Appendix I

Noise Impact Assessment

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FISHERS RIDGE
OVER & ABOVE

TOWN OF VICTOR, NEW YORK
SOUND IMPACT ASSESSMENT
March 2013

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Sound Impact Assessment

1. Executive Summary - This report presents the results of a sound analysis for the proposed Fishers Ridge development that would be located in the Town of Victor, New York in Ontario County. The proposed project site is bound by the New York State Thruway to the north, and is located along NYS Route 96 between Rowley Road and Lane Road as shown in Figure 1. The analysis gives specific attention to potential sound emissions generated by the proposed development to the residential properties around the perimeter of the proposed project, and specifically along Rowley Road, and Lane Road.

The purpose of the study is: to provide an analysis of sound levels produced by the activity and operation of the proposed development; evaluate the project-related sound levels with respect to a performance standard; and to minimize noise impacts (if identified).

The analysis presents the following:

- Recorded ambient sound levels at residential locations adjacent to the project area on January 16th, 2013;
- Noise emission characteristics and sound levels at adjacent residential locations;
- Identifying locations where the proposed development project may cause a noise impact to existing sound receptors (residential properties)

Noise contour graphics of the proposed development and bordering residential properties are provided in Attachment A. The dominant potential project-related exterior noise sources would include: site vehicle movements (including delivery trucks), parking lot activity, and building mechanical equipment (rooftop air-handling units, and air-conditioners). In addition, parking sweeper activity and garbage / refuse collection were included during the morning period. The sound analysis uses the full build-out traffic volumes (based on the project traffic impact study), and conservatively assumes that all of the building equipment emission sources are operating simultaneously.

The sound analysis findings at the bordering residential properties indicate that sound levels may increase as a result of the proposed development. However, any predicted sound level increases between the No Build condition and the Build condition are a maximum 3 dB(A), and according to the NYSDEC program policy related to assessing noise impacts states that increases ranging from 0 to 3 dB(A) should have no appreciable effect on receptors. The performance standard for this project would not allow future Build condition sound levels to increase by more than 3 dB(A) above future No Build conditions at any of the measurement locations, and mitigation measures would be incorporated as needed in the future to meet this standard. Achieving low noise level increases would be accomplished by features of the current development plan, such as placing buildings as far away as feasible from the residences, and by utilizing ground topography, which would block the direct line of sight between the traffic and parking lot activity sources and the residential receptors.

2. Noise Descriptors - Noise is often described as unwanted sound. Sound is defined as pressure vibrations in air that are detected by human hearing. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, or Hertz (Hz), and the human ear is capable of noticing frequencies in the approximate range of 20 to 20,000 Hz.

Intensity is a measure of the magnitude or energy of the sound, and is directly related to pressure level. Pressure levels are expressed in terms of a logarithmic scale with units called decibels (dB). As the intensity of a noise increases, it is judged to be more annoying.

Frequency as described above is a measure of the tonal qualities of sound. The spectrum of frequencies provides the identity of a sound. People are most sensitive to sounds in the middle to high frequencies, therefore higher frequencies tend to cause more annoyance. This sensitivity led to the use of the A-weighted sound level, which provides a single number measure that weighs different frequencies of the frequency spectrum in a manner similar to the sensitivity of the human ear. Thus, the A-weighted sound level in decibels dB(A) provides a simple measure of intensity and frequency that correlates well with the human response to environmental noise. Typical sound levels are provided in Table 2.1.

TABLE 2.1
TYPICAL SOUND LEVELS

Rock Concert at Stage	110 dB(A)	*Intolerable*
Shout (5 feet)	100 dB(A)	*Very Noisy*
Heavy truck a highway speed (50 feet)	90 dB(A)	
Urban Street	80 dB(A)	*Noisy*
Automobile interior (high speed)	70 dB(A)	
Normal conversation	60 dB(A)	*Moderate*
Typical outdoor suburban neighborhood	50 dB(A)	
Livingroom	40 dB(A)	*Quiet*
Bedroom at night	30 dB(A)	
Broadcast studio	20 dB(A)	
Distant rustling leaves	10 dB(A)	*Barely audible*
	0 dB(A)	

Community noise is commonly described in terms of the “ambient” noise level (or the sound level at a given location, normally specified as a reference level to study potential new sound sources). Since community noise is rarely constant with time, it is necessary to use a method of measure that will account for the time-varying nature of sound when studying the noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent sound level (L_{eq}), which is the continuous steady sound level that would have the same total A-weighted sound energy as the real fluctuating sound measured over the same period of time (usually one hour). The L_{eq} descriptor (in dB(A)) is generally the foundation for noise level analysis, and has been chosen for use in this study.

3. Noise Standards - The Victor Town Code does not currently quantify the acceptable increase in sound pressure levels created by a proposed development, therefore, the threshold for significant sound pressure level increase is based upon the Impact Assessment section of the NYSDEC report entitled *Assessing and Mitigating Noise Impacts*. In non-industrial settings (i.e. residential land use) a significant intrusive sound pressure level increase (or noise impact) is considered to occur when an increase by 5 dB(A) or greater is experienced at the evaluated receptor. The level of human reaction to sound level increases as provided in the NYSDEC report is summarized in Table 3.1.

TABLE 3.1
HUMAN REACTION TO INCREASES IN SOUND PRESSURE LEVEL

Increase In Sound Pressure (dB(A))	Human Reaction
Under 5	Unnoticed to tolerable
5-10	Intrusive
10-15	Very noticeable
15-20	Objectionable
Over 20	Very objectionable to intolerable

Even though the NYSDEC guideline has established that a 5 dB(A) or greater sound level increase as being intrusive (or an impact), the performance standard for this project would not allow future Build condition sound levels to increase by more than 3 dB(A) above future No Build conditions at any of the measurement locations and mitigation measures would be incorporated as needed in the future to meet this standard.

4. Existing Ambient Noise Environment and Noise Prediction Model Validation - The existing ambient noise environment in the immediate study area was focused on the bordering residential properties. This included taking noise measurements near the property lines of residences on Rowley Road and Lane Road. Sample measurements were obtained on January 16th, 2013 for a 10 minute duration a daytime period between 2:30 p.m. and 4:30 p.m., and then during an evening period between 9:30 p.m. and 11:00 p.m. The measurement locations are identified in Figure 1. Noise measurement equipment included a Quest Technologies 2200 integrating-averaging sound level meter, windscreen, and QC-10 calibrator. The noise meter meets ANSI Standard S1.4-1983 for Type II noise meters. The L_{eq} sound level (sample daytime and sample evening) measurements are provided in Table 4.1. Typical sound sources identified included local vehicle pass-bys, highway traffic, and other natural ambient sources. All of these noise sources were considered as part of the existing noise environment but the dominant source was highway traffic noise from either I-90 or NYS Route 96, depending on the location of the measurements.

Figure 1 – Noise Measurement Locations

The ambient noise measurement surveys were found to have sound levels consistent with typical land uses in suburban settings within the vicinity of state highways. Additionally, it was noticed that the daytime and nighttime levels varied based on the location of the measurement with respect to I-90 and NYS Route 96. The lower sound levels during the evening hours closer

to NYS Route 96 were observed to be due to significantly reduced highway traffic volumes. However, the lower levels during the evening hours closer to I-90 did not vary much from the daytime levels (between 2 and 4 dB(A)) because even though there was a reduction in overall traffic volume, there was an increase in the traffic percentage of heavy trucks during the evening hours.

TABLE 4.1
NOISE MONITORING RESULTS

Site	Location	Date	Time	Measured L_{eq} (dBA)	CadnaA Predicted L_{eq} (dBA)	Difference (dBA)
M1	Rowley Road	1/16/13	2:50pm	58	58	0
M1	Rowley Road	1/16/13	9:45pm	50	50	0
M2	Lane Road #1	1/16/13	4:10pm	53	53	0
M2	Lane Road #1	1/16/13	10:55pm	45	46	1
M3	Lane Road #2	1/16/13	3:45pm	50	51	1
M3	Lane Road #2	1/16/13	10:35pm	44	44	0
M4	Lane Road #3	1/16/13	3:30pm	52	53	1
M4	Lane Road #3	1/16/13	10:20pm	47	47	0
M5	Lane Road #4	1/16/13	3:15pm	55	55	0
M5	Lane Road #4	1/16/13	10:05pm	58	58	0

After noise measurements were taken in the field, the DataKustik CadnaA® version 4.2 software program sound propagation model (CadnaA), representing existing roadway, geometry, traffic, and site conditions, was developed using design contour mapping. Predominant land features such ground surface (grass, pavement, field, etc.) and terrain lines (to represent topographic variations) were also incorporated into the model as necessary. The CadnaA model utilizes the ISO 9613 standard for sound propagation methodology, including the major calculation factors of distance and shielding to determine the aggregate sound pressure levels in decibels. The distance factor, or direct distance from any point source location to the point of evaluation is the major factor in determining the estimated A-weighted sound pressure levels resulting from the point sources. Essentially, there is a 6 dB attenuation (or acoustical drop off rate) per doubling of distance. This means that if a sound level of 66 dB(A) were measured at 100 feet from a sound source then the corresponding sound level at 200 feet would be 60 dB(A). Shielding, also considered in the sound modeling calculations, is when the line-of-sight between a sound source and a sound receiver is blocked (by means of a contour line), therefore resulting in additional sound attenuation (decrease in sound levels). Traffic volumes, speeds, and classifications were used as input to the CadnaA model. The resulting predicted sound level was then compared to the noise measurement level recorded in the field, and adjustments in the modeling were made to provide close correlation and an accurate representation of the site characteristics. The modeling of the roadway traffic sound emission sources (I-90, NYS Route 96, and Lane Road) was found to predict sound levels no more than 1 dB(A) different from the noise levels that were actually measured in the field, as shown in Table 4.1.

5. Future Conditions Results – Sound levels have been calculated along the bordering residences using CadnaA based on the total predicted traffic for the No Build condition, and the aggregate predicted traffic (both public roadways, and site roadways), which includes truck deliveries, and operational point source sound levels (including parking lot sweepers, and garbage / refuse collection during the morning period) for the Build condition.

The results indicate that the No Build morning / daytime sound level in the backyards of the residences along Rowley Road that border the proposed development would range between 54 and 57 dB(A), and the evening sound levels would range between 45 dB(A) and 47 dB(A). At these same locations the Build morning /daytime levels would be 54 dB(A) to 57 dB(A), and the evening levels would be 45 dB(A) to 47 dB(A). The No Build morning / daytime sound level in the backyards of the residences along Lane Road that border the proposed development would range between 50 and 57 dB(A), and the evening sound levels would range between 46 dB(A) and 54 dB(A). At these same locations the Build morning / daytime levels would be 51 dB(A) to 57 dB(A), and the evening levels would be 48 dB(A) to 54 dB(A). See Attachment A for the morning / daytime / evening sound contour maps of each No Build condition and Build condition. See Attachment B for the morning / daytime / evening sound level output data generated by CadnaA at the approximate measurement locations.

6. Summary of Findings and Conclusions - This report has provided a sound impact assessment around the perimeter of the proposed development, which includes the bordering residential properties along Lane Road and Rowley Road. Sound levels at the bordering residential properties as a result of the proposed development are predicted to increase by a maximum 3 dB(A), which are in the range of increases from 0 to 3 dB(A) that have no appreciable effect on receptors, thus complying with the performance standard outlined in the NYSDEC *Assessing and Mitigating Noise Impacts*.

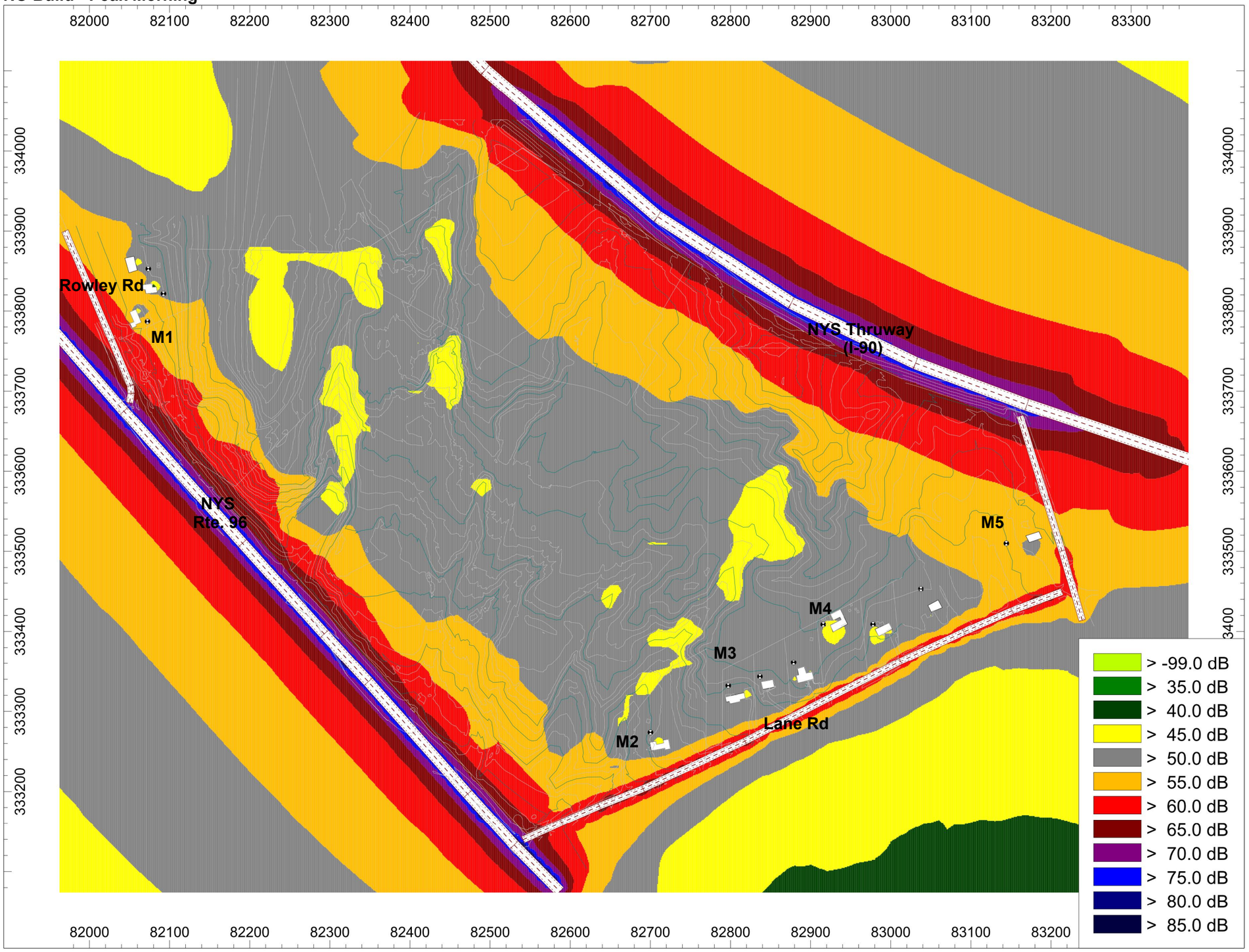
ATTACHMENT A

Sound Contour Graphics

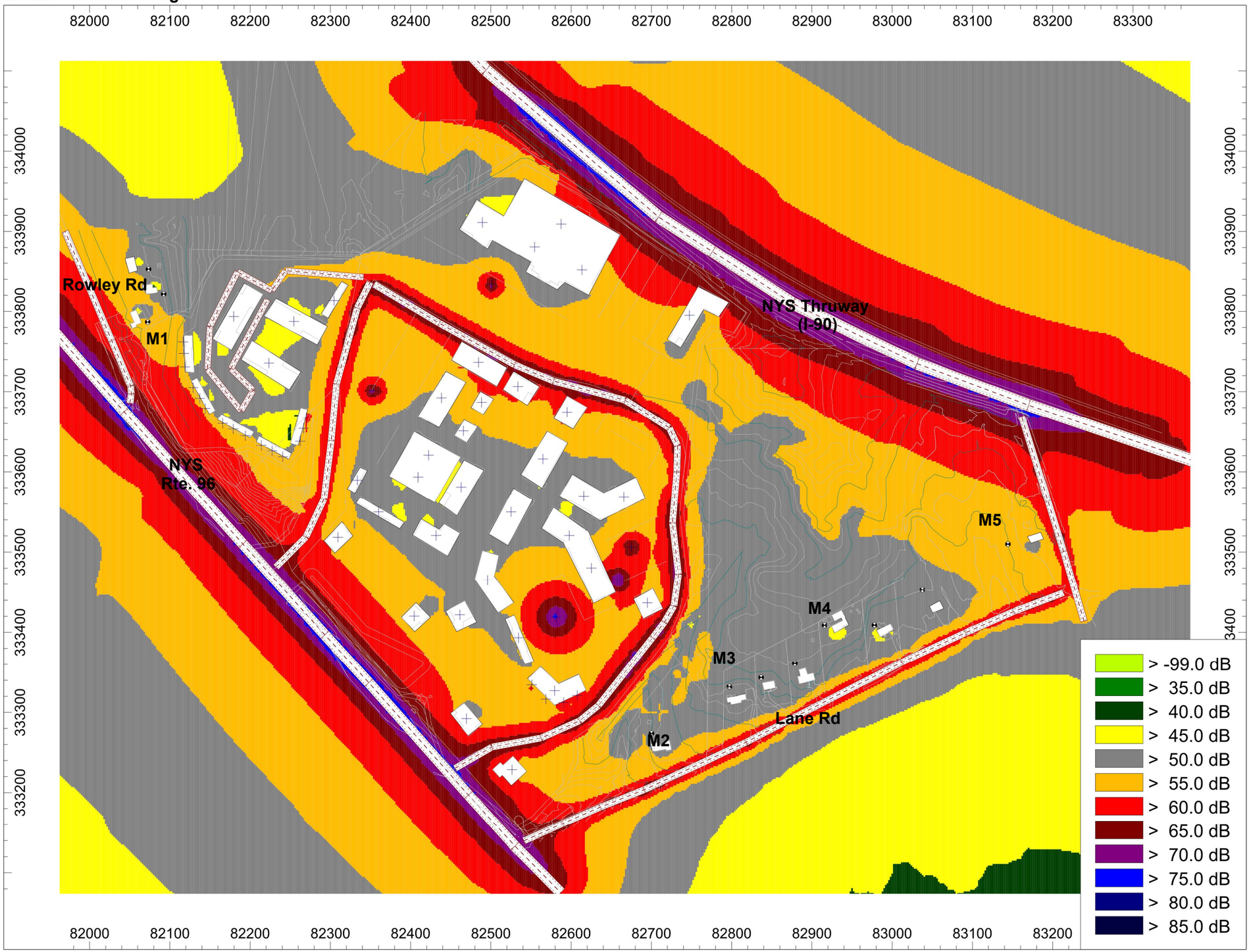
Fishers Ridge
Town of Victor
Ontario County, New York

March2013

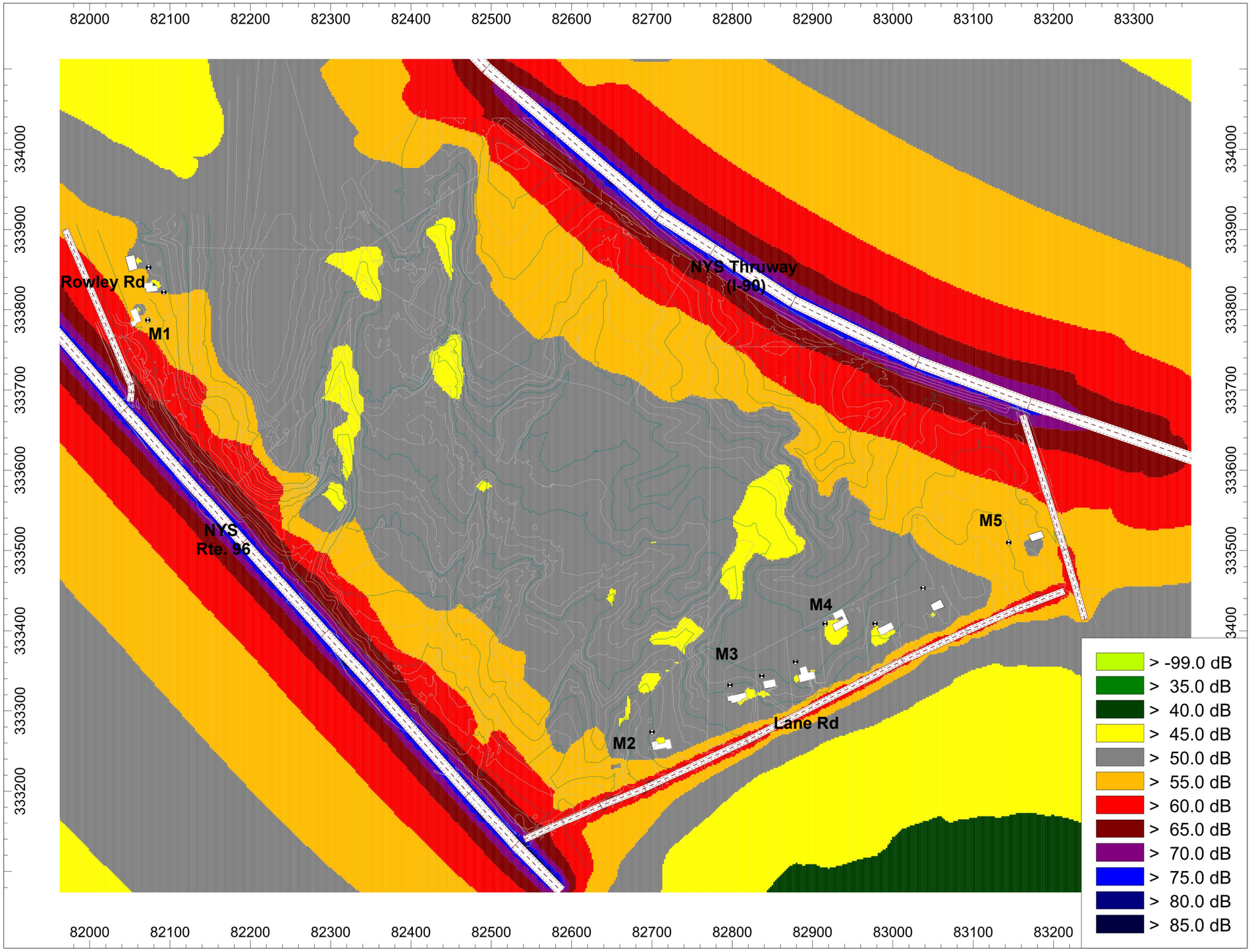
NO Build - Peak Morning



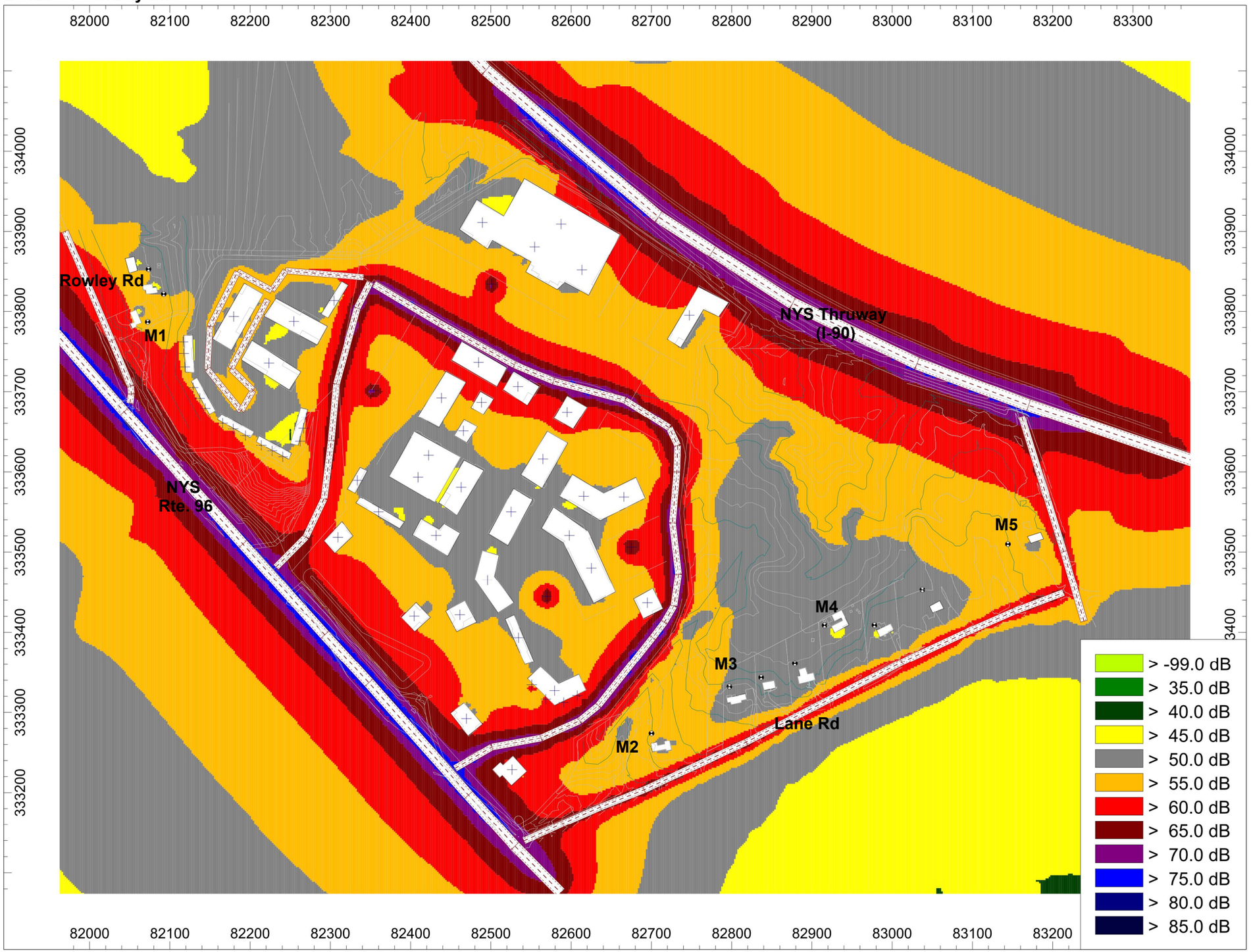
BUILD - Peak Morning



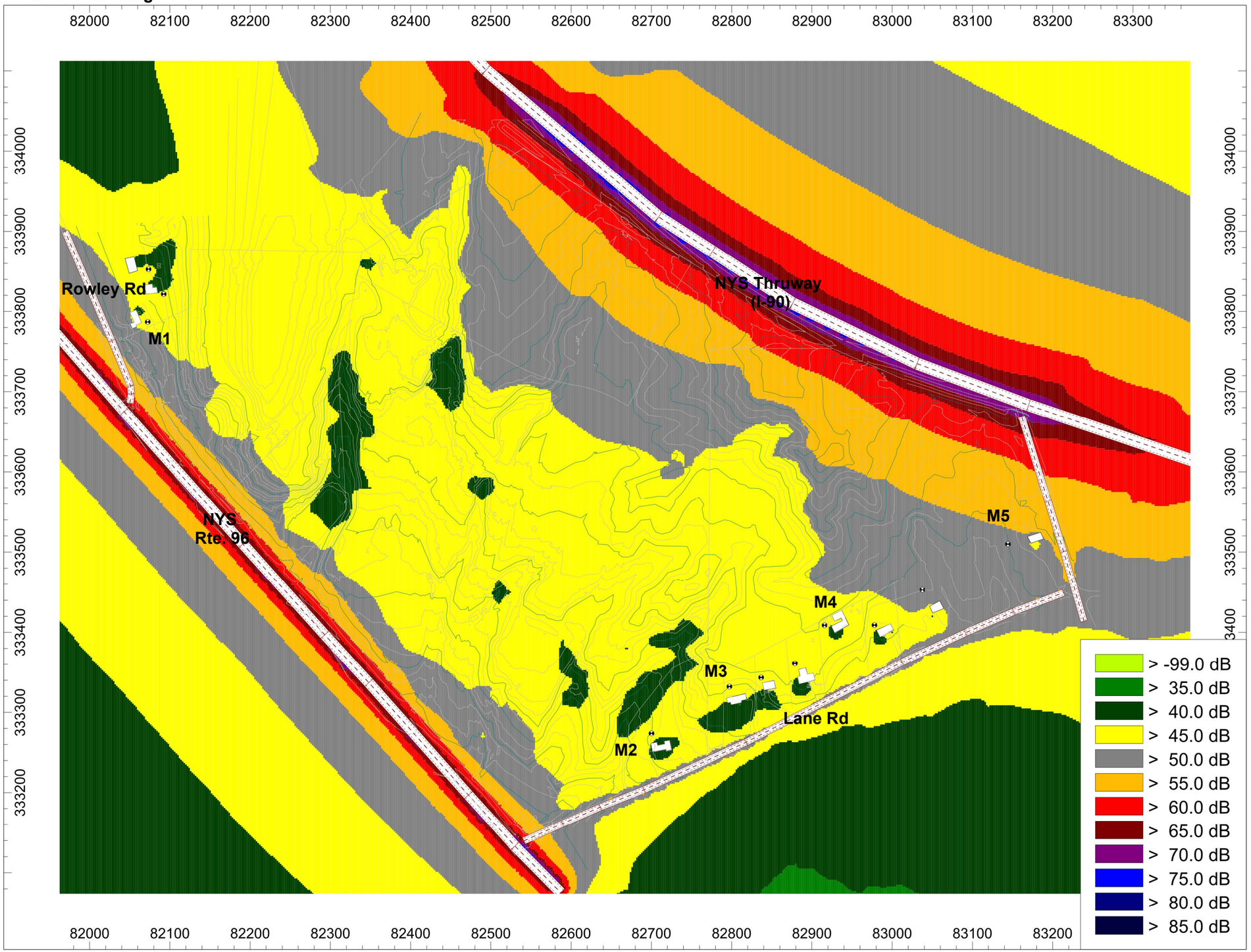
NO Build - Peak Daytime



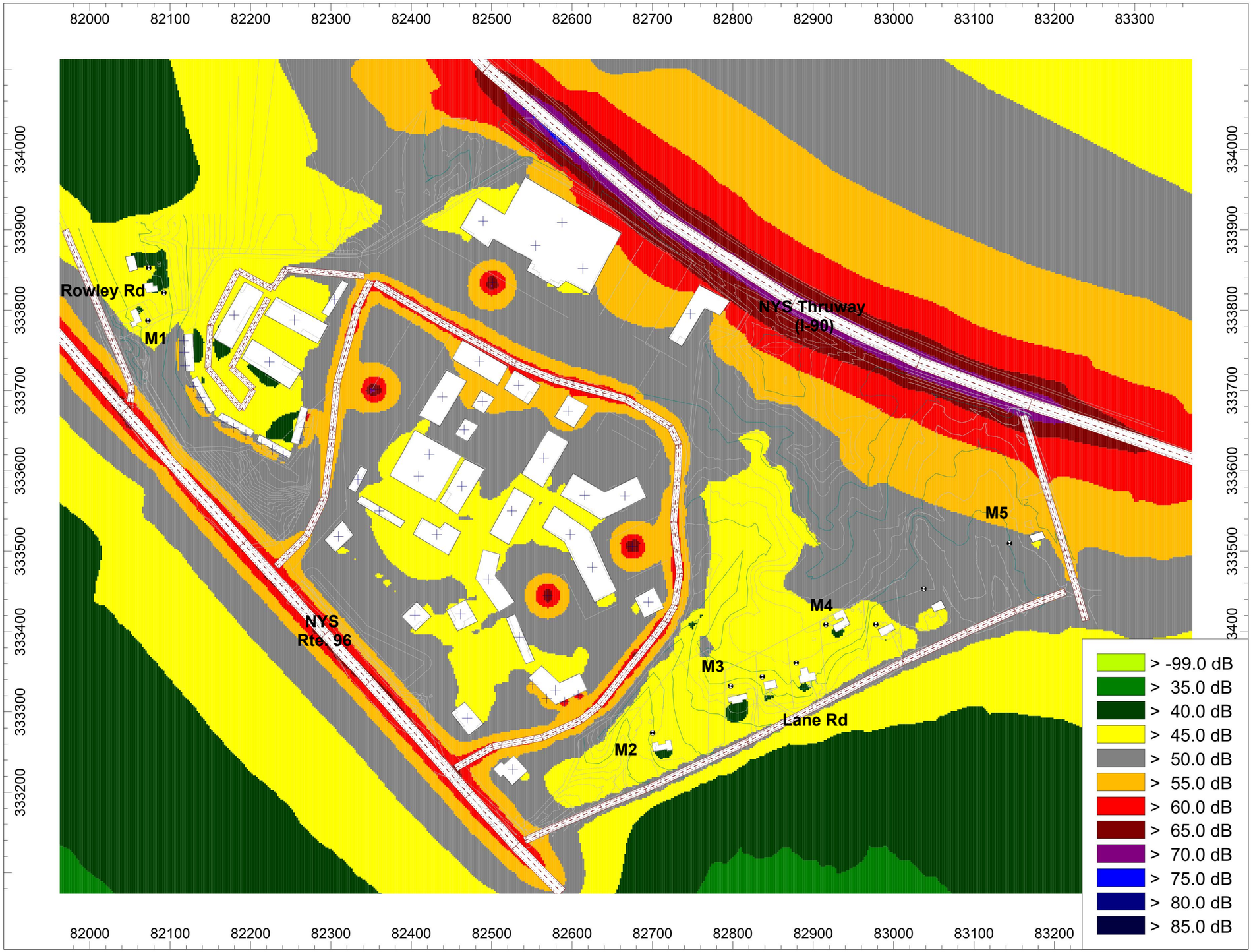
BUILD - Peak Daytime



NO Build - Evening



BUILD - Evening



ATTACHMENT B

CadnaA Sound Level Output Data

Fishers Ridge
Town of Victor
Ontario County, New York

March 2013

CadnaA Results Table

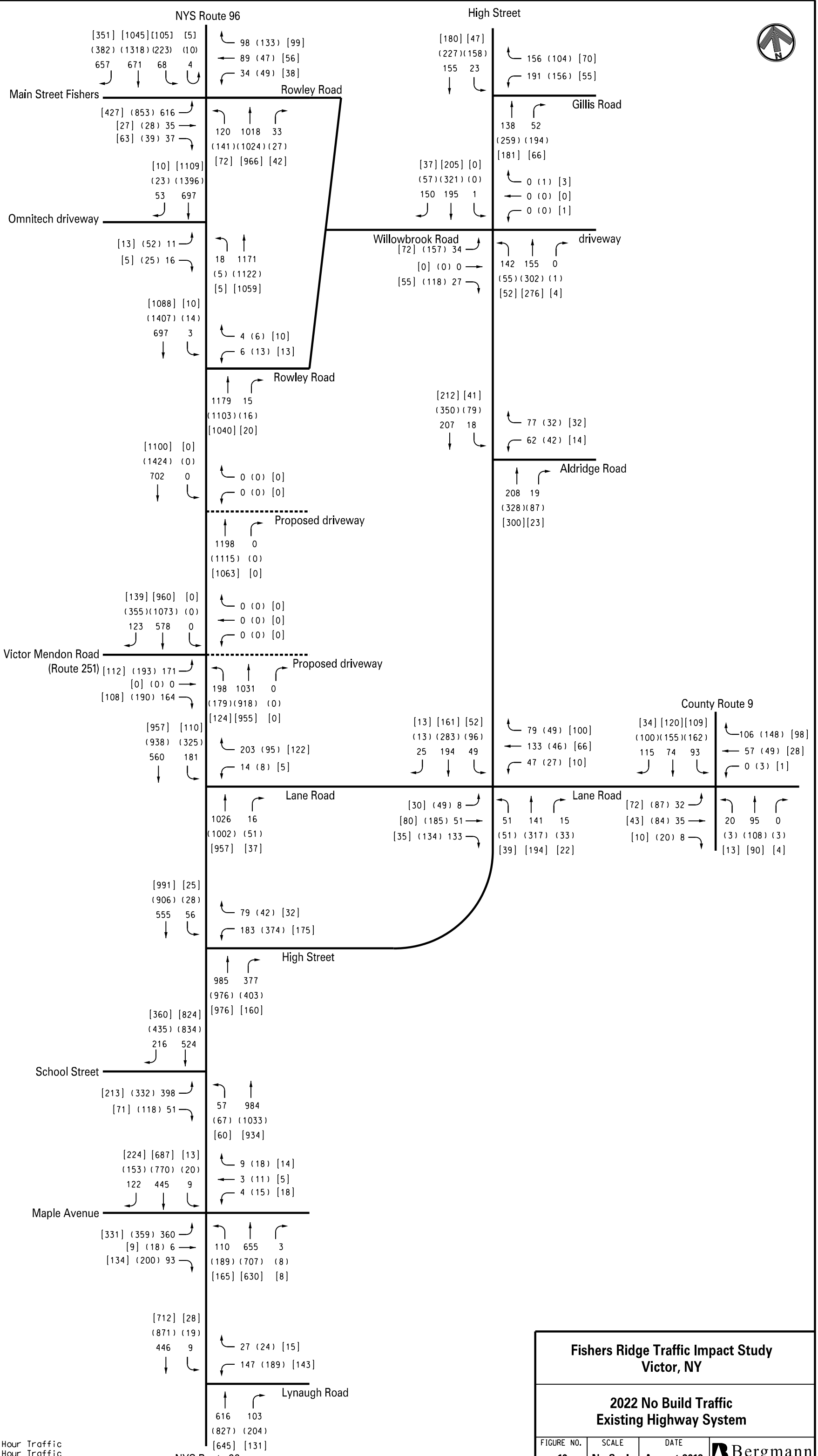
			Peak Morning Level			Peak Daytime Level			Evening Level	
Receiver			No Build	Build		No Build	Build		No Build	Build
Name	ID		dB(A)	dB(A)		dB(A)	dB(A)		dB(A)	dB(A)
Rowley Road	M1		58	58		59	60		50	50
Lane Road #1	M2		53	55		54	56		46	47
Lane Road #2	M3		52	53		52	54		47	49
Lane Road #3	M4		52	53		52	54		49	50
Lane Road #4	M5		57	57		58	58		55	55

ATTACHMENT C

Traffic Data

Fishers Ridge
Town of Victor
Ontario County, New York

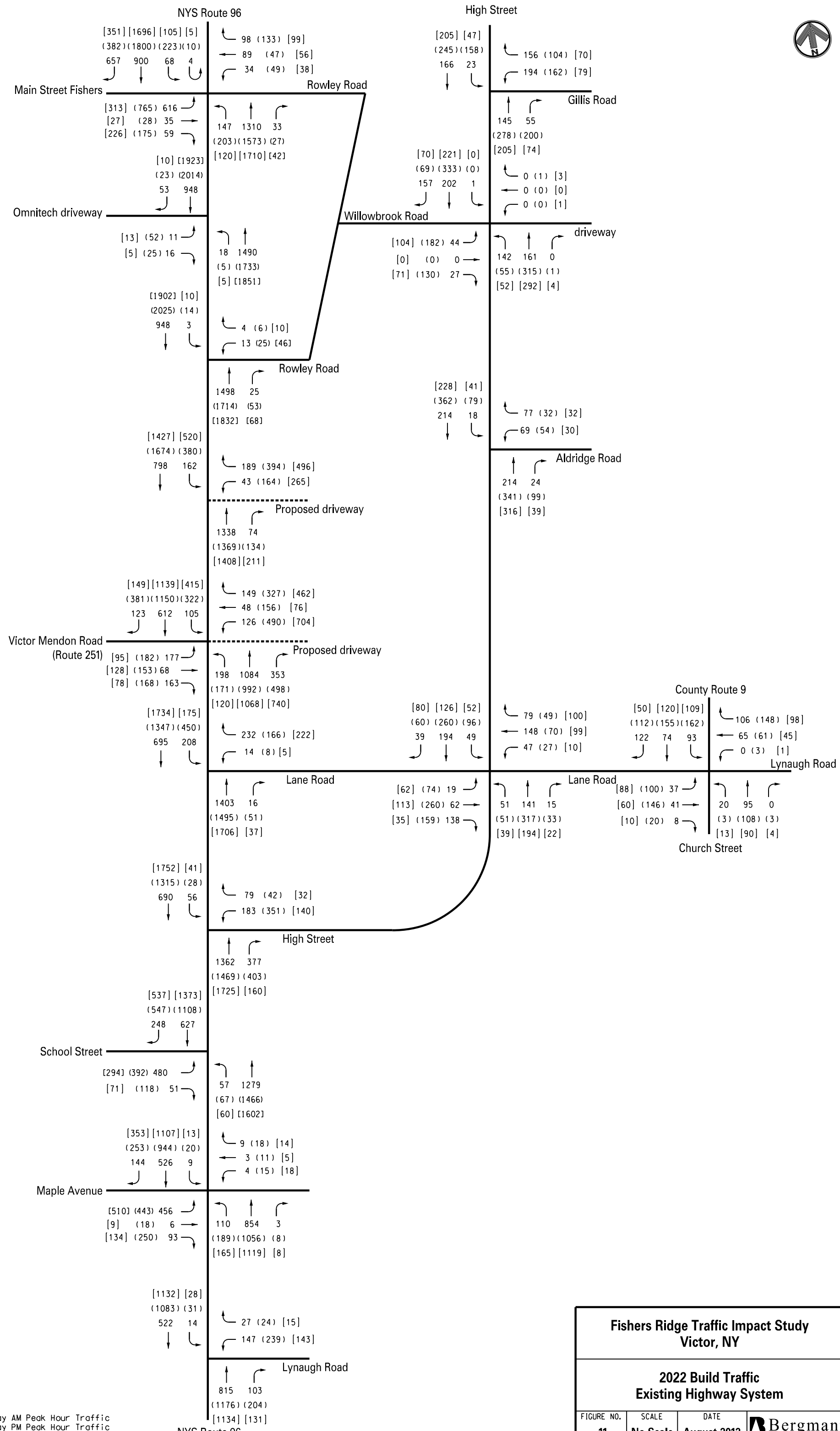
March 2013



Fishers Ridge Traffic Impact Study
Victor, NY

2022 No Build Traffic
Existing Highway System

FIGURE NO.	SCALE	DATE	
10	No Scale	August 2012	Bergmann associates



LEGEND:

XXX - Friday AM Peak Hour Traffic
(XXX) - Friday PM Peak Hour Traffic
[XXX] - Saturday Mid-day Peak Hour Traffic

Fishers Ridge Traffic Impact Study
Victor, NY

2022 Build Traffic
Existing Highway System

FIGURE NO.	SCALE	DATE	
11	No Scale	August 2012	Bergmann associates