

**PLANS AND SUPPORTING INFORMATION  
SUBMITTED AFTER THE MAY 3, 2010 ADRB  
MEETING**

**CLIFFORD BECHTEL AND ASSOCIATES**  
**PROJECT MANAGEMENT AND ENGINEERING**

May 26, 2010

Mr. Mark Sinclair  
P.O. Box 117607  
Burlingame, CA 94011

**RE: Revised Tennis Court Location for project at 3115 Ralston Avenue, Hillsborough, California**

Dear Mr. Mark Sinclair,

Per your request, I have reviewed the potential tennis court relocation as provided by your architect. I do not see any design issues with the change. My findings are as follows:

1. The shift up hill will not increase disturbed area.
2. The shift up hill will result in more fill being placed under tennis court area, thus resulting in less excess fill material for project. I have estimated there will be 200 to 250 cubic yards less off haul for project.

I hope this answers your questions about the modification you are considering. Please give me a call if you have any questions.

Sincerely,



Clifford Bechtel, P.E.  
President



## **EDWARD L. PACK ASSOCIATES, INC.**

1975 HAMILTON AVENUE  
SUITE 26  
SAN JOSE, CA 95125

*Acoustical Consultants*

TEL: 408-371-1195  
FAX: 408-371-1196  
[www.packassociates.com](http://www.packassociates.com)

June 1, 2010  
Project No. 42-019

Bart Hechtman, Esq.  
Matteoni, O'Laughlin and Hechtman  
848 The Alameda  
San Jose, CA 95126

Subject: Noise Assessment Study for the Proposed Outdoor Tennis Court,  
Horta Residence, 3115 Ralston Avenue, Hillsborough

Dear Mr. Hechtman:

This report presents the results of a noise assessment study for the proposed outdoor tennis court at the Horta Residence at 3115 Ralston Avenue in Hillsborough. The noise levels from tennis playing were evaluated against the existing ambient noise environment in the vicinity of the tennis court. The results of the analysis reveal that the hourly average ( $L_{eq}$ ) noise levels and the maximum ( $L_{max}$ ) noise levels will be below the existing ambient hourly average and hourly maximum noise levels at the neighboring properties. Although the sound of tennis playing will be audible at adjacent residences, the sound levels will not be excessive and will be similar to the sound levels generated by other tennis courts in the area. Noise mitigation measures will not be required.

Section I of this report contains a summary of our findings. Section II contain a description of the analytical methodology. Appendices A and B, attached, contain the list of references, definitions of the terminology and descriptions of the acoustical instrumentation used for the field survey.

I. **Summary of Findings**

The findings presented below were evaluated against the existing ambient noise levels in the vicinity of the Horta residence as the Town of Hillsborough Noise Ordinance does not address noise impacts or annoyance from residential tennis playing.

The existing ambient noise levels were measured at three property line locations along Ralston Avenue, along Pinehill Road and at the residence adjacent to the south. The measurements were made for 45 continuous hours from Friday afternoon to Sunday morning.

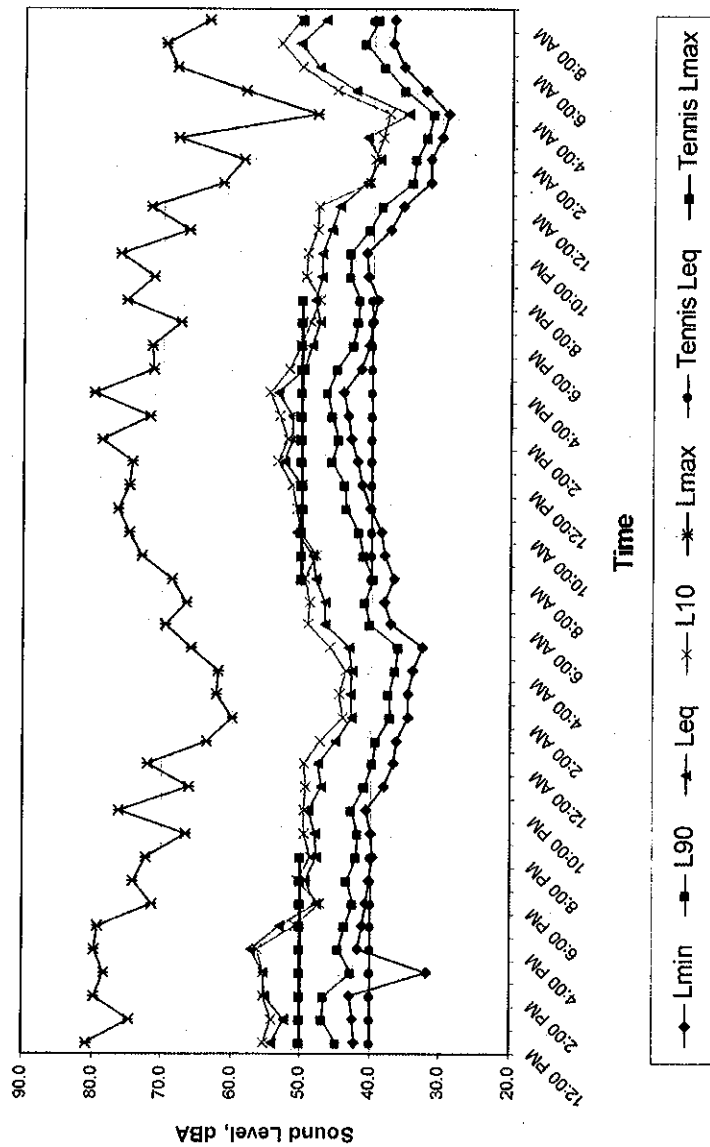
The assumptions regarding the level of tennis playing were that the players will be of professional caliber and are likely to play during the hours of 8:00 a.m. to 9:00 p.m.

The graphs on the following pages include the ambient sound data for each of the Horta property line locations and expected tennis playing noise levels at the property lines of the three nearest neighbors across Ralston Avenue, across Pinehill Road and adjacent to the south.

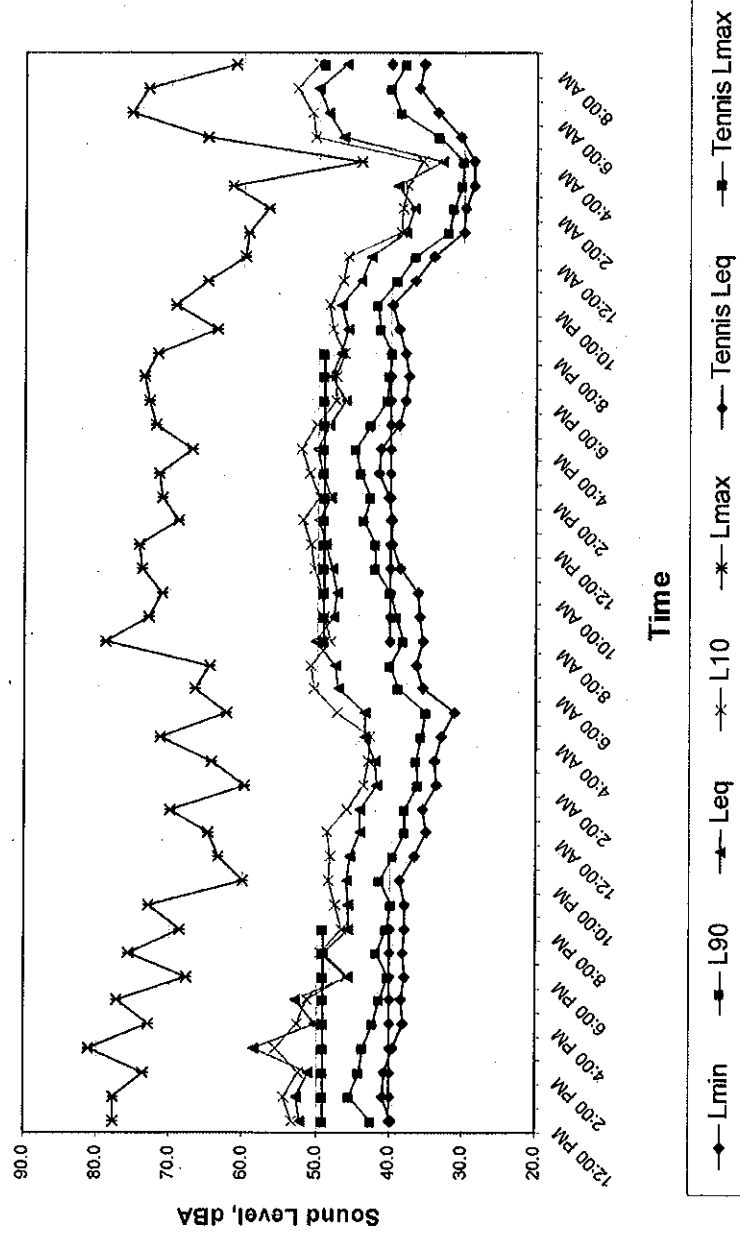
The noise data includes the  $L_{max}$  (maximum sound level measured in the hour), the  $L_{10}$  (the noise levels exceeded 10% of the time – or the “intrusive” level), the  $L_{eq}$  (also called the average noise level), the  $L_{90}$  (the noise levels exceeded 90% of the time – of the “quiet background level) and the  $L_{min}$  (minimum noise level measured in the hour). Also shown are tennis playing hourly average noise levels ( $L_{eq}$ ) and the maximum noise levels ( $L_{max}$ ).

To evaluate tennis playing against the ambient conditions, compare the black line (representing the tennis  $L_{max}$ ) to the purple line at the top of the graph (ambient  $L_{max}$ ). Also compare the red line (representing the tennis  $L_{eq}$ ) to the orange line (ambient  $L_{eq}$ ).

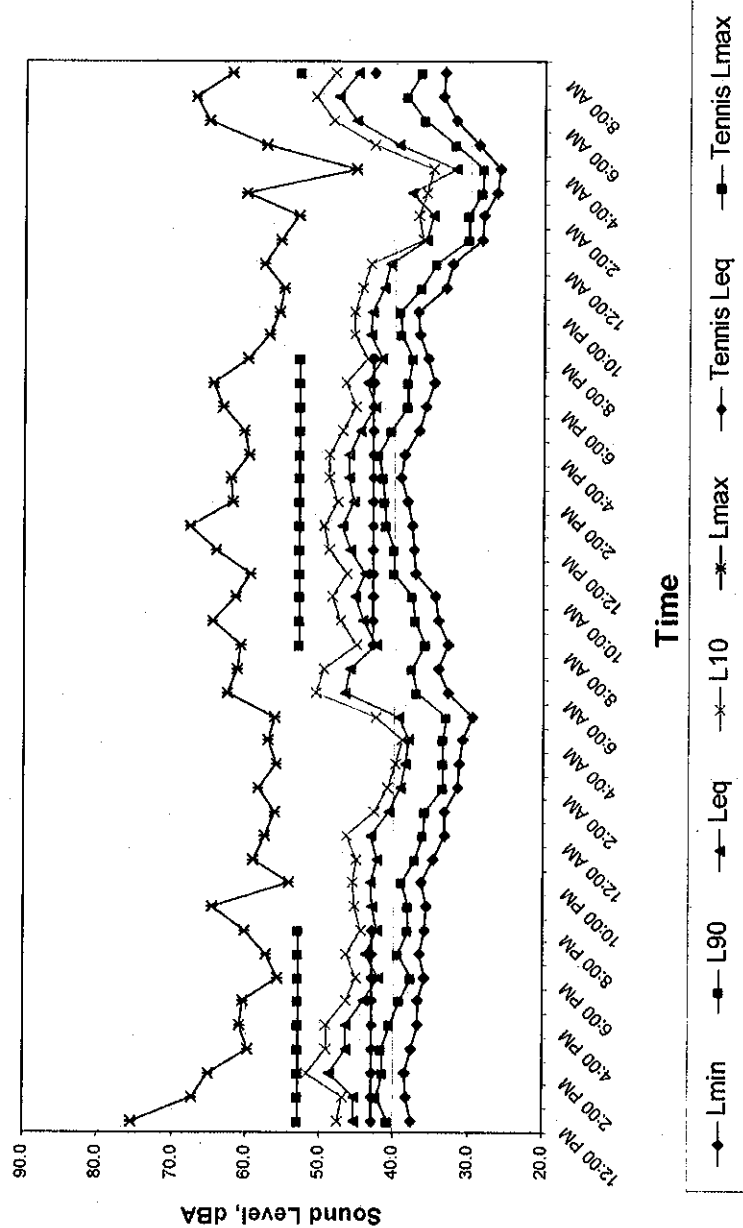
Horta Residence  
Tennis Court Noise Analysis  
Location 1 Ambient Along Ralston Avenue



Horta Residence  
Tennis Court Noise Analysis  
Location 2 Ambient Along Pinehill Road



Horta Residence  
Tennis Court Noise Analysis  
Location 3 Ambient At South Property Line



As shown above, the hourly average noise levels of tennis playing are expected below the existing ambient sound levels for the same time periods.

The maximum sound levels generated by tennis playing, which is primarily ball hits, will be below the existing ambient maximum sound levels for the same time periods.

In terms of audibility, the tennis  $L_{eq}$ 's can be compared to the existing ambient  $L_{90}$  values. At the residences along Ralston Avenue and along Pinehill Road, the tennis playing sound levels will be at or below the quiet background sound levels. Thus, tennis playing will be slightly audible at times, but will be mixed in with the background sound levels. At the residence to the south, tennis playing will be noticeable, but would not be excessive or loud.

Additional analyses were performed for the setbacks of the homes at the Ralston Avenue residence, a residence far to the south that is well downhill from the project site, the Pinehill Road residence and the residence to the south.

Table I, below, provides the tennis playing maximum and average sound levels at the property lines (to relate to the graphs above) and at the house setbacks. Note that the average noise levels include all sound from tennis playing including shoe noise, voices, ball hits and balls hitting the net. An exception is the property line of the far neighbor to the east whose precise property line location could not be determined. The neighbors to the east, both near and far, realize a topographic shielding benefit at the homes from tennis playing sources that are low to the court (below 5 ft. to 6 ft.) such a low/underhand volleys and shoe squeaks.



TABLE I			
Tennis Playing Sound Levels, dBA			
Neighbor across Ralston Avenue			
Source	Prop. Line 97 ft.	House 172 ft.	Comments
Tennis $L_{max}$	50	45	No topo shielding
Shoe Squeak $L_{max}$	44	39	
Tennis $L_{eq}$	40	35	
Neighbor to East across Pinehill Rd. (Near)			
Source	Prop. Line 110 ft.	House 195 ft.	Comments
Tennis $L_{max}$	49	45	Does not include -9 dB topo shielding for hits below 5 ft.
Shoe Squeak $L_{max}$	44	29	Inc. -11 dB topo shielding
Tennis $L_{eq}$	40	35	Does not include topo shielding
Neighbor to East (Far)			
Source	Prop. Line Unknown	House 559 ft.	Comments
Tennis $L_{max}$		35	Does not include -5 dB topo shielding for hits below 6 ft.
Shoe Squeak $L_{max}$		17	Inc. -12 dB topo shielding
Tennis $L_{eq}$		25	Does not include topo shielding
Neighbor to the South			
Source	Prop. Line 70 ft.	House 195 ft.	Comments
Tennis $L_{max}$	53	44	No topo shielding
Shoe Squeak $L_{max}$	47	38	
Tennis $L_{eq}$	43	34	

The results of this study indicate that tennis playing at the proposed tennis court at the Horta residence will be at or below the existing ambient sound levels at the neighboring homes in the vicinity.

Important Note: The neighbor across Ralston Avenue also has a tennis court that, if using the same methodology, generates sound levels of:

48 dBA  $L_{\max}$  tennis

42 dBA  $L_{\max}$  shoe squeak

38 dBA  $L_{eq}$  tennis

at their nearest neighbor's property line.

## **II. Analysis and Evaluation of the Noise Levels**

Satellite imagery of the vicinity of the Horta residence and neighbors was used to determine the proximities of the tennis court to the neighbors' property line and homes.

To determine the existing ambient noise environment in the area, continuous recordings of the sound levels were made at three locations. Location 1 was along the Horta property line along Ralston Avenue closest to the tennis court location. This location represents the ambient condition on the neighbor's side of Ralston Avenue at their property line. Location 2 was along the south property line of the Horta residence along Pinehill Road. This location also represents the noise environment at the property line of the home across Pinehill Road from the tennis court. Location 3 was along the property line of the home to the south near the house. The noise level recordings were made on May 21-23, 2010 for a continuous 45-hour period from 12:00 p.m. Friday to 9:00 a.m. Sunday. The noise levels were recorded and processed using Larson-Davis LDL 812 Precision Integrating Sound Level Meters. The meter yields, by direct readout, a series of descriptors of the sound levels versus time, as described in Appendix B. The measured descriptors include the  $L_1$ ,  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$  descriptors, i.e., those levels exceeded for 1%, 10%, 50%, and 90% of the time. Also measured were the minimum and maximum levels and the continuous equivalent-energy levels ( $L_{eq}$ ).

The ambient sound levels are shown on the graphs on pages 3, 4 and 5.

To determine the noise levels of tennis playing, a comprehensive noise study of tennis playing for the Winterlodge in Palo Alto was referenced, Ref. (a). The Winterlodge study included the analysis of tennis playing by children, young adults, older adults and tennis pros. The tennis pro sound levels were determined to be the loudest and were used in this study to represent a worst-case condition. The Winterlodge study acquired tennis playing sound data at the Winterlodge courts, at the Cubberly courts in Palo Alto, at Brookside Tennis Club in Saratoga and at Las Palmas Tennis Courts in Sunnyvale.

Because of the extraordinary amount of noise data gathered for the Winterlodge study only the highest sound levels measured at all of the above tennis facilities were used in this study as the baseline sound levels.

The heights of ball hits during service were measured to be 8'10" for a person 6'1" tall and 8'7" for a person 5'9" tall.

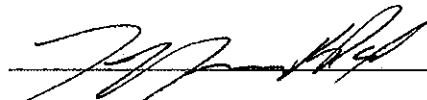
Standard acoustical barrier calculations were performed to determine the noise reduction provided by topographic shielding, as the homes to the east of the site are at a lower elevation and do not have a view to the tennis court surface or area slightly above the surface (5-6 ft.). The topographic shielding values are provided in Table I.

As the noise levels generated by tennis playing at the Horta residence are low in level, will be no different than other residential tennis courts in the area and will not generate a significant environmental noise impact to the neighbors, mitigation measures will not be required.

This report presents the results of a noise assessment study for the proposed outdoor tennis court at the Horta residence at 3115 Ralston Avenue in Hillsborough. The study findings are based on field measurements and other data and are correct to the best of our knowledge. If you have any questions or would like an elaboration on this report, please call me.

Sincerely

EDWARD L. PACK ASSOC., INC.

A handwritten signature in black ink, appearing to read 'Jeffrey K. Pack', is written over a horizontal line.

Jeffrey K. Pack  
President

Attachment: Appendices A, B and C

## **Appendix A**

### References:

- (a) "Acoustical Analysis for the Planned Tennis Court Remodel Project, Winterlodge of Palo Alto, 3009 Middlefield Road, Palo Alto", by Edward L. Pack Associates, Inc., Project No. 28-016, April 8, 1996

## **APPENDIX B**

### **Terminology, Instrumentation,**

#### **1. Terminology**

##### **A. A-Weighted Sound Level**

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

#### **2. Instrumentation**

The on-site field measurement data were acquired by the use of one or more of the sound analyzer listed below. The instrumentation provides a direct readout of the L exceedance statistical levels including the equivalent-energy level ( $L_{eq}$ ). Input to the meters were provided by microphones extended to a height of 5 ft. above the ground. The "A" weighting network and the "Fast" response setting of the meters were used in conformance with the applicable standards. The Larson-Davis meters were factory modified to conform with the Type 1 performance standards of ANSI S1.4. All instrumentation was acoustically calibrated before and after field tests to assure accuracy.

Bruel & Kjaer 2231 Precision Integrating Sound Level Meter

Larson Davis LDL 812 Precision Integrating Sound Level Meter

Larson Davis 2900 Real Time Analyzer

## **Construction Traffic Estimate**

**3115 Ralston Ave., Hillsborough**

**Construction and construction traffic:** will be managed by Mark Sinclair of Brewer Development LLC.

**Qualification:** Managed and built 6 single family homes in the last 5 years

### **Construction Phases**

**Demolition:** Approximately four total days of off hauling with approximately ten total truck loads (twenty trips) using three-axel trucks, spread roughly evenly over the four days. The day before demolition starts, one semi truck will deliver the excavator. Workmen vehicles will vary between one to four vehicles on any given day with an average of two work vehicles per day.

**Rough Grading:** Approximately nine days of off hauling, with approximately 8 total truck loads (sixteen trips), using five-axel trucks per day. The day before grading a single semi will deliver both a Compactor and Backhoe Loader. Workmen's vehicles will vary between one to four vehicles on any given day with an average of two work vehicles per day. Upon completion of the grading, one semi will make 4 trips to pick up all the demolition and grading machinery.

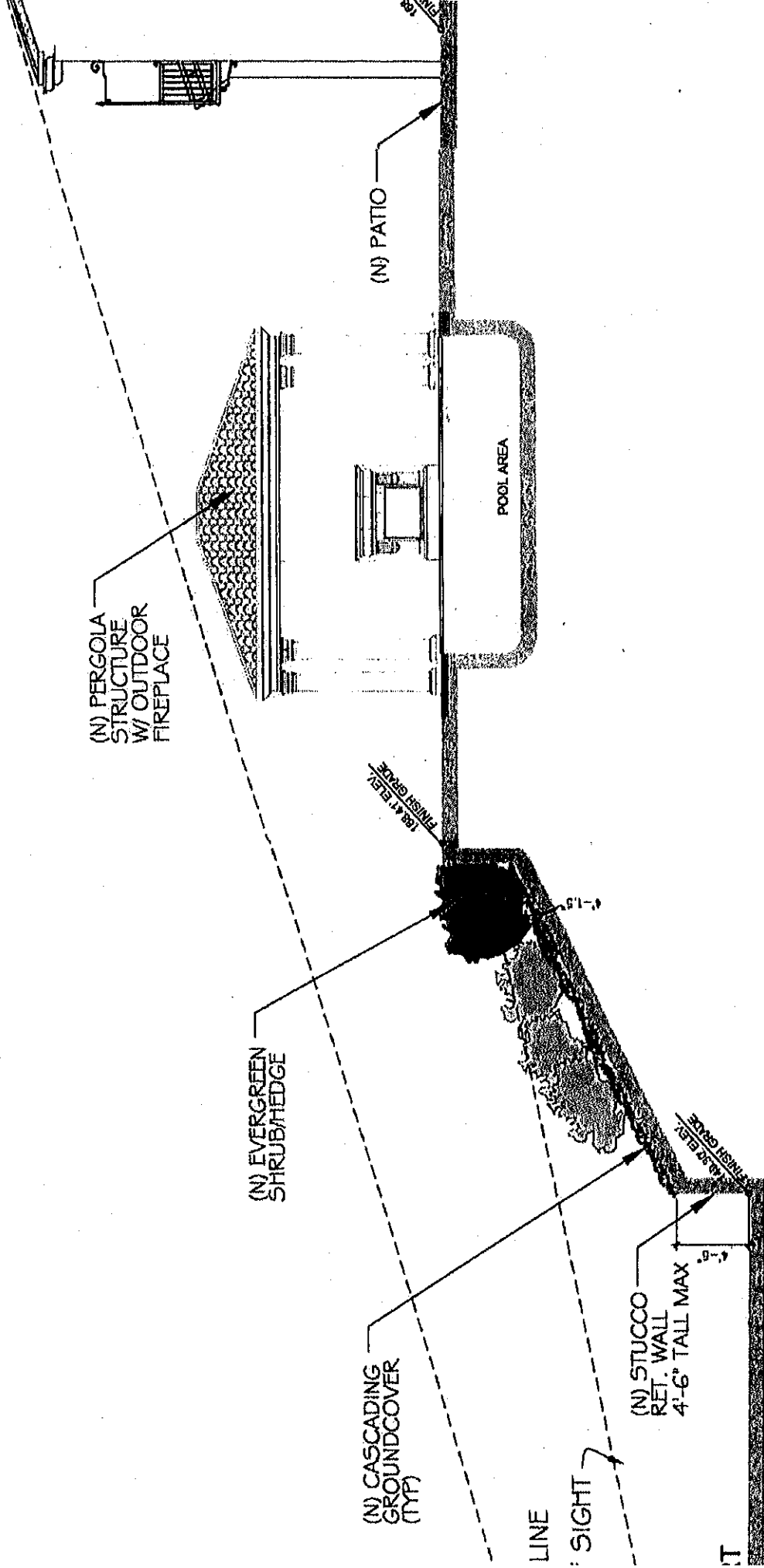
**Foundation and retaining walls:** Approximately three to four weeks of work. General deliveries will vary approximately from zero to two trucks on any given day with an average of 1 truck per day. During the pouring of the foundation there will be approximately 20 loads of cement (forty trips) delivered, spread roughly evenly over three days. Workmen's vehicles will vary between one to five vehicles on any given day with an average of three work vehicles per day.

#### **General framing and construction:**

**General deliveries:** Lumber, framing materials, sheetrock, windows, appliances, landscaping, roofing material, etc. Deliveries will vary from zero to three trucks on any given day with an average of one delivery per day over a period of approximately eleven months.

**Construction workmen vehicles:** Includes all two or less axel vehicles. Workmen's vehicles will vary between one to 10 vehicles on any given day with an average of four workmen's vehicles per day over a period of approximately twelve months.

**Conclusion:** On most days there will be traffic equal to or less than generated for a typical home in the area (including the trips of family members, gardeners and other hired help). On a few days there will be traffic in numbers similar to that occurring at a moderately sized party, such as those frequently held at houses in the area.





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