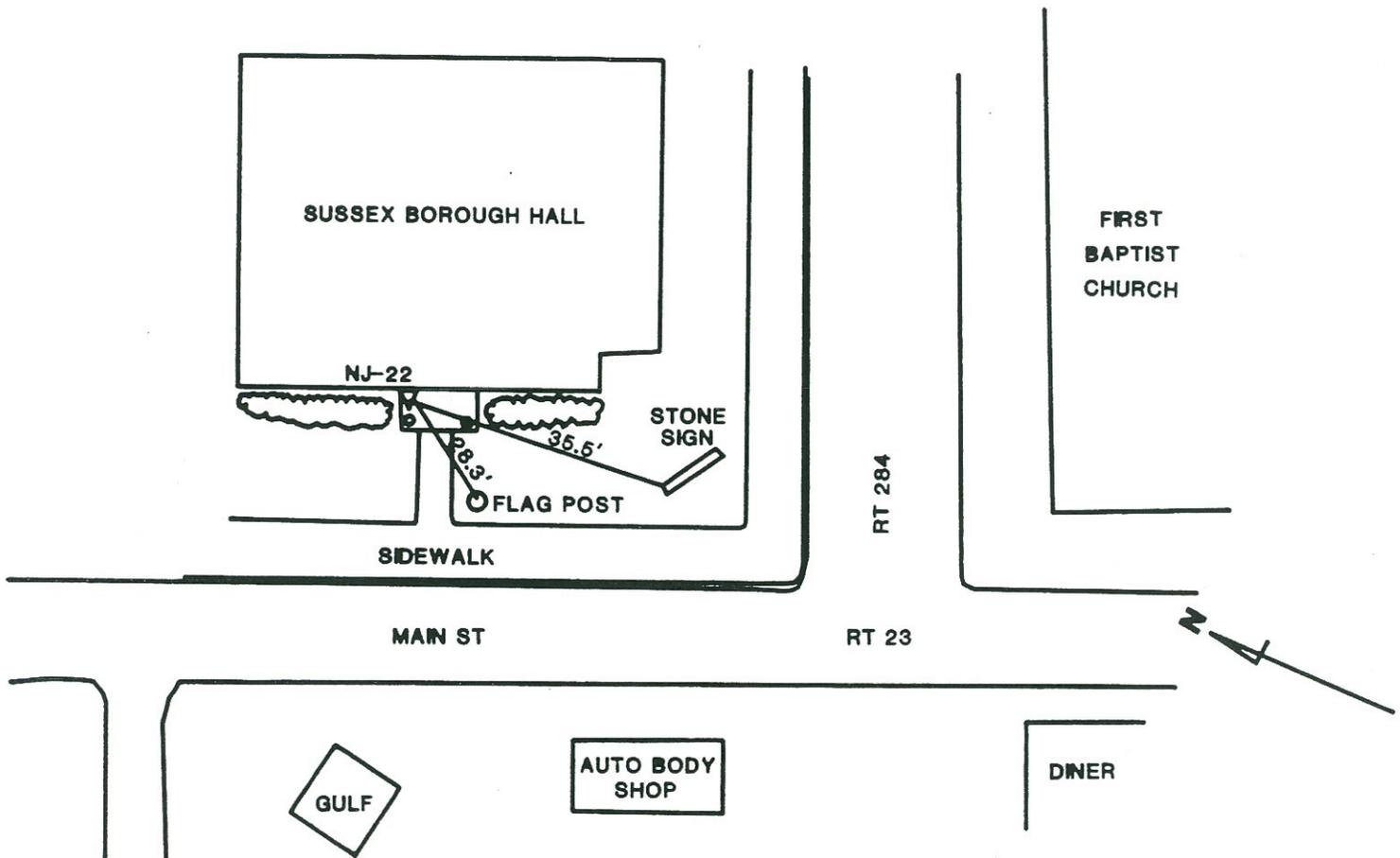
LONGITUDE DEGREES: 74 MINUTES: 36.400

ELEVATION: 417.201 FEET 127.126 METERS

GRAVITY: 980223.040

DESCRIPTION: AT SUSSEX, SUSSEX COUNTY, 54 FT. NORTH OF THE NORTH CURB OF EAST MAIN ST, AT THE WEST ENTRANCE TO THE BOROUGH HALL, IN THE NORTH END OF THE BRICK PORCH, AND ABOUT 1 FOOT HIGHER THAN THE SIDEWALK. A STANDARD DISK STAMPED "417.201 SUSSEX 1933"

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: PASSAIC

STATION: NJ-23

MUNICIPALITY: WAYNE TWP.

BENCHMARK: NONE

USGS QUADRANGLE: PATERSON

LATITUDE DEGREES: 40 MINUTES: 57.650

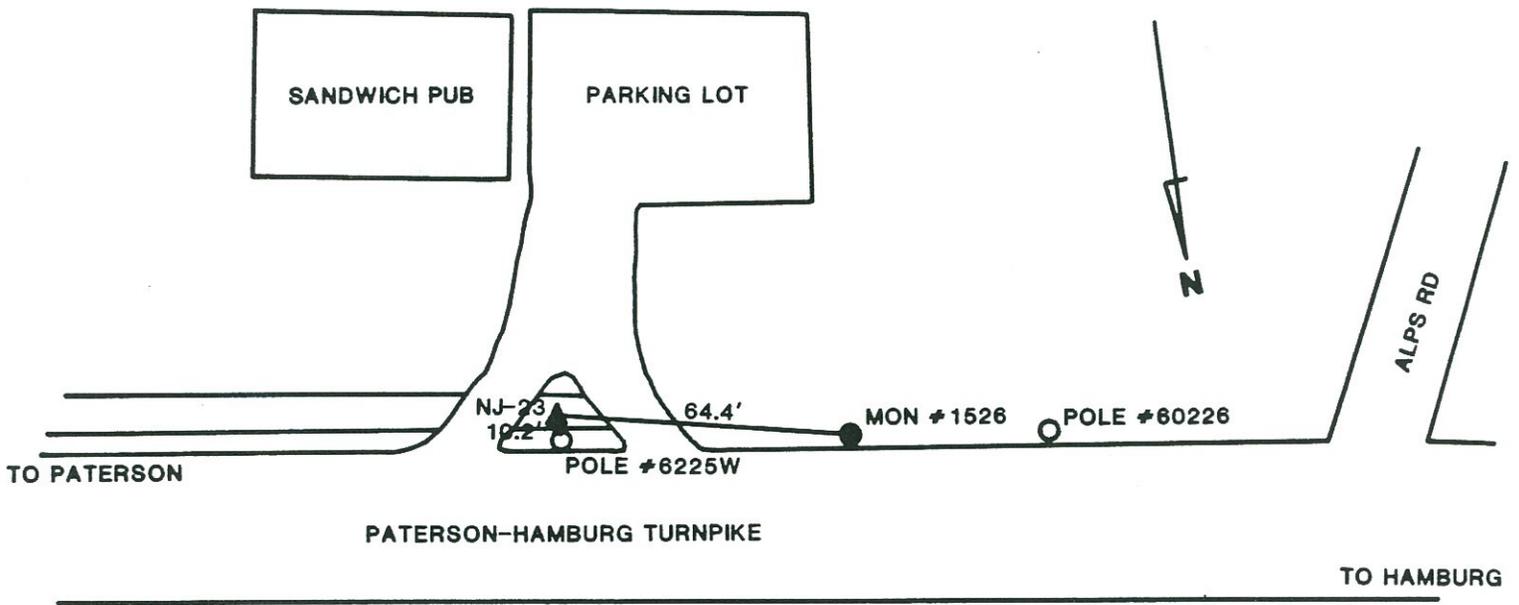
LONGITUDE DEGREES: 74 MINUTES: 14.667

ELEVATION: 335.000 FEET 102.000 METERS

GRAVITY: 980217.430

DESCRIPTION: 64.4 FT. SE OF MON 1526. LOCATED ON SIDEWALK OF THE CENTER TRIANGLE OF THE DRIVEWAY TO THE SANDWICH PUB. STATION IS 10.2 FT. SOUTH OF POLE #6225 W

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-24

MUNICIPALITY: WASHINGTON BORO

BENCHMARK: NONE

USGS QUADRANGLE: WASHINGTON

LATITUDE DEGREES: 40 MINUTES: 45.550

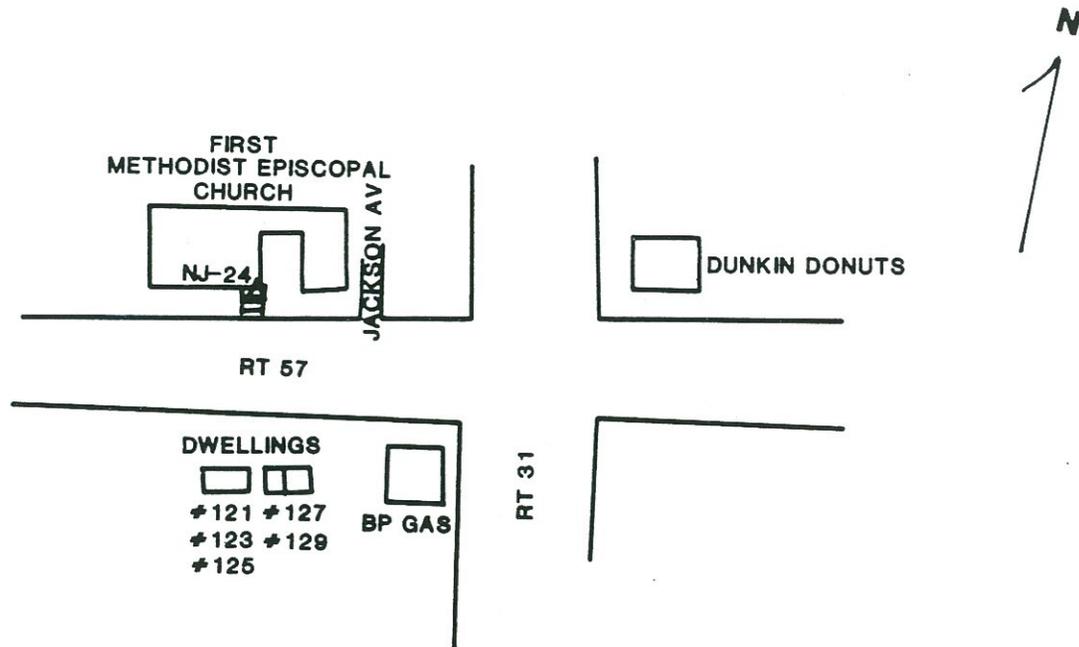
LONGITUDE DEGREES: 74 MINUTES: 58.650

ELEVATION: 471.500 FEET 143.671 METERS GRAVITY: 980176.490

DESCRIPTION: ON STEPS INTO MAIN ENTRANCE OF THE FIRST METHODIST EPISCOPAL CHURCH IN WASHINGTON. CHURCH IS ON THE NORTH SIDE OF RTE. 57, WEST OF THE INTERSECTION WITH RTE. 31. THE STATION IS ON THE TOP STEP, UNDER THE WESTERN EDGE OF THE CORNERSTONE. CORNERSTONE IS LOCATED UNDER THE STEEPLE.

NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-25

MUNICIPALITY: BELVIDERE TOWN

BENCHMARK: NONE

USGS QUADRANGLE: BELVIDERE

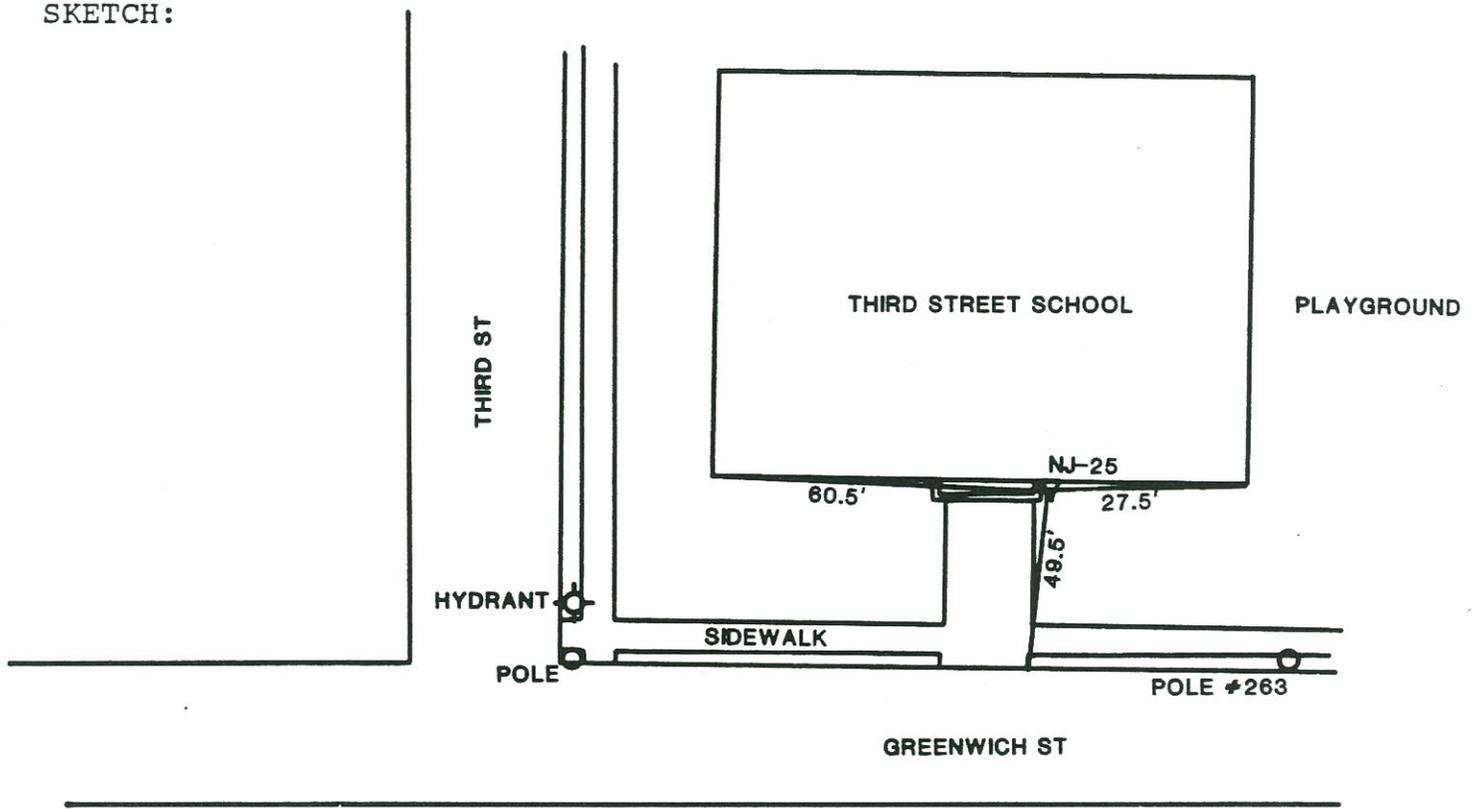
LATITUDE DEGREES: 40 MINUTES: 49.517

LONGITUDE DEGREES: 75 MINUTES: 4.750

ELEVATION: 280.800 FEET 85.319 METERS GRAVITY: 980193.130

DESCRIPTION: METAL PLATE ON SOUTHERN CORNER OF STEPS TO THE GREENWICH ST. ENTRANCE AND WALKWAY OF THE 3RD ST. SCHOOL ON GREENWICH ST. AND THIRD ST. SCHOOL IS ON THE EAST SIDE OF GREENWICH ST.
NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



DWELLING

NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-26

MUNICIPALITY: GREENWICH TWP. (STEWARTSVILLE) BENCHMARK: NONE

USGS QUADRANGLE: BLOOMSBURY

LATITUDE DEGREES: 40 MINUTES: 41.667

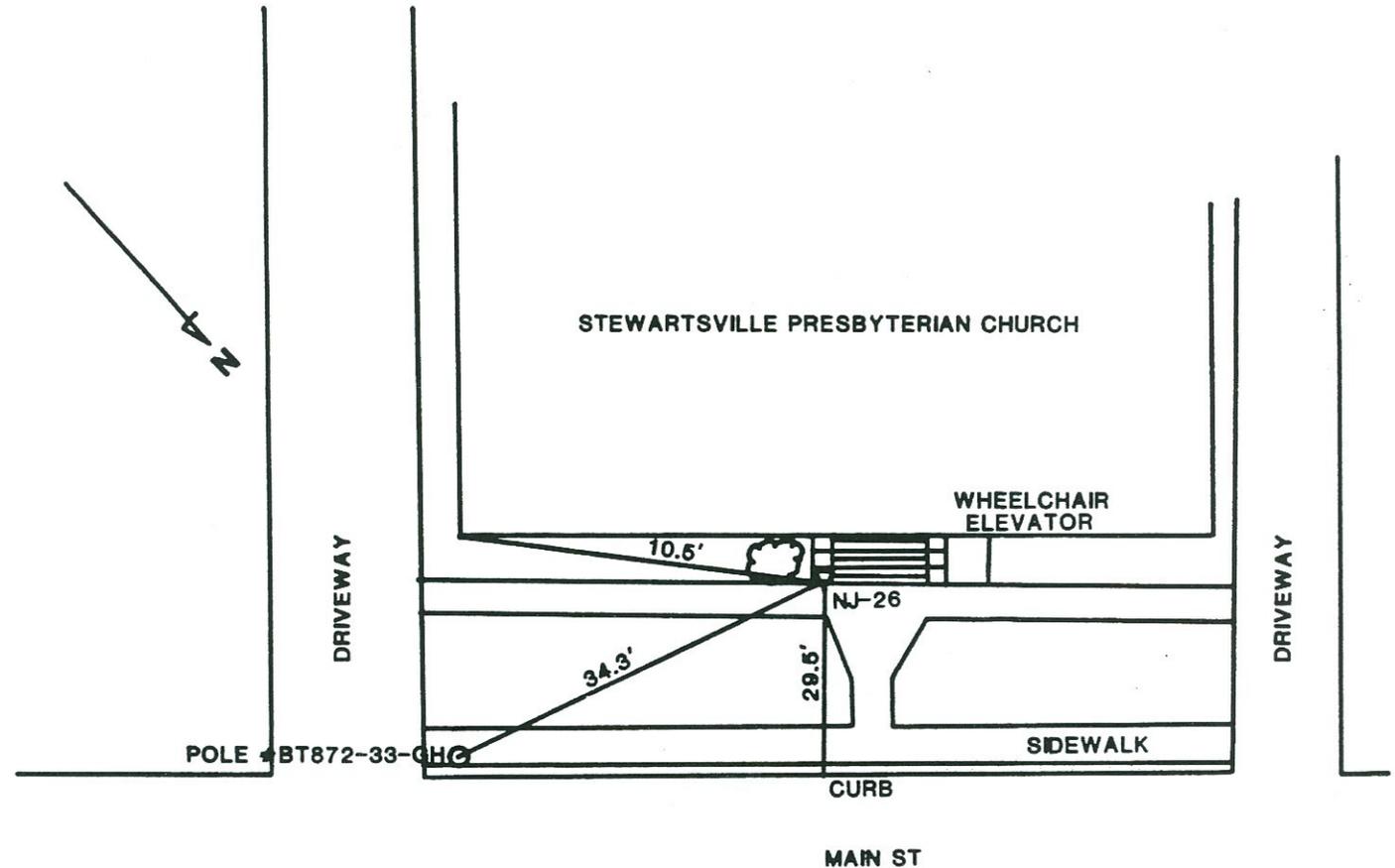
LONGITUDE DEGREES: 75 MINUTES: 6.767

ELEVATION: 315.000 FEET 95.984 METERS GRAVITY: 980174.340

DESCRIPTION: ON SOUTHERN CORNER OF THE FIRST CONCRETE STEP OF CONCRETE ABUTMENT ADJACENT TO THE ENTRANCE OF THE STEWARTSVILLE PREBYTERIAN CHURCH IN STEWARTSVILLE. CHURCH IS ON WEST SIDE OF MAIN ST. NORTH OF INTERSECTION WITH STEWARTSVILLE RD.

NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-27

MUNICIPALITY: HOPE TWP. (HOPE)

BENCHMARK: NONE

USGS QUADRANGLE: BLAIRSTOWN

LATITUDE DEGREES: 40 MINUTES: 54.600

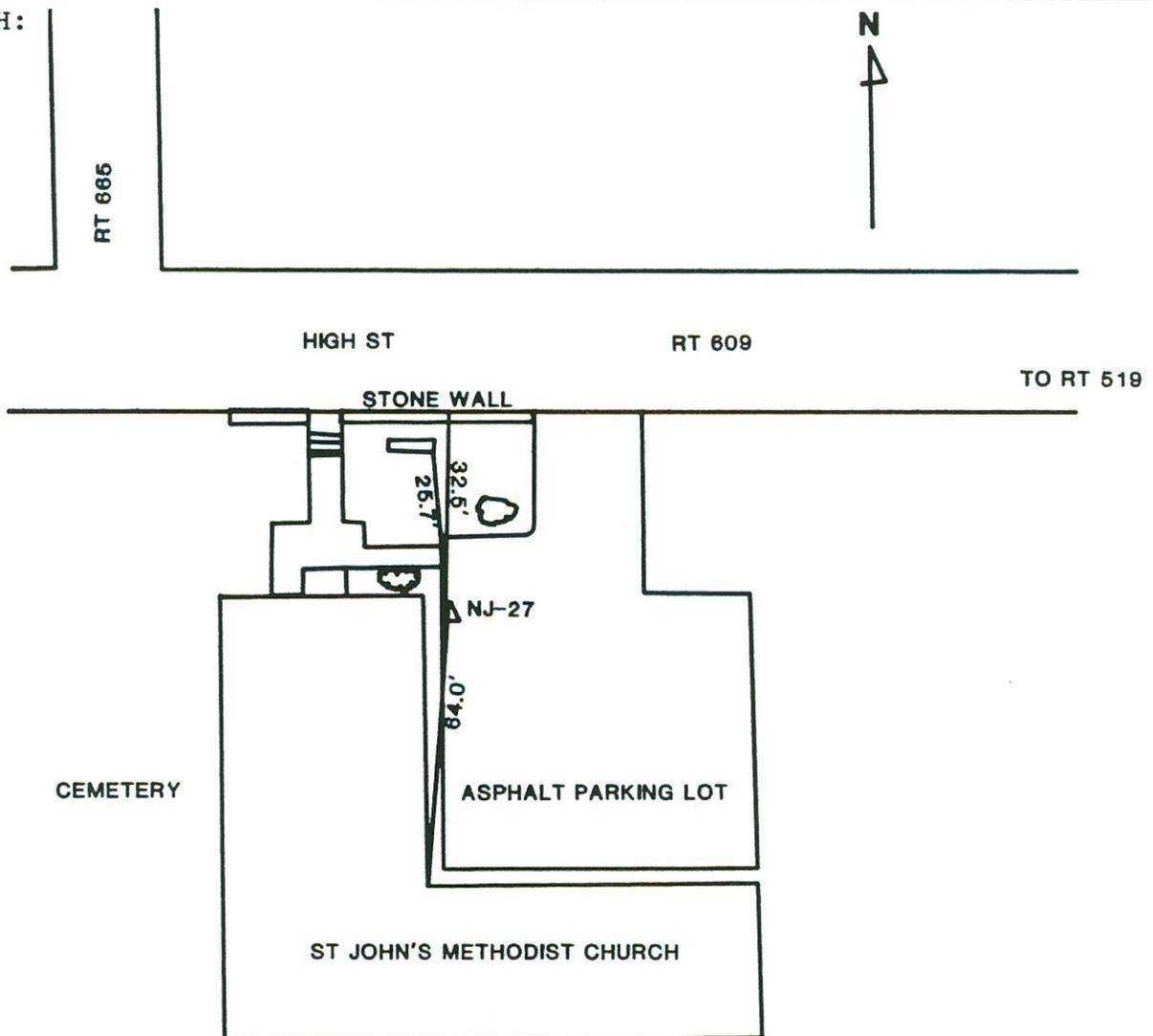
LONGITUDE DEGREES: 74 MINUTES: 58.650

ELEVATION: 463.000 FEET 141.000 METERS GRAVITY: 980192.770

DESCRIPTION: READINGS TAKEN AT METAL DISC AT THE NORTHEAST CORNER OF THE METHODIST EPISCOPAL CHURCH ON HIGH ST. THE METAL DISK IS LOCATED AT THE NORTHEAST CORNER OF THE ASPHALT PARKING LOT.

NOTE: ELEVATION DETERMINED USING A BAROMETRIC ALTIMETER

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-28

MUNICIPALITY: PAHAQUARRY TWP. (MILLBROOK)

BENCHMARK: MON. Z33

USGS QUADRANGLE: FLATBROOKVILLE

LATITUDE DEGREES: 41 MINUTES: 4.350

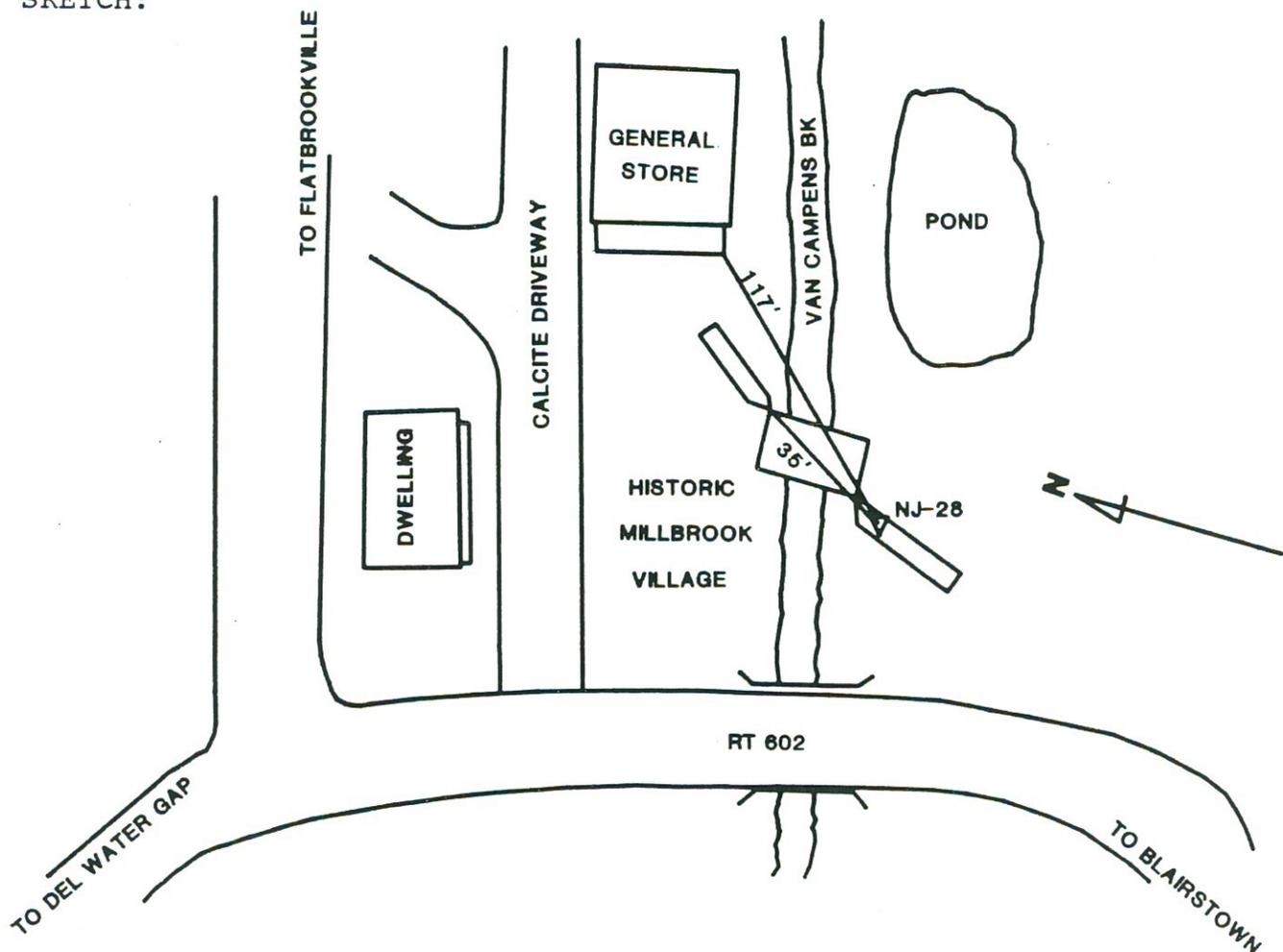
LONGITUDE DEGREES: 73 MINUTES: 57.783

ELEVATION: 659.000 FEET 201.000 METERS

GRAVITY: 980187.700

DESCRIPTION: READING TAKEN ON USG+CS BENCHMARK Z33 LOCATED ON THE TOP OF THE ABANDONED BRIDGE ACCROSS VAN CAMPENS BROOK IN HISTORIC MILLBROOK VILLAGE NEXT TO THE SITE OF THE OLD GRIST MILL

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: SUSSEX

STATION: NJ-29

MUNICIPALITY: WALPACK TWP. (WALPACK CENTER) BENCHMARK: NONE

USGS QUADRANGLE: LAKE MASKENOZHA

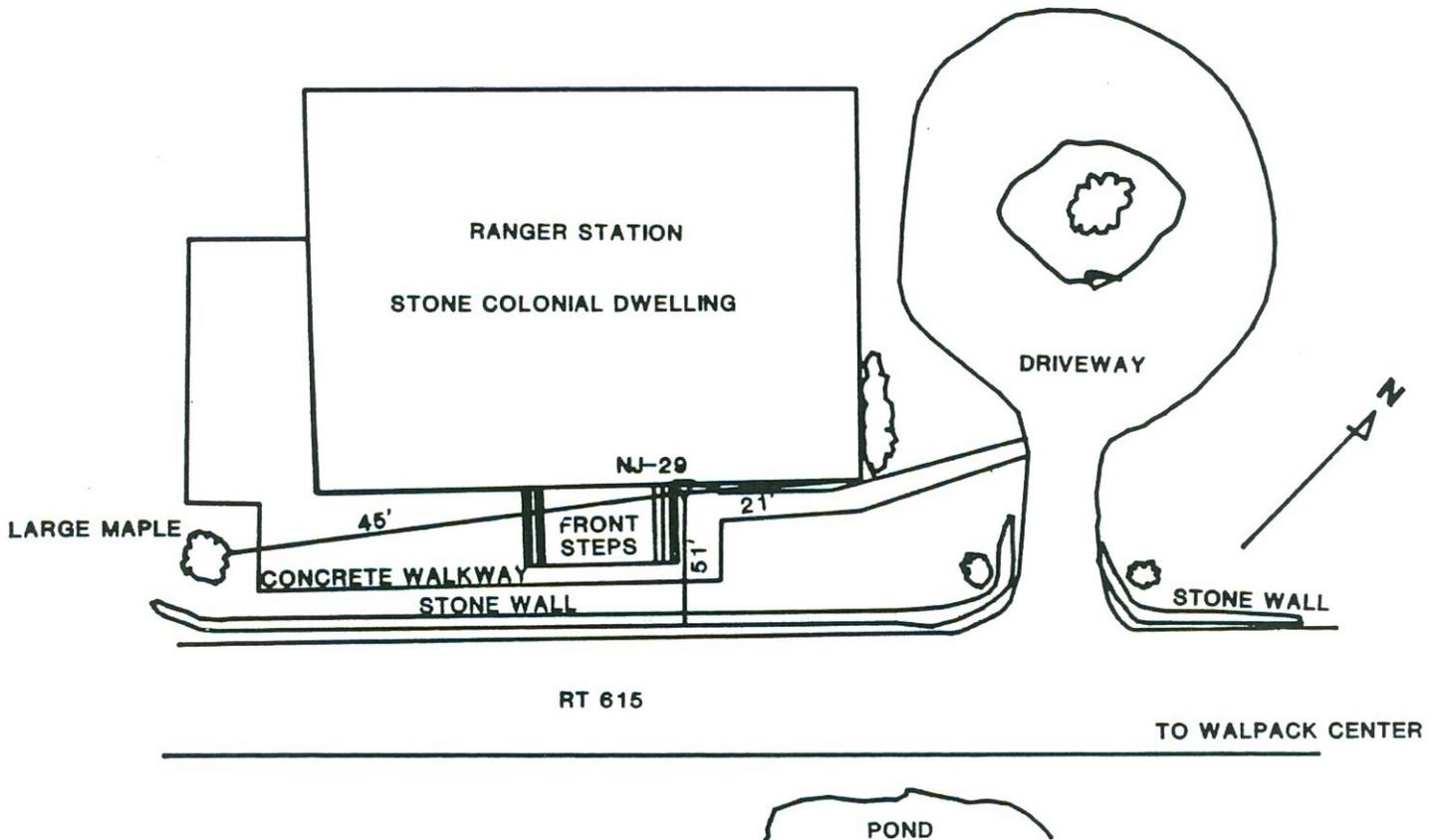
LATITUDE DEGREES: 41 MINUTES: 9.317

LONGITUDE DEGREES: 74 MINUTES: 53.050

ELEVATION: 460.000 FEET 140.000 METERS GRAVITY: 980209.110

DESCRIPTION: STATION LOCATED AT THE CORNER OF THE FRONT STEPS AND THE FOOTPATH LEADING TO ENTRANCE AT THE RANGER STATION ON COUNTY RTE. 615. THE RANGER STATION IS ON THE NW SIDE OF THE ROAD.
NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: HUNTERDON

STATION: NJ-30

MUNICIPALITY: MILFORD BORO

BENCHMARK: NONE

USGS QUADRANGLE: FRENCHTOWN

LATITUDE DEGREES: 40 MINUTES: 34.033

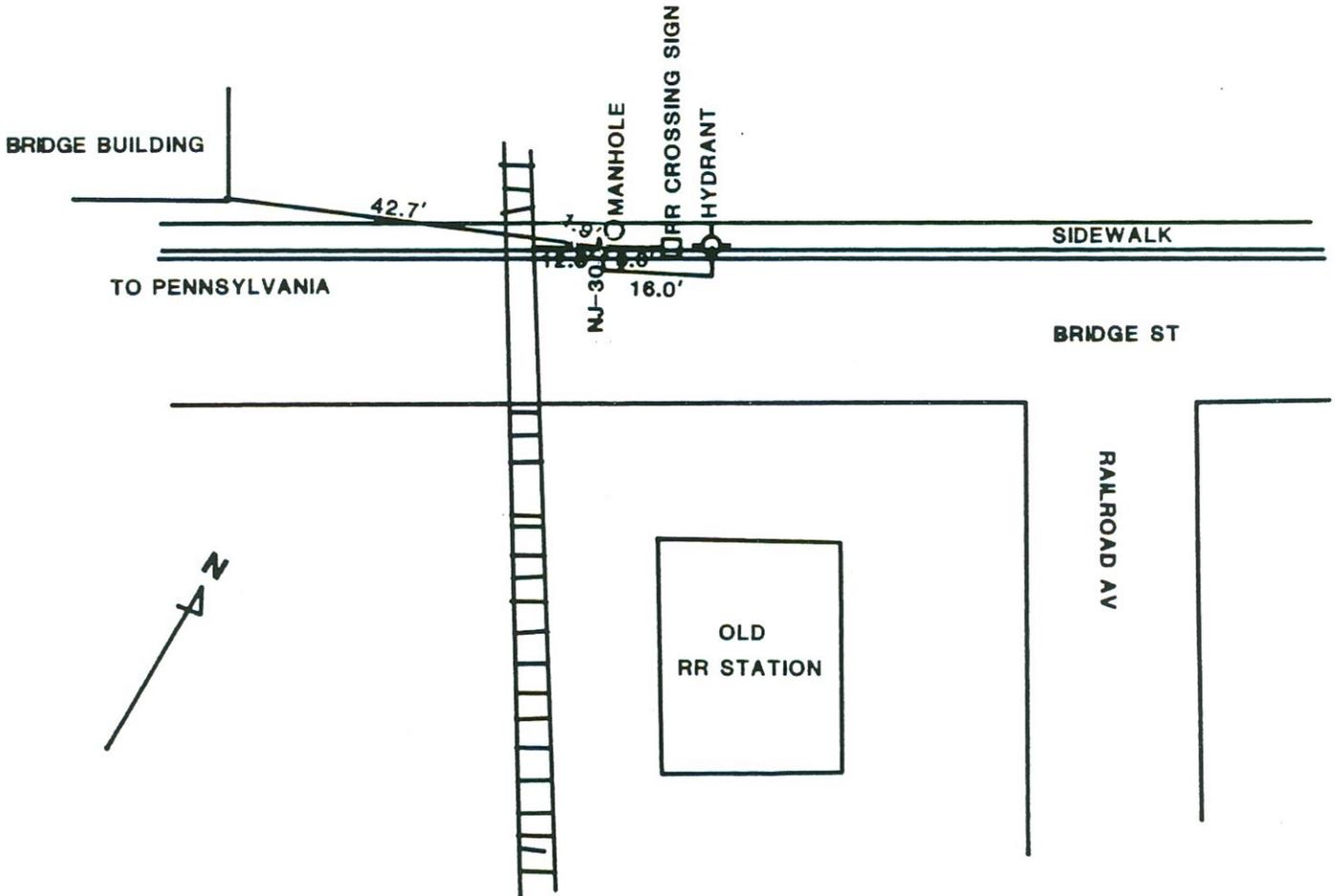
LONGITUDE DEGREES: 75 MINUTES: 5.850

ELEVATION: 139.000 FEET 42.000 METERS GRAVITY: 980173.380

DESCRIPTION: LOCATED ON BRIDGE ST. MILFORD (N.J.) ON THE NORTH SIDE OF THE ROAD ACCROSS FROM THE OLD RAILROAD STATION. MONUMENT IS A RAILROAD SPIKE IN THE CONCRETE SIDEWALK ABOUT 1 FOOT FROM CURB. FOUND BETWEEN RR TRACK AND RR CROSSING SIGN, NEXT TO SEWER CAP.

NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: WARREN

STATION: NJ-31

MUNICIPALITY: HACKETTSTOWN TOWN

BENCHMARK: NONE

USGS QUADRANGLE: TRANQUILITY

LATITUDE DEGREES: 40 MINUTES: 52.500

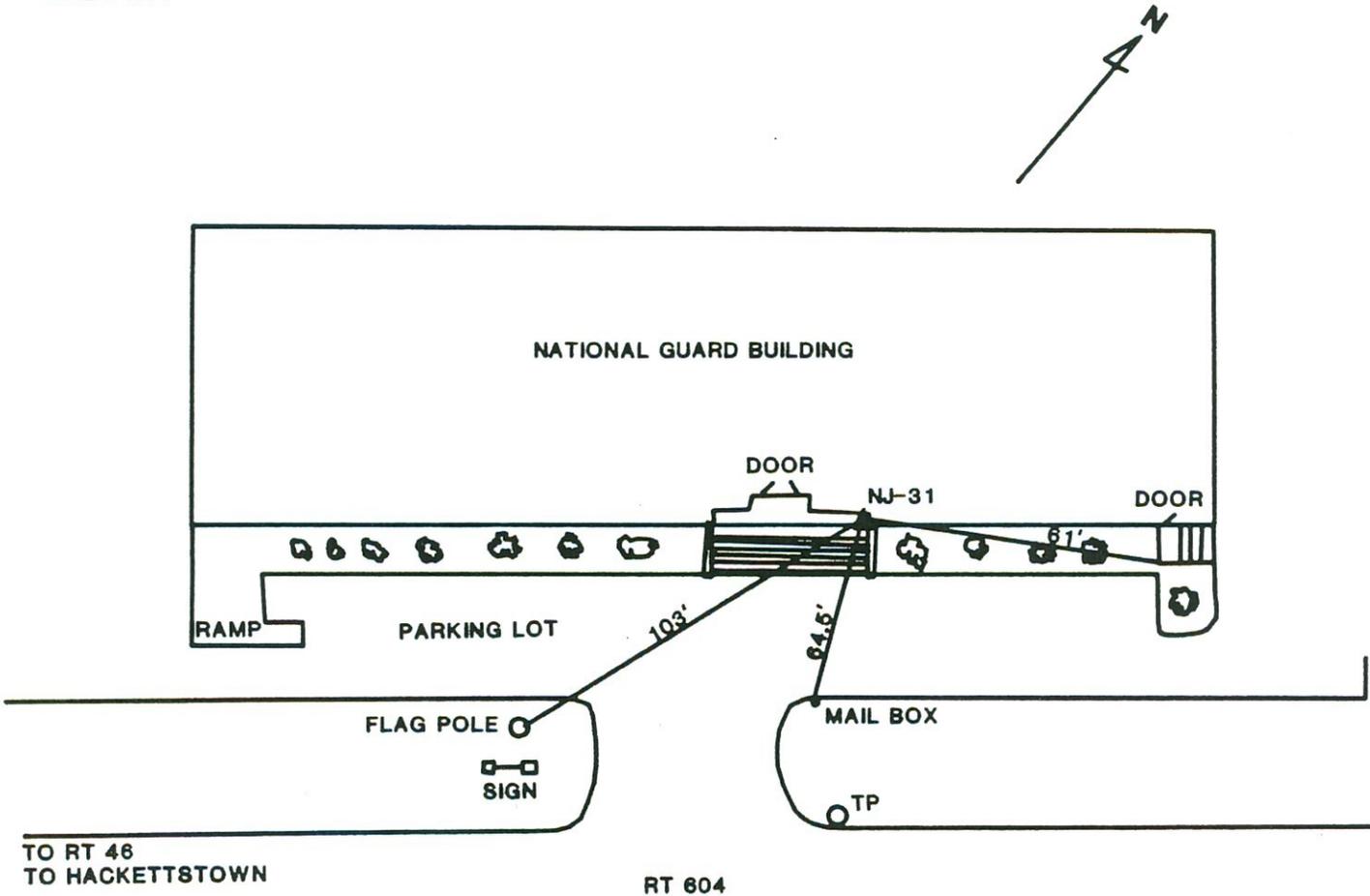
LONGITUDE DEGREES: 74 MINUTES: 48.550

ELEVATION: 643.000 FEET 196.000 METERS GRAVITY: 980182.240

DESCRIPTION: STATION LOCATED AT THE NATIONAL GUARD ARMORY ON WARREN CO. RTE. 604, 1.8 MILES EAST OF U.S. RTE. 46. READING TAKEN ON THE TOP OF THE STEPS TO THE MAIN ENTRANCE, ON THE RIGHT HAND SIDE, IN THE CORNER OF THE WALL NEXT TO A DRAIN PIPE.

NOTE: ELEVATION ESTIMATED FROM A USGS 7.5' QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MIDDLESEX

STATION: NJ-32

MUNICIPALITY: EAST BRUNSWICK TWP.

BENCHMARK: MON. 3146

USGS QUADRANGLE: NEW BRUNSWICK

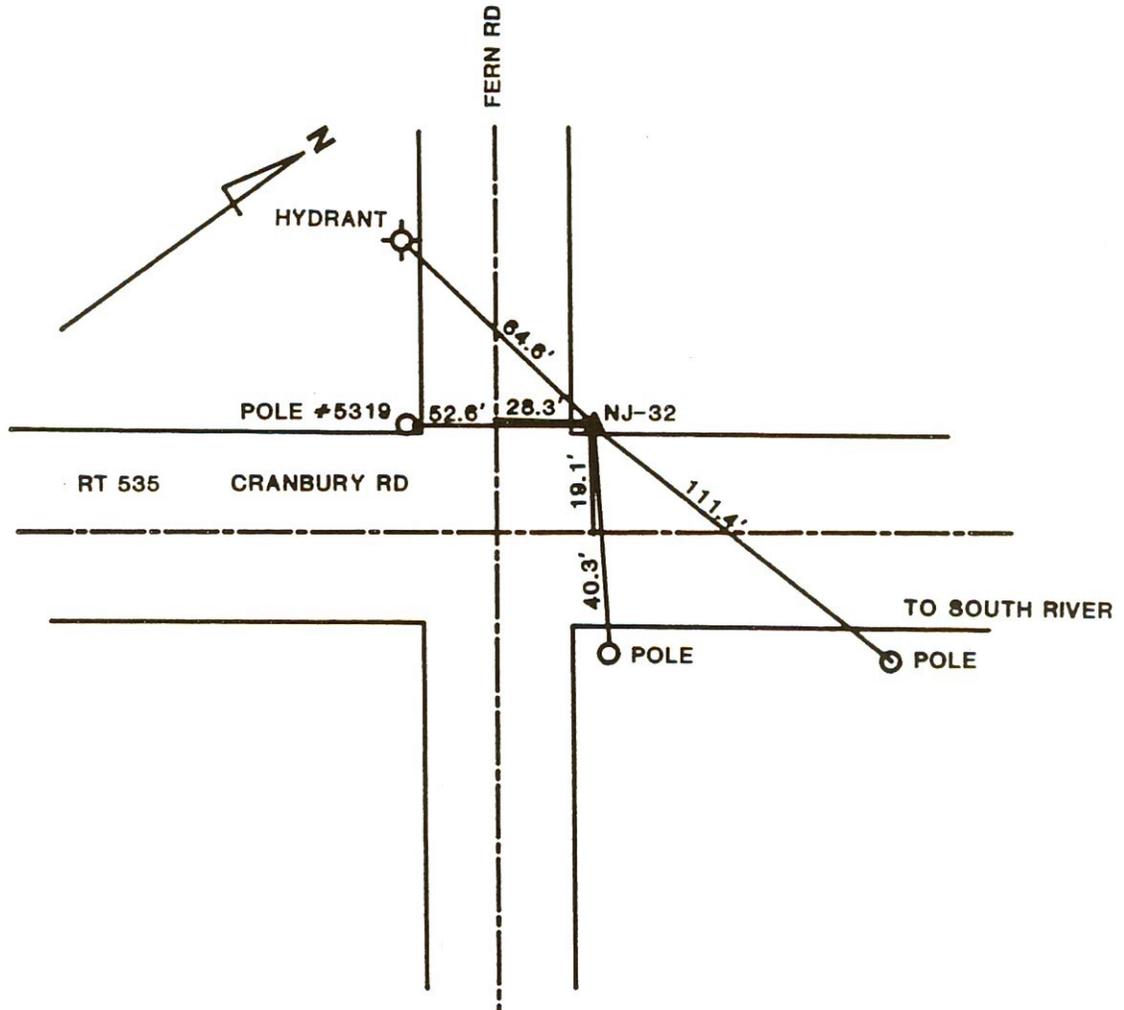
LATITUDE DEGREES: 40 MINUTES: 24.273

LONGITUDE DEGREES: 74 MINUTES: 25.516

ELEVATION: 124.261 FEET 37.900 METERS GRAVITY: 980208.380

DESCRIPTION: MONUMENT IN THE NORTH CORNER OF THE INTERSECTION OF RTE. 535 (CRANBURY RD.) AND FERN RD. LOCATED 3.1 MILES SOUTHWEST OF THE INTERSECTION OF SOUTH RIVER-HIGHTSTOWN RD. AND STATE RTE. 18.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MIDDLESEX

STATION: NJ-33

MUNICIPALITY: EDISON TWP.

BENCHMARK: MON. 12185

USGS QUADRANGLE: PERTH AMBOY

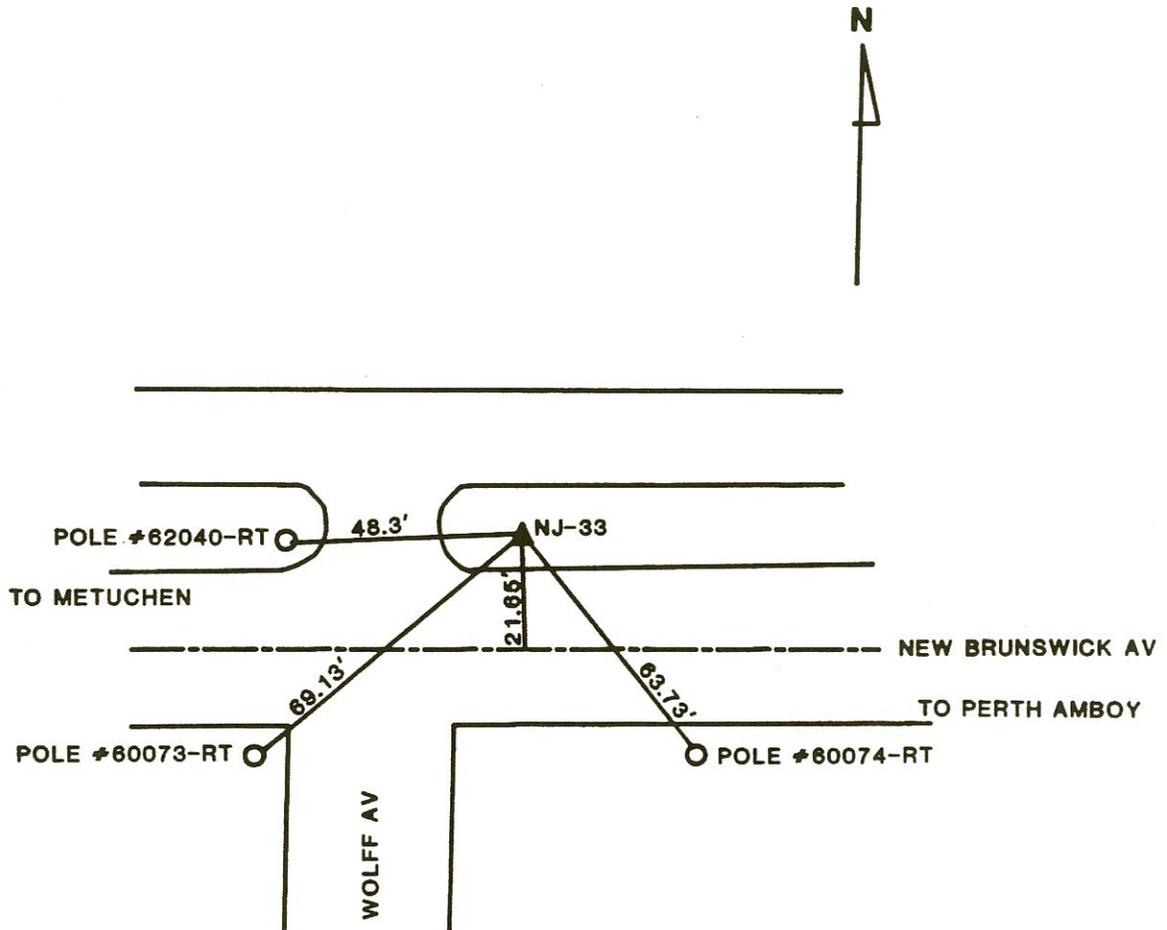
LATITUDE DEGREES: 40 MINUTES: 31.805

LONGITUDE DEGREES: 74 MINUTES: 19.303

ELEVATION: 111.698 FEET 34.040 METERS GRAVITY: 980220.640

DESCRIPTION: MONUMENT IS 63.73 FEET NORTHEAST OF POLE #60074-R.T., 21.65 FEET NORTH OF CENTERLINE OF NEW BRUNSWICK AVE., 69.13 FEET NORTHEAST OF POLE #600 73-R.T., 48.30 FEET EAST OF POLE #620 40-R.T.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MERCER

STATION: PRINCETON

MUNICIPALITY: PRINCETON BORO

BENCHMARK: NONE

USGS QUADRANGLE: PRINCETON

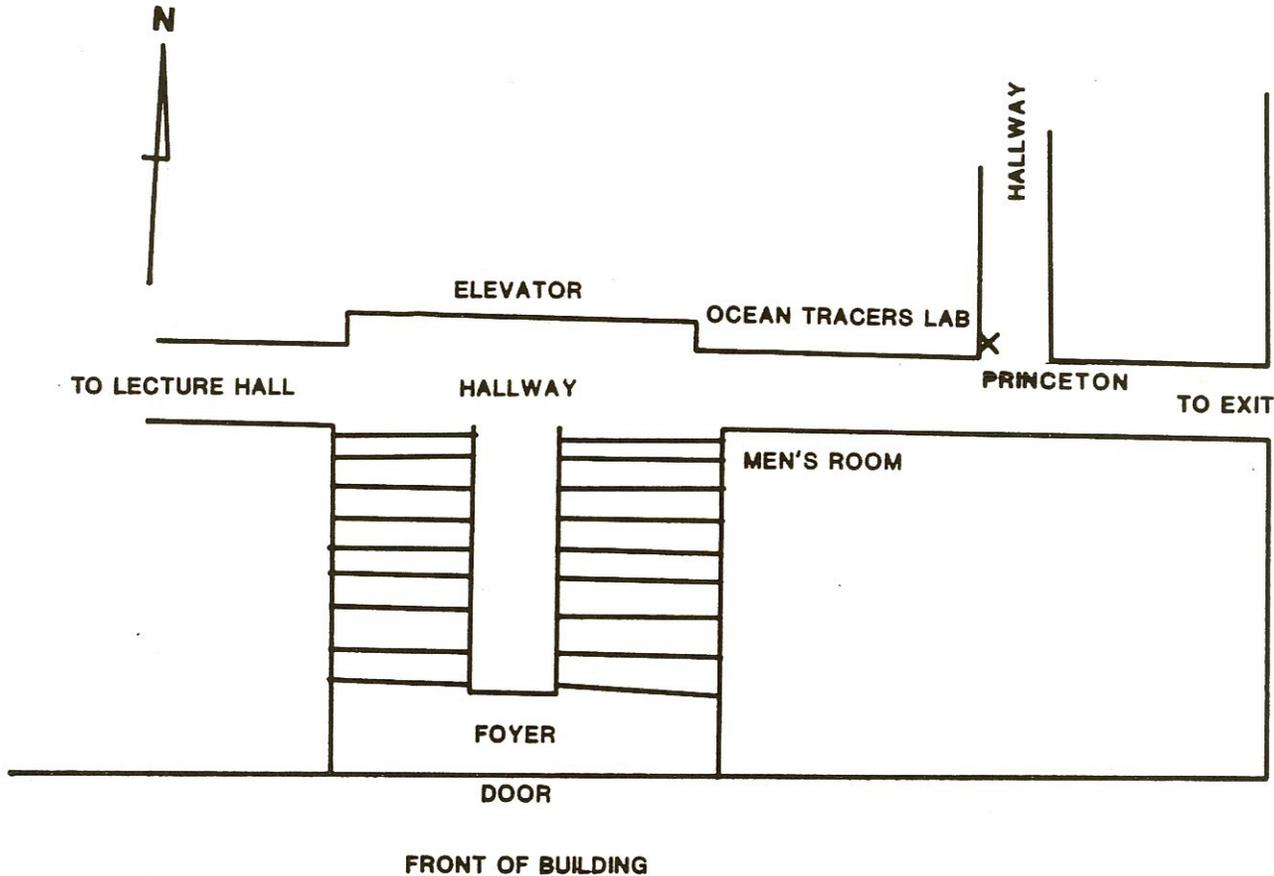
LATITUDE DEGREES: 40 MINUTES: 20.750

LONGITUDE DEGREES: 74 MINUTES: 39.007

ELEVATION: 150.000 FEET 45.720 METERS GRAVITY: 980177.600

DESCRIPTION: BASEMENT OF GUYOT HALL AT PRINCETON UNIVERSITY IN THE EASTERN END OF THE HALLWAY PARALLEL TO THE FRONT OF THE BUILDING. MARKED BY A PENNY GLUED TO THE FLOOR WHICH HAS BEEN PAINTED OVER. ESTABLISHED BY BONINI AND WOOLLARD (1957)
NOTE: ELEVATION ESTIMATED FROM 7.5' USGS QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MIDDLESEX

STATION: RUTGERS

MUNICIPALITY: PISCATAWAY TWP.

BENCHMARK: NONE

USGS QUADRANGLE: PLAINFIELD

LATITUDE DEGREES: 40 MINUTES: 29.880

LONGITUDE DEGREES: 74 MINUTES: 26.820

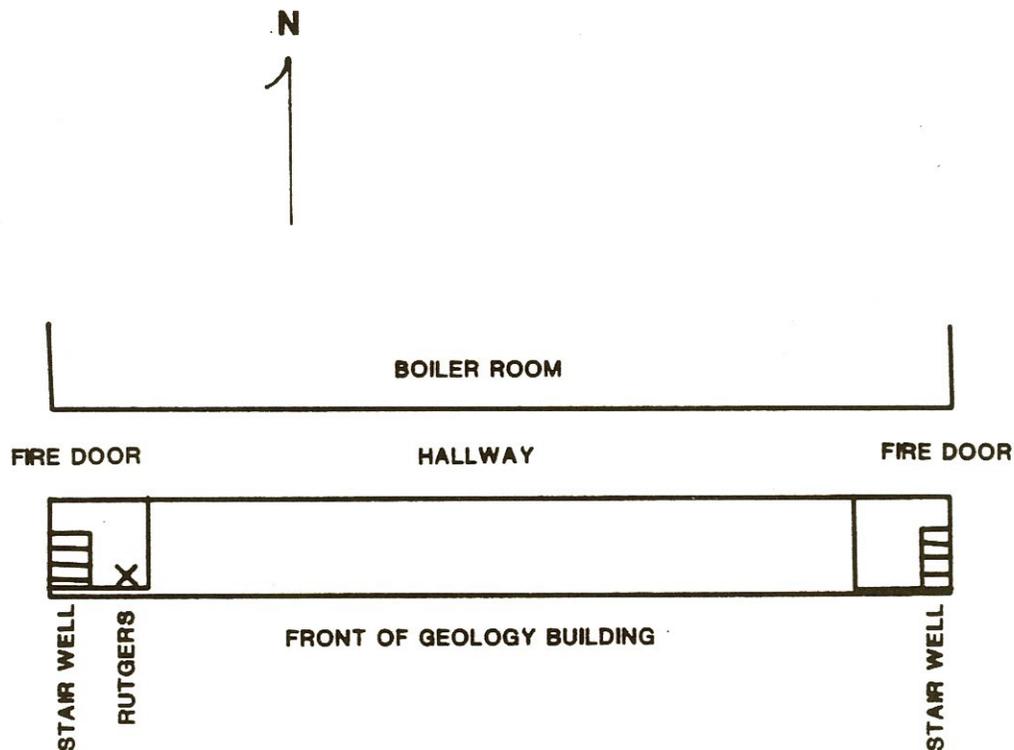
ELEVATION: 105.000 FEET 32.000 METERS GRAVITY: 980209.810

DESCRIPTION: FOUND AT THE BOTTOM OF THE STAIR WELL IN THE GEOLOGY BUILDING AT BUSCH CAMPUS IN PISCATAWAY. LOCATION IS MARKED BY AN "X" CHIPPED INTO THE CONCRETE.

ESTABLISHED BY YERSAK (1977).

NOTE: ELEVATION ESTIMATED FROM A 7.5' USGS QUADRANGLE.

SKETCH:



NEW JERSEY GRAVITY BASE NETWORK

COUNTY: MERCER

STATION: RIDER

MUNICIPALITY: LAWRENCE TWP.

BENCHMARK: NONE

USGS QUADRANGLE: PRINCETON

LATITUDE DEGREES: 40 MINUTES: 20.750

LONGITUDE DEGREES: 74 MINUTES: 44.283

ELEVATION: 110.000 FEET 33.520 METERS GRAVITY: 980181.800

DESCRIPTION: ESTABLISHED BY DARIN KLEWSAAT (1988, WRITTEN COMMUNICATION). FOUND ON THE FIRST FLOOR OF SCIENCE HALL AT THE EAST END OF THE HALLWAY. LOCATED UNDER THE WATER FOUNTAIN BETWEEN THE RESTROOMS. PLAQUE ON THE WALL INDICATES THE OBSERVED GRAVITY.
 NOTE: ELEVATION ESTIMATED FROM A 7.5' USGS QUADRANGLE.

SKETCH:

