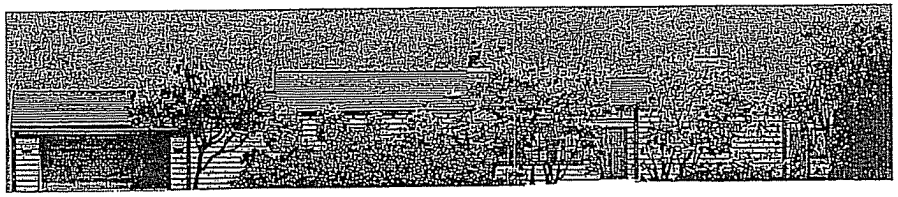
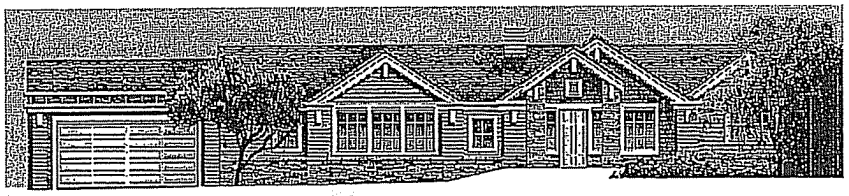
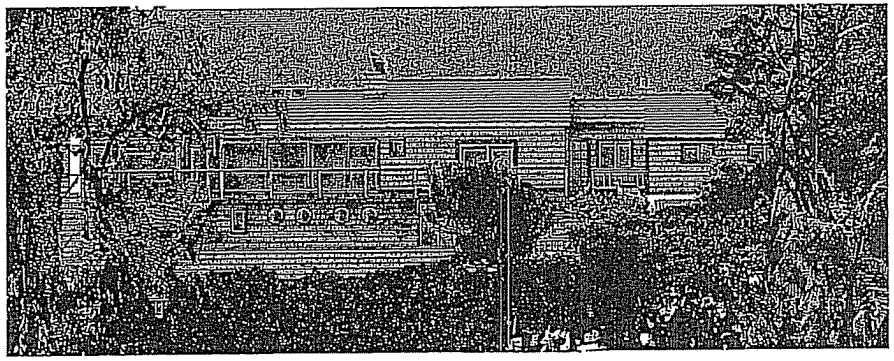


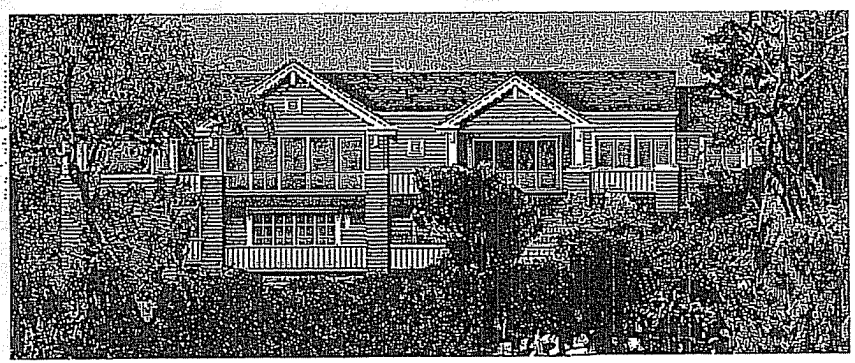
Existing West Elevation



Proposed West Elevation



Existing East Elevation



Proposed East Elevation

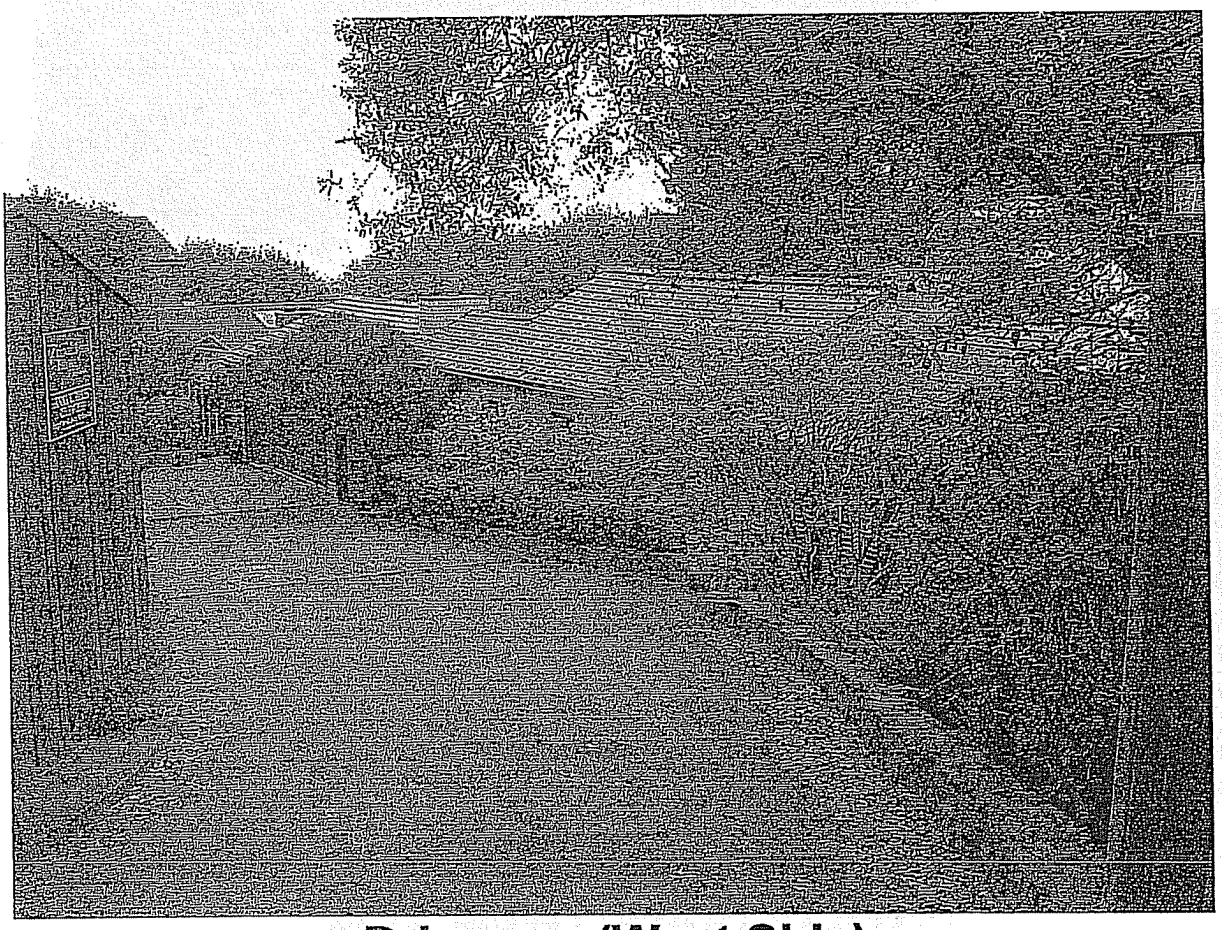
# 75 Cloud View Road

# Design Review Submittal

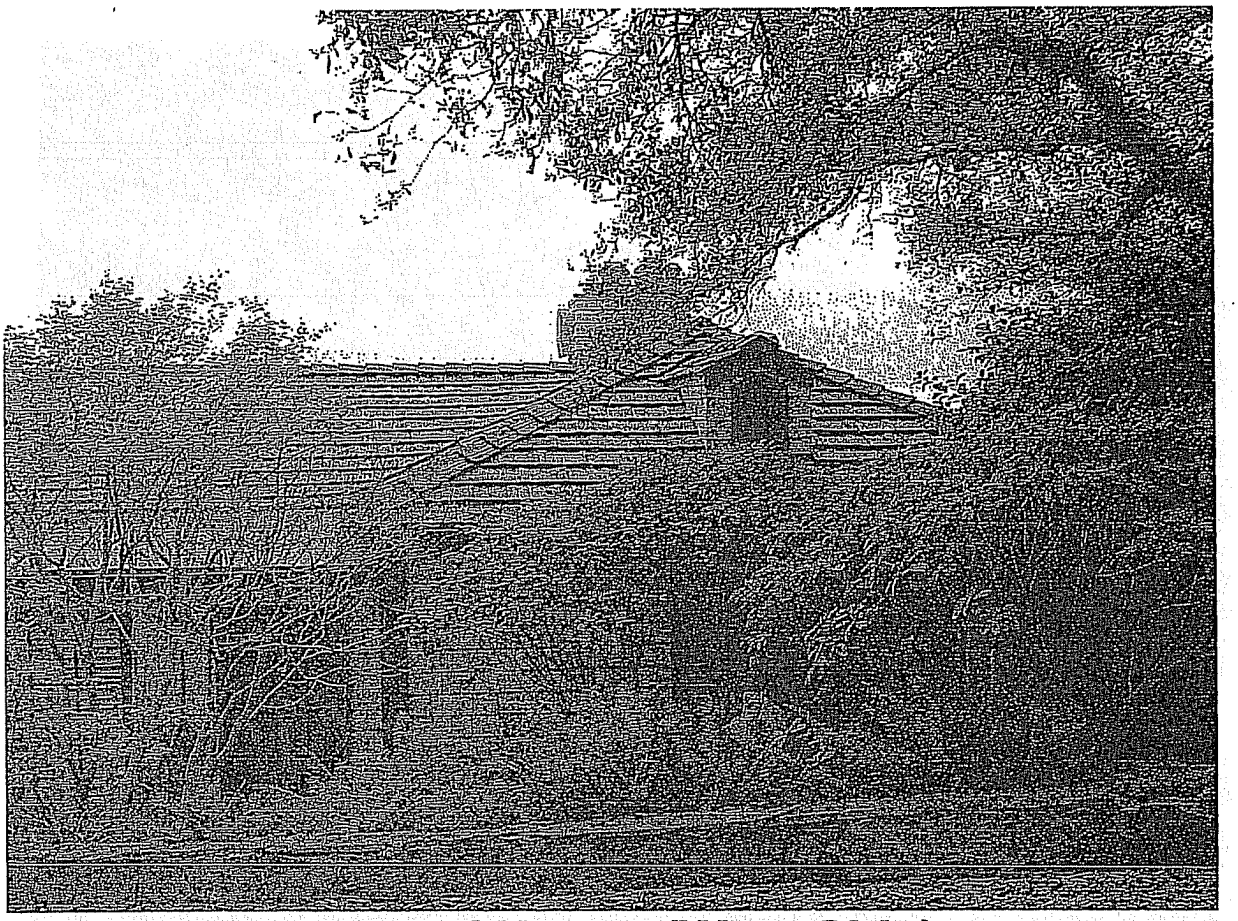
# 15 August 2007

## SITE PHOTOGRAPHS

5A
64

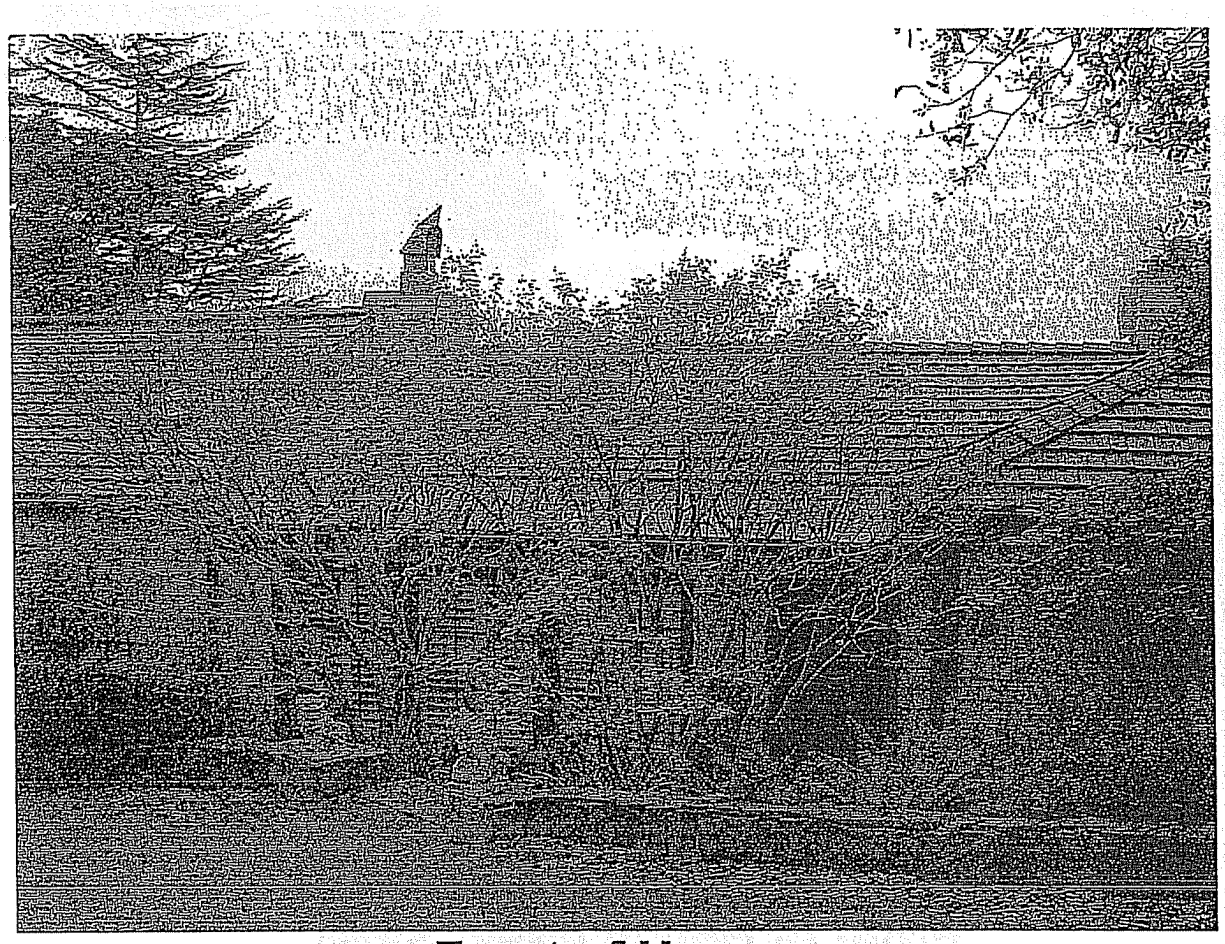


**Driveway (West Side)**



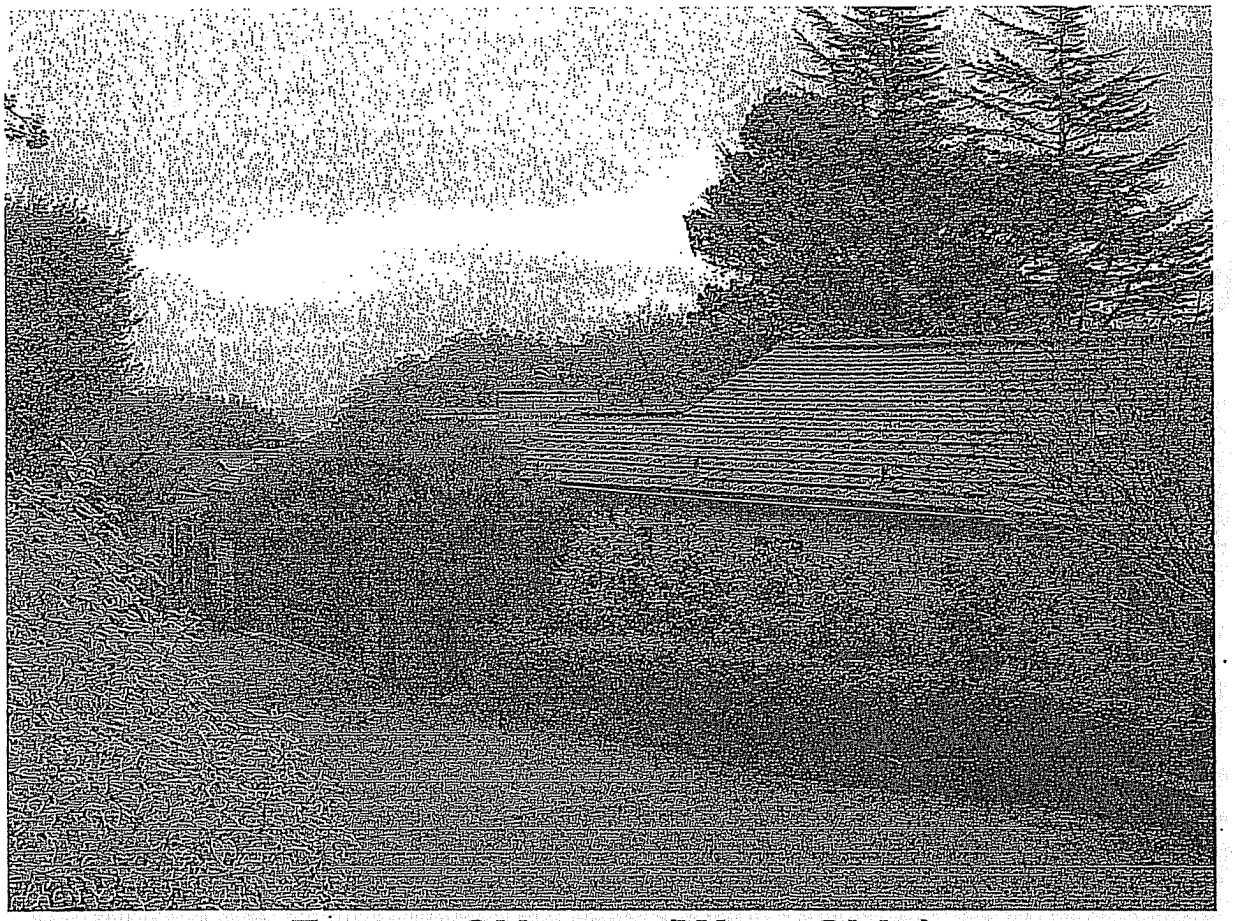
**Front of House (West Side)**

5A
66

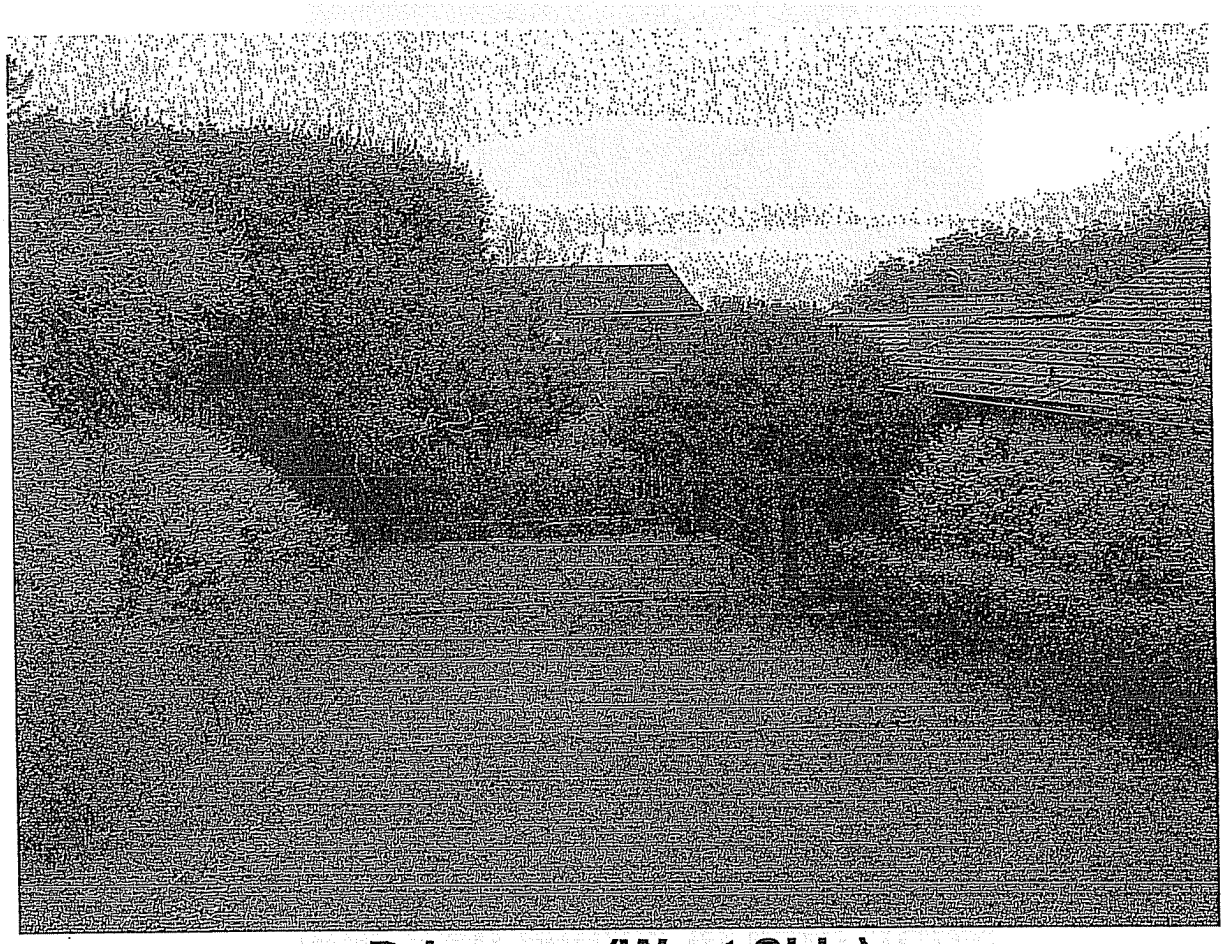


**Front of House**
**(West Side - Main Entrance)**

5A
67



**Front of House (West Side)**

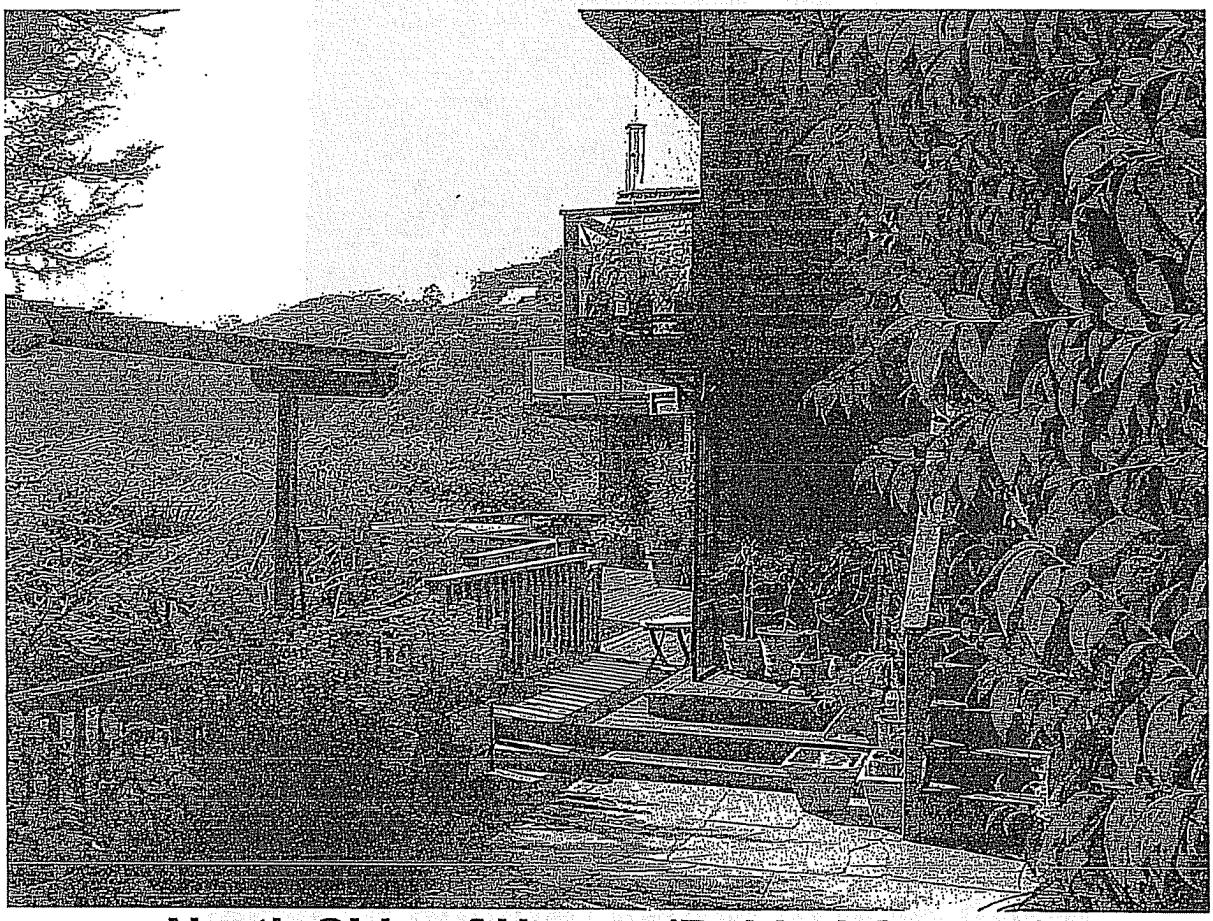


**Driveway (West Side)**

5A
69

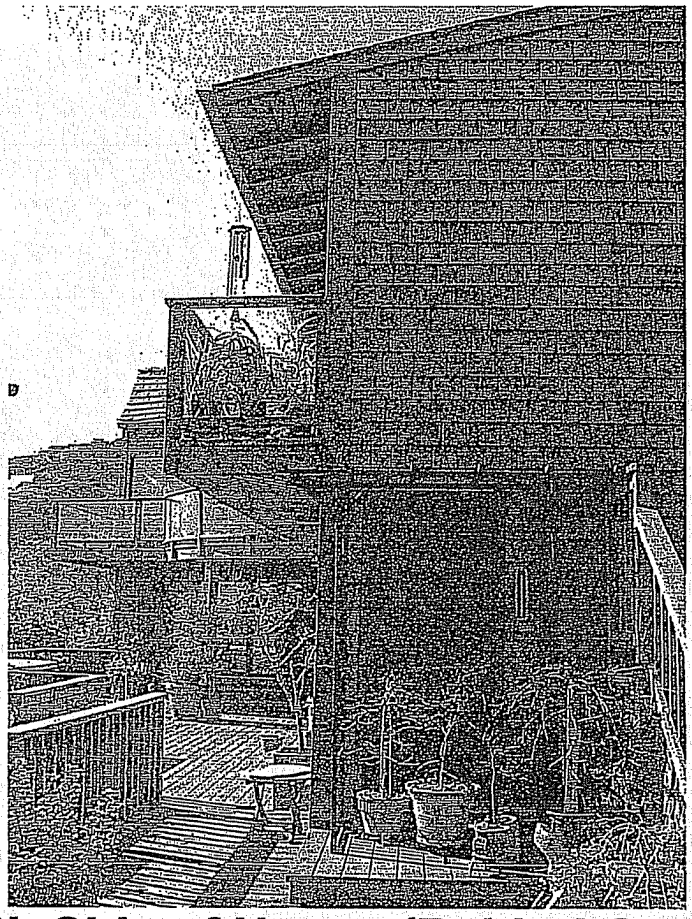
North Side of House (Garage)

5A
10



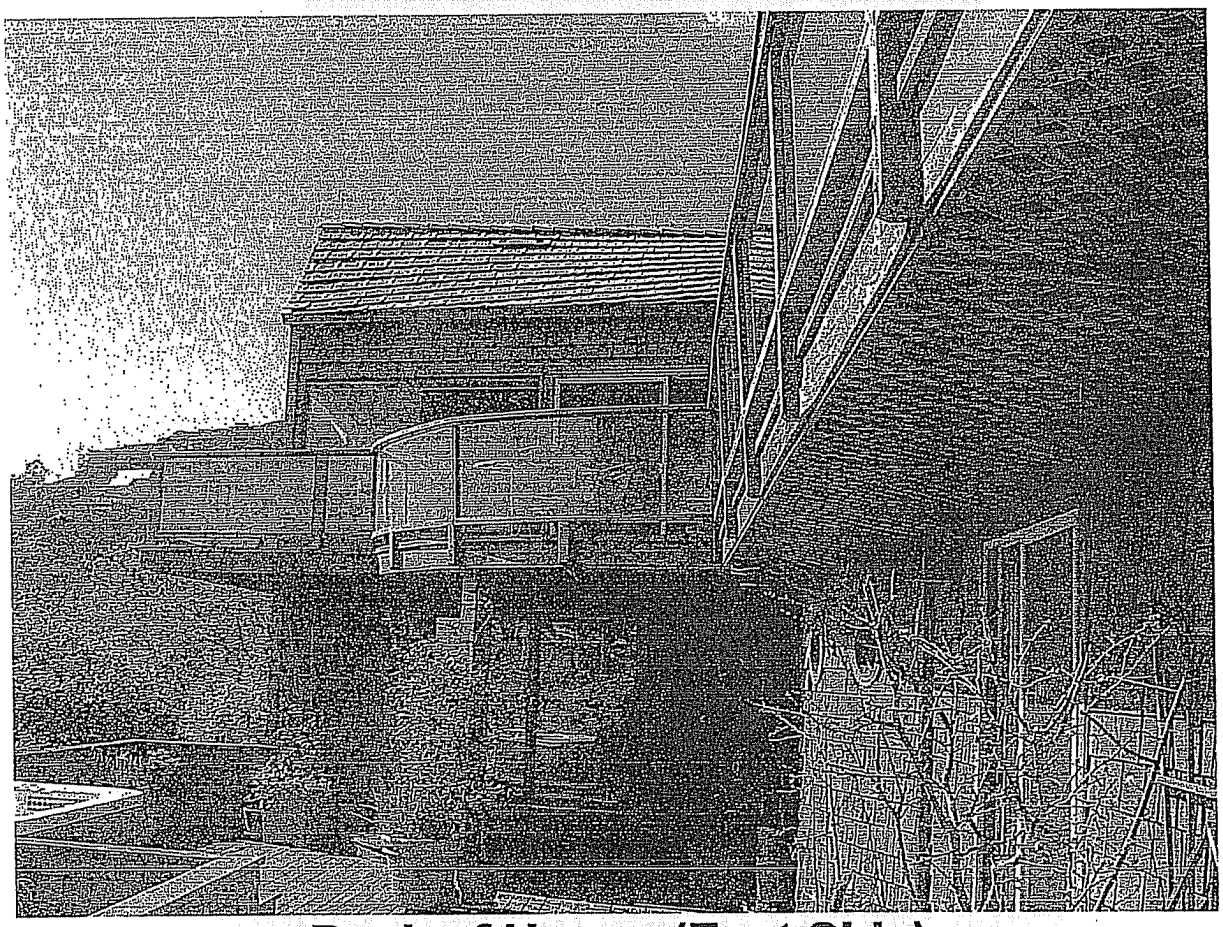
**North Side of House (Behind Garage)**

SA
71



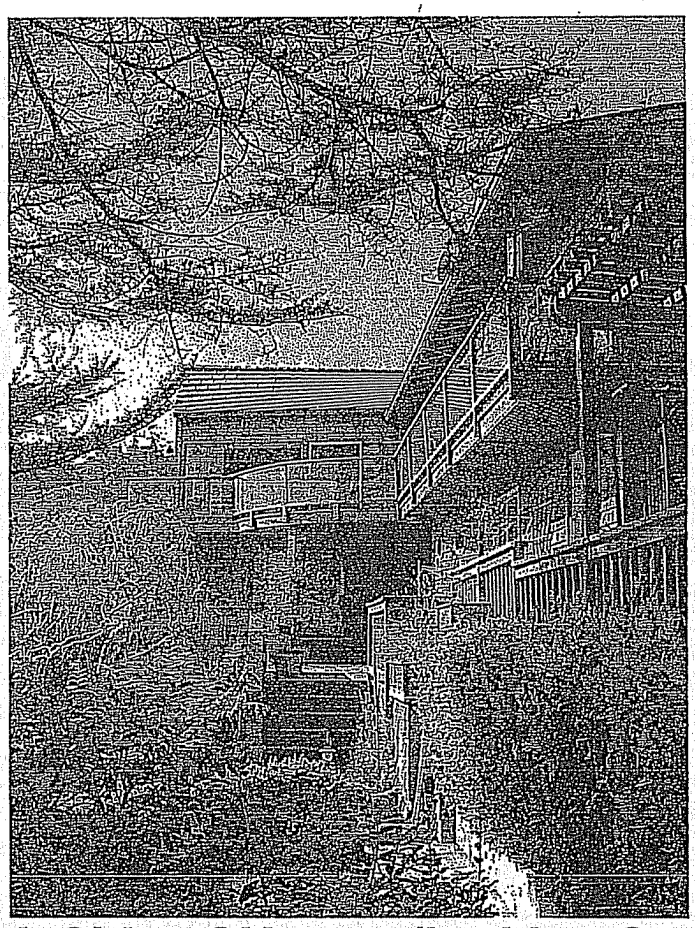
North Side of House (Behind Garage)

5A
72



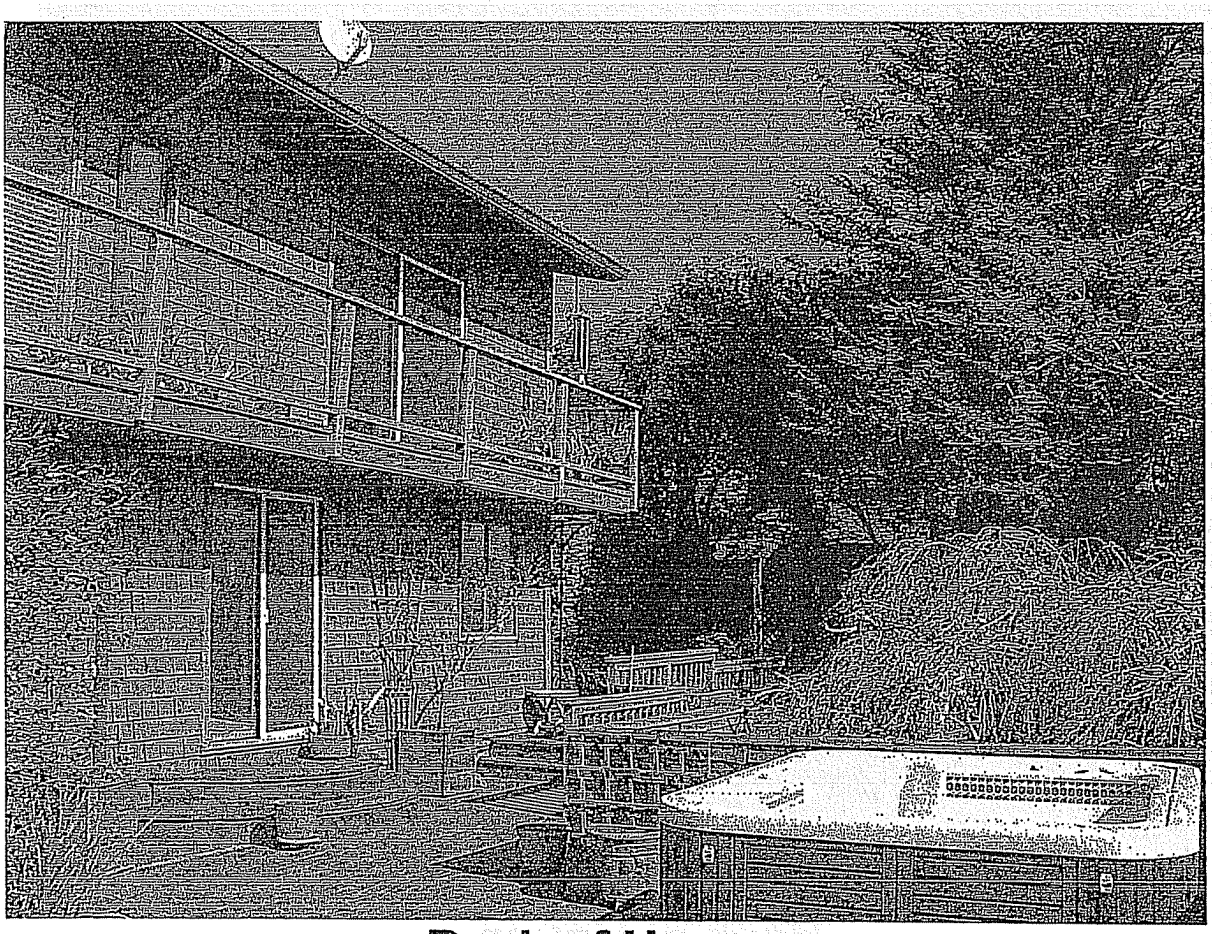
**Back of House (East Side)**

5A
73



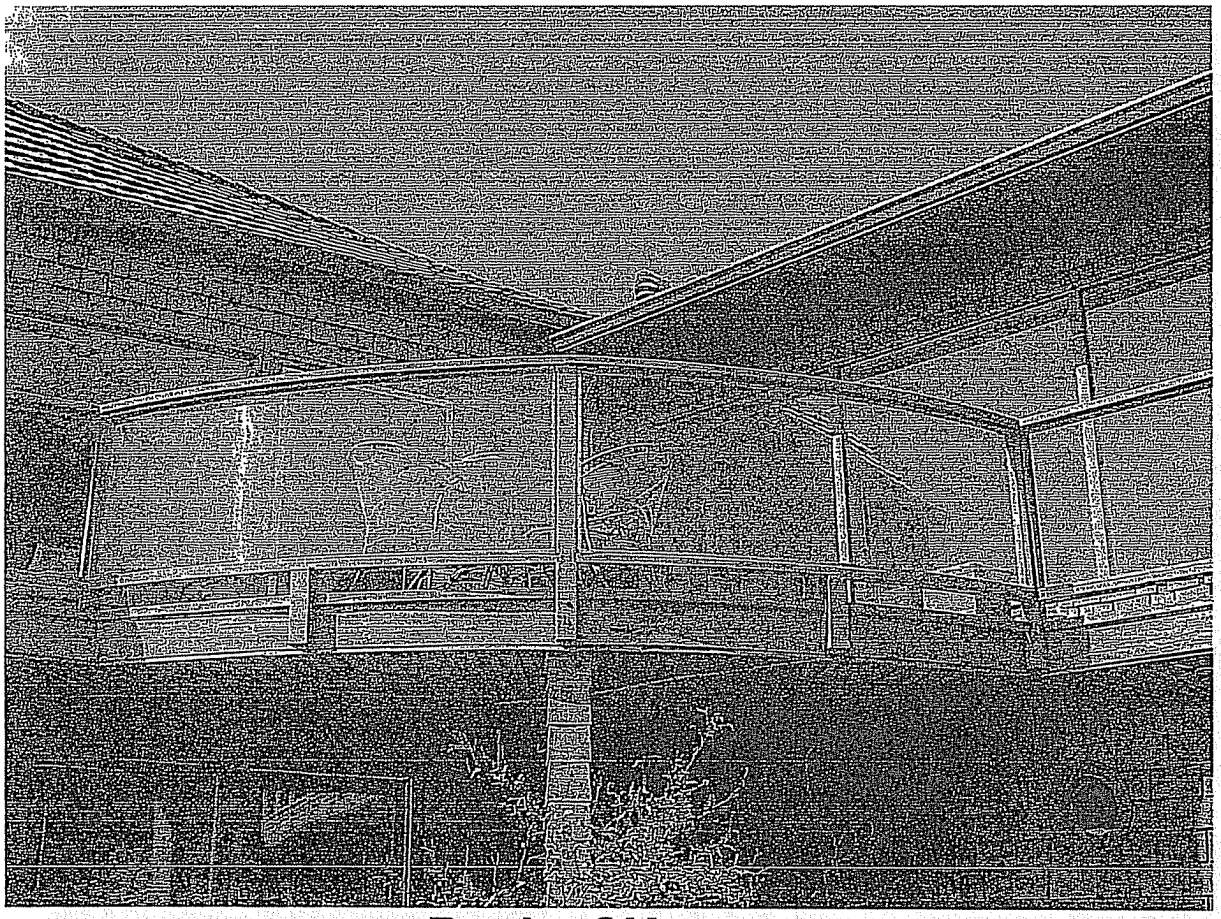
**Back Side of House (looking South)**

5A
74

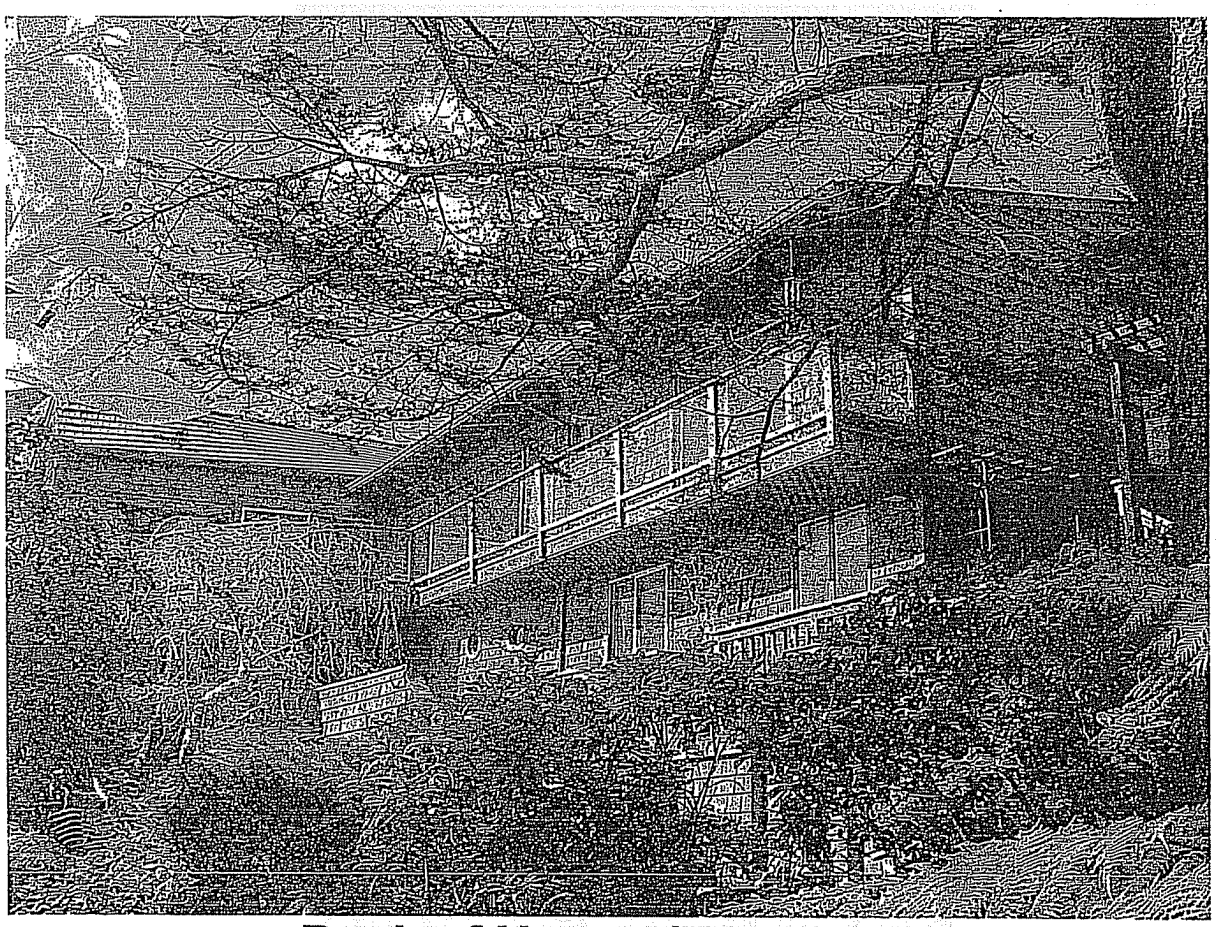


**Back of House**
**(East Side looking North)**

5A
75

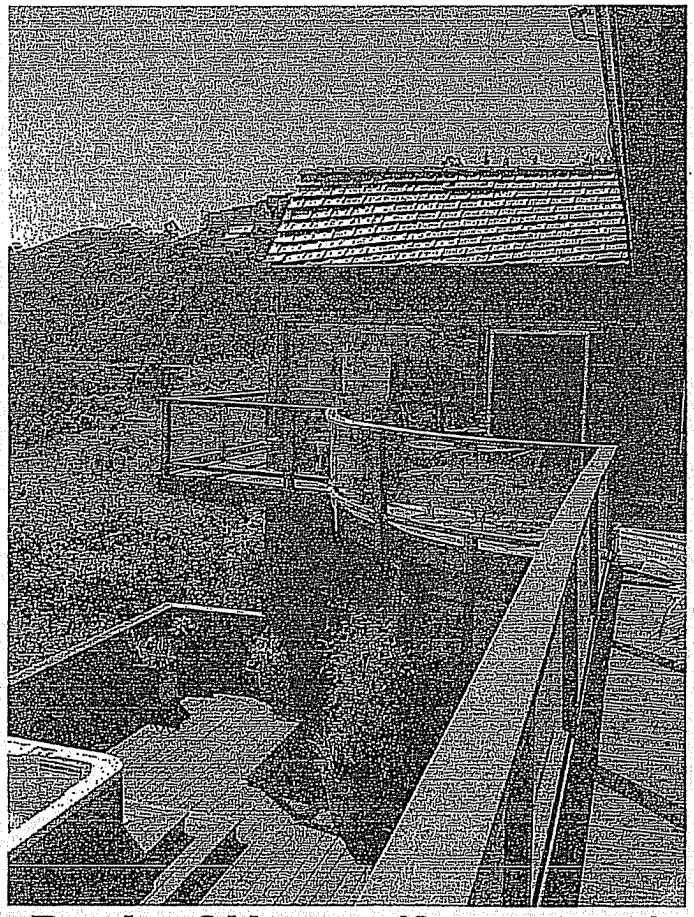


**Back of House**
**(Main Deck)**



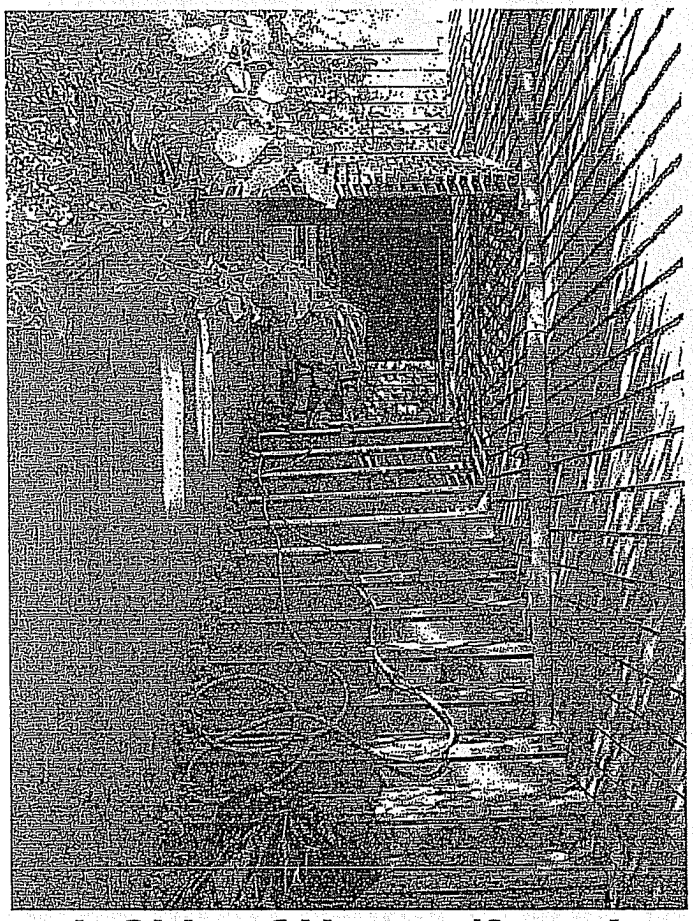
**Back of House (East Side)**

5A
77



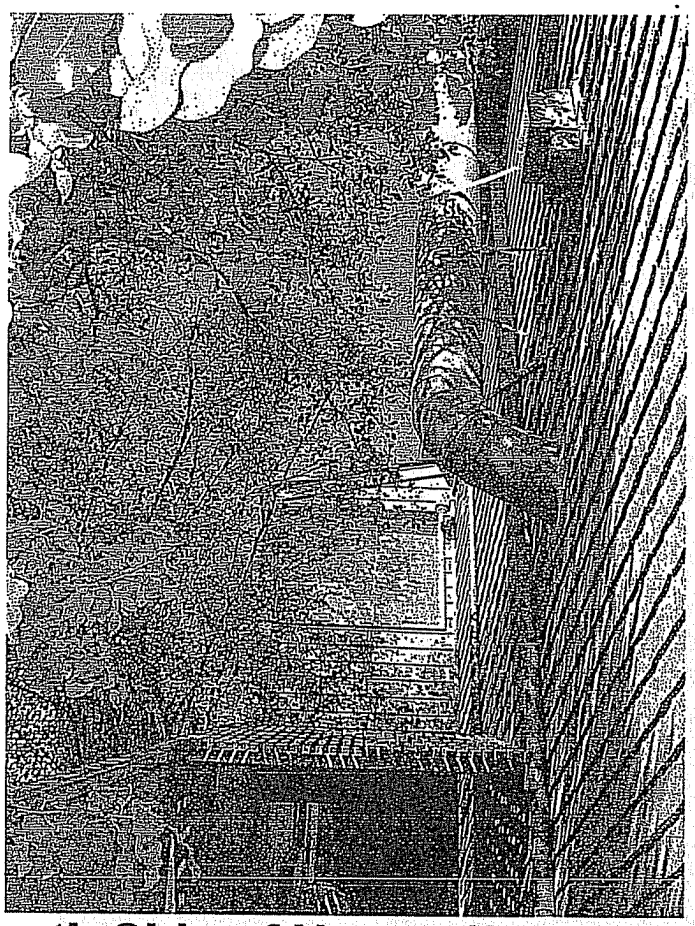
**Back of House (from deck)**

5A
78



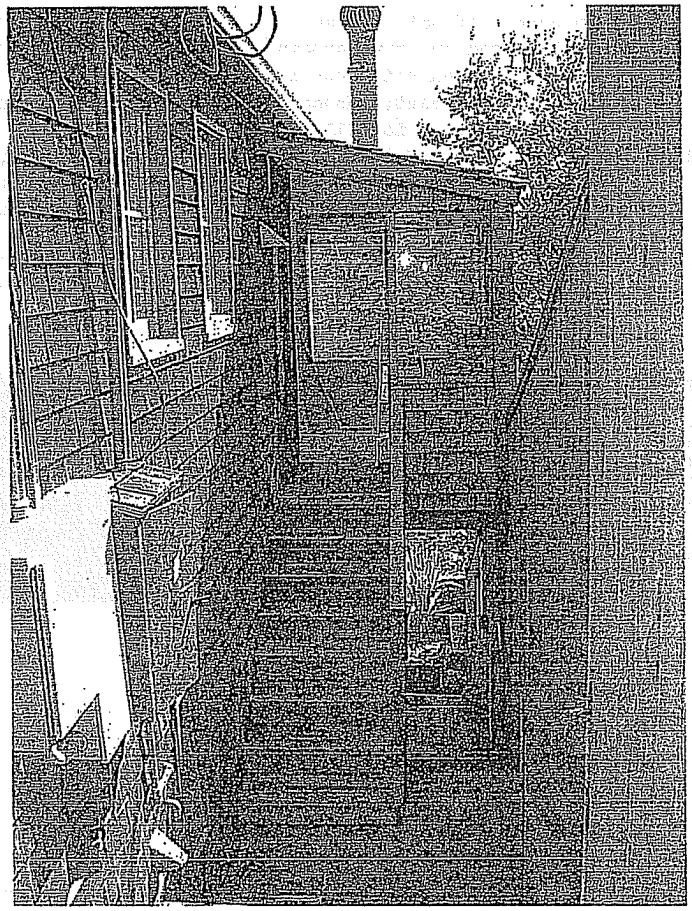
**South Side of House (from back)**

5A
79



**South Side of House (from back)**

5A
80



**South Side of House (from front)**

5A
81

6255

# 75 CLOUD VIEW ROAD

DECLARATION OF HOMESTEAD

KNOW ALL MEN BY THESE PRESENTS: That I, WILBUR O. ATEN, do hereby declare that I am married and the head of a family; that my wife's name is Mabel E. Aten, and that I do now, at the time of making this declaration, actually reside on the premises hereinafter described. That my family consists of my said wife Mabel E. Aten. That the premises on which I reside are situate in the Town of Mill Valley, County of Marin, State of California, and are bounded and described as follows, to-wit:

Beginning at a point on the northeasterly line of Eldridge Avenue, said point being distant from common corner of Lots Nos. 111 and 112 as the same are laid down and delineated on that certain map hereinafter mentioned south 16° 41' west 6.79 feet, running thence south 81° 55' east 26.87 feet to a point, thence north 58° 57' east 49.63 feet to a point, thence north 88° 20' east 94.71 feet to the corner common to lots Nos. 111 and 112, thence north 16° 09' west 84 feet to the corner common to lots 110 and 111 and thence westerly along the dividing line between lots 110 and 111, 98. 55 feet to a point; thence at right angles northerly 5 feet to a point; thence westerly along a line parallel with and distant 5 feet from the southerly line of said Lot 110, to the westerly line of said lot; thence southerly along the said westerly line of Lot 110 to the corner common to Lots 110 and 111; thence along the westerly line of said Lot 111, south 35° 56' east 100.07 feet and south 16° 41' west 6.79 feet to the point of beginning.

Excepting therefrom all that portion of the above described tract of land described as follows, to-wit:

Beginning at the northeasterly corner of Lot 111, said corner being common to Lots 110 and 111 as the same are laid down and delineated on that certain map hereinafter mentioned; running thence westerly along the dividing line between said Lots 110 and 111, 98.55 feet to a point; thence at right angles southerly 10 feet to a point; thence easterly along a line parallel with and distant 10 feet from the northerly line of said Lot 111, to the easterly line of said Lot; thence northwesterly along the said easterly line of Lot 111 to the point of beginning.

Being portions of Lots 110, 111 and 112 as the same are laid down and delineated on that certain map entitled "Map of Cushing's Blythedale Subdivision No. 2 Mill Valley, Marin Co. Cal." and filed for record in the office of the Recorder of said Marin County.

That I do by these presents claim the premises above described, together with the dwelling house thereon, and the appurtenances, as a homestead. That the actual cash value of



241

said premises is estimated to be Six Thousand ($6000.00) Dollars.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 23d day of July, 1938.

WILBUR O. ATEN

STATE OF CALIFORNIA )
COUNTY OF MARIN ) ss.

On this 23d day of July in the year one thousand nine hundred and thirty-eight, before me, Nila C. Huntoon, a Notary Public in and for the County of Marin, State of California, residing therein, duly commissioned and sworn, personally appeared Wilbur O. Aten, known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same. IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, in the County of Marin, the day and year in this certificate first above written.

(SEAL)

NILA C. HUNTOON
Notary Public in and for the County of Marin, State of California

My commission expires Feb. 27th, 1941.

Filed for record and recorded
at the request of C. H. Van Harvey, Sep. 23, 1938 at 54 mins past 11 o'clock A.M.

J. W. FALLON, Recorder

Rec. Fee $1.30

By [illegible] Deputy

---

6270

I. R. S. $7.50 cancelled

[illegible] this fifteenth day of September one thousand nine hundred and

5A
82

said premises is estimated to be Six Thousand ($6000.00) Dollars.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this 23d day of July, 1938.

WILBUR O. ATEN

STATE OF CALIFORNIA )
COUNTY OF MARIN ) ss.

On this 23d day of July in the year one thousand nine hundred and thirty-eight, before me, Nila C. Huntoon, a Notary Public in and for the County of Marin, State of California, residing therein, duly commissioned and sworn, personally appeared Wilbur O. Aten, known to me to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same. IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, in the County of Marin, the day and year in this certificate first above written.

(SEAL)

NILA C. HUNTOON
Notary Public in and for the County of Marin, State of California

My commission expires Feb. 27th, 1941.

Filed for record and recorded
at the request of C. H. Van Harvey, Sep. 23, 1938 at 54 mins past 11 o'clock A.M.

J. W. FALLON, Recorder
By [illegible] Deputy

Rec. Fee $1.30

---

6270

I. R. S. $7.50 cancelled

THIS INDENTURE, made the fifteenth day of September one thousand nine hundred and thirty-eight, between SEIBERT LEE SEFTON and MIMI STONE SEFTON, his wife, the parties of the first part, and CLYDE F. PARKER and MARY M. PARKER, his wife, the parties of the second part, WITNESSETH: That the said parties of the first part, in consideration of the sum of Ten 00/100 Dollars, lawful money of the United States of America, to them in hand paid by the said parties of the second part, the receipt whereof is hereby acknowledged do by these presents grant, bargain, and sell unto the said parties of the second part, in joint tenancy and to the survivor of them, and to the heirs and assigns of such survivor forever, all those certain lots, piece or parcels of land situate in City of Sausalito, County of Marin, State of California, and bounded and described as follows, to-wit:

PARCEL ONE: Beginning at a point on the Southeasterly line of that certain tract of land conveyed to Edna Van Rensselaer Moore and Clarence Marshall Moore, her husband, by deed recorded October 19, 1934 in Volume 274 of Official Records at page 460, Marin County Records, distant thereon South 41° 00' West 100 feet from the most Easterly corner of said tract, and running thence North 58° 21' East 104 feet to the aforesaid Southeasterly line, thence along said line, North 41° 00' East 52 feet, to the point of beginning.

West 104 feet, thence South 41° 00' West 52 feet, thence South 58° 21'

PARCEL TWO: Beginning at a point on the Southeasterly line of that certain tract of land conveyed to Edna Van Rensselaer Moore and Clarence Marshall Moore, her husband, by deed recorded October 19, 1934 in Volume 274 official records at page 460, Marin County Records, distant thereon South 41° 00' West 152 feet from the most Easterly corner of said tract, and running thence North 58° 21' West 104 feet, thence South 41° 00' West 52 feet, thence South 58° 21' East 104 feet to the aforesaid Southeasterly line, thence along said line North 41° 00' East 52 feet to the point of beginning.

These properties are restricted to a one, one family dwelling whose height shall not exceed 30 feet on a vertical distance from the ground level on the upper side to the peak of the roof.

An easment for ingress and egress over the above described properties is hereby granted and is described as follows:

BEGINNING at the most Westerly corner of the above described parcel TWO and running North 58° 21' West 99.31 feet to the southerly line of Cobb Avenue Extension, thence along said Avenue line on a curve to the right whose center bears North 44° 36' West and whose radius is 220 feet distance 13.67 feet, thence South 48° 58' West 1.74 feet, thence leaving said Cobb Avenue Extention and running South 58° 21' East 116.04 feet, thence North 41° 00' East 15 feet, thence North 58° 21' West 15 feet to the point of beginning.

RESERVING a right of way over and across the above described properties for the installation and maintenance of sewer, water , gas and electric service. The above described

[illegible] portion of Lot 5, Sausalito Rancho as per deed to E. A. Patent recorded

5A 83

92 feet to the point of beginning.

These properties are restricted to a one, one family dwelling whose height shall not exceed 30 feet on a vertic distance from the ground level on upper side to the peak of the roof.

An easement for ingress and egress over the above described properties is hereby granted and is described as follows:

BEGINNING at the most Westerly corner of the above described parcel TWO and running North 58° 21' West 99.31 feet to the southerly line of Cobb Avenue Extension, thence along said Avenue line on a curve to the right whose center bears North 44° 36' West and whose radius is 220 feet distance 13.67 feet, thence South 48° 58' West 1.74 feet, thence leaving said Cobb Avenue Extention and running South 58° 21' East 116.04 feet, thence North 41° 00' East 15 feet, thence North 58° 21' West 15 feet to the point of beginning.

RESERVING a right of way over and across the above described properties for the installation and maintenance of sewer, water , gas and electric service. The above described properties are a portion of Lot 5, Sausalito Rancho as per deed to F. A. Detert, recorded April 3, 1924 in Liber 46 of Official Records of Page 97, records of Marin County. TOGETHER with the tenements, hereditaments, and appurtenances thereunto belonging or appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof. TO HAVE AND TO HOLD the said premises, together with the appurtenances, unto the said parties of the second part, as joint tenants, and not as tenants in common, with right of survivorship, and to the heirs and assigns of such survivor forever. IN WITNESS WHEREOF, the said parties of the first part, have hereunto set their hands the day and year first above written.

Signed and delivered in the) SEIBERT LEE SEFTON
presence of ----------) MIMI STONE SEFTON

STATE OF CALIFORNIA )
COUNTY OF MARIN ) ss.

On this 15th day of September in the year one thousand nine hundred and thirty-eight, before me, Edna V. Moore, a Notary Public in and for the County of Marin, State of California, residing therein, duly commissioned and sworn, personally appeared Seibert Lee Sefton and Mimi Stone Sefton, his wife, known to me to be the persons whose names -- subscribed

[redacted]

within instrument and acknowledged to me that they executed the same. IN WITNESS
, I have hereunto set my hand and affixed my official seal, in Sausalito County of
the day and year in this certificate first above written.

(SEAL) EDNA V. MOORE
Notary Public in and for the County
of Marin, State of California.

mission expires Apr. 14, 1940.

for record and recorded
request of San Rafael Land Title Co. Sep. 23, 1938 at 47 mins past 3 o'clock P.M.

J. W. FALLON, Recorder
By [illegible] Deputy

ee $1.40

---

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA, IN AND FOR THE COUNTY OF MARIN

Matter of the Estate of ) No. 5592
FAIRBANKS RICH, )
Deceased. )
)

Karl Brooks, Esq.,
Suite #1, Prince Building,
Petaluma, California,
Attorney for Executors.

SA 84

MEMORANDUM

TO: Sausalito Planning Commission

FROM: Sausalito Historic Landmarks Board

RE: 75 Cloudview Road

DATE: September 19, 2007

## Methodology

Pursuant to City Council direction, it is the responsibility of the Sausalito Historic Landmarks Board to examine any remodel or demolition application in the City if the application involves a structure of fifty or more years of age. The Board assigns two members to review each project and to consider the gathered information and produce this report. Our report is not intended to replace or augment any technical reports pertaining to this project: any comments regarding structural integrity, engineering, etc., are purely observational.

## Architectural Research

Records from the Marin County Assessor's office indicate that this is a single-family residence that was built in 1937 (Book:65; Page:19; Blk:191). The property was apparently a shingled cottage when built although the extensive modifications to the property over the years have made it difficult to discern precisely its original architectural design.

A review of the Sausalito Planning Department records confirms that the property has gone through several additions and alterations prior to its current application. The earliest construction work in the records note the addition of a dining room and another room in 1962; subsequent additions and changes were also noted. There were likely other changes to the property that are not included in the Planning Department records since they were probably made before such records were kept.

The current structure has different and conflicting architectural elements that the current proposal is intended to address.

## Historical Research

The earliest names appearing in the Marin County Recorder files as owners of the property are Charles Albert Wright and Linda Hamilton Wright in a deed dated October 15, 1929. The Wrights sold the property in 1929 to Clarence Marshall Moore and Edna Van Rensselaer Moore. The property had a number of subsequent owners over the years; not all of the names of the subsequent owners have been discovered; none of the owners that have been identified appear important to the history of Sausalito.

SA
85

194 San Carlos Avenue
Historic Landmarks Board Review
September 5, 2007

**Findings**

1. **Is the structure associated with events that have made a significant contribution to the broad patterns of the history or cultural heritage of Sausalito, California, or the United States?**

   The board finds No Significance under this criterion.

2. **Is this structure associated with the life or lives of one or more people important to our past?**

   The board finds No Significance under this criterion.

3. **Does the structure embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values?**

   The board finds No Significance under this criterion.

4. **Has the structure yielded, or may be likely to yield, information important in prehistory or history?**

   The boards finds No Significance under this criterion.

**Recommendations**

The Board provided no recommendations for the project.

**Researched and Submitted by:** Thomas Theodores and Jason Weisberger

**The Sausalito Historic Landmarks Board, at their publicly noticed meeting of September 19, 2007, acknowledged this memorandum:**

AYES: Nichols, Monsef, Theodores
NOES:
ABSTAIN:
ABSENT: Weisberger

5A
86

Pierre & Cecilia VACHERAND
75 Cloud View Road
SAUSALITO, CA 949
Tel: 415-887-9474

City of SAUSALITO
420 Litho Street
SAUSALITO, CA 94965

August 21st, 2007

DESIGN REVIEW MEETINGS WITH NEIGHBORS - 75 Cloud View Road

**First neighbors meeting: Friday May 18th 2007**
-Tour of the house
-Presentation of the plans

Neighbors present:
John and Susan ROBINSON: 63 Cloud View Road

Comments: "Nice improvement"

**Second meeting: Saturday June 2nd 2007**
-Tour of the house
-Presentation of the plans

Neighbors present:
Jan SAAFIELD & Jim: 81 Cloud View Road
Matsuno PATRICK: 73 Cloud View Road
Larry BEDARD: 88 Prospect Street

Comments: "We like the gables, the house will look much better ".

**Third neighbors meeting Friday, August 17th 2007:**
-All neighbors invited for the completed plans and the rendering in color.

Neighbors present:
John TOTHILL and Karin BRUCE: 71 Cloud View Road
Larry BEDARD: 88 Prospect Street
Jan SAAFIELD & Jim: 81 Cloud View Road

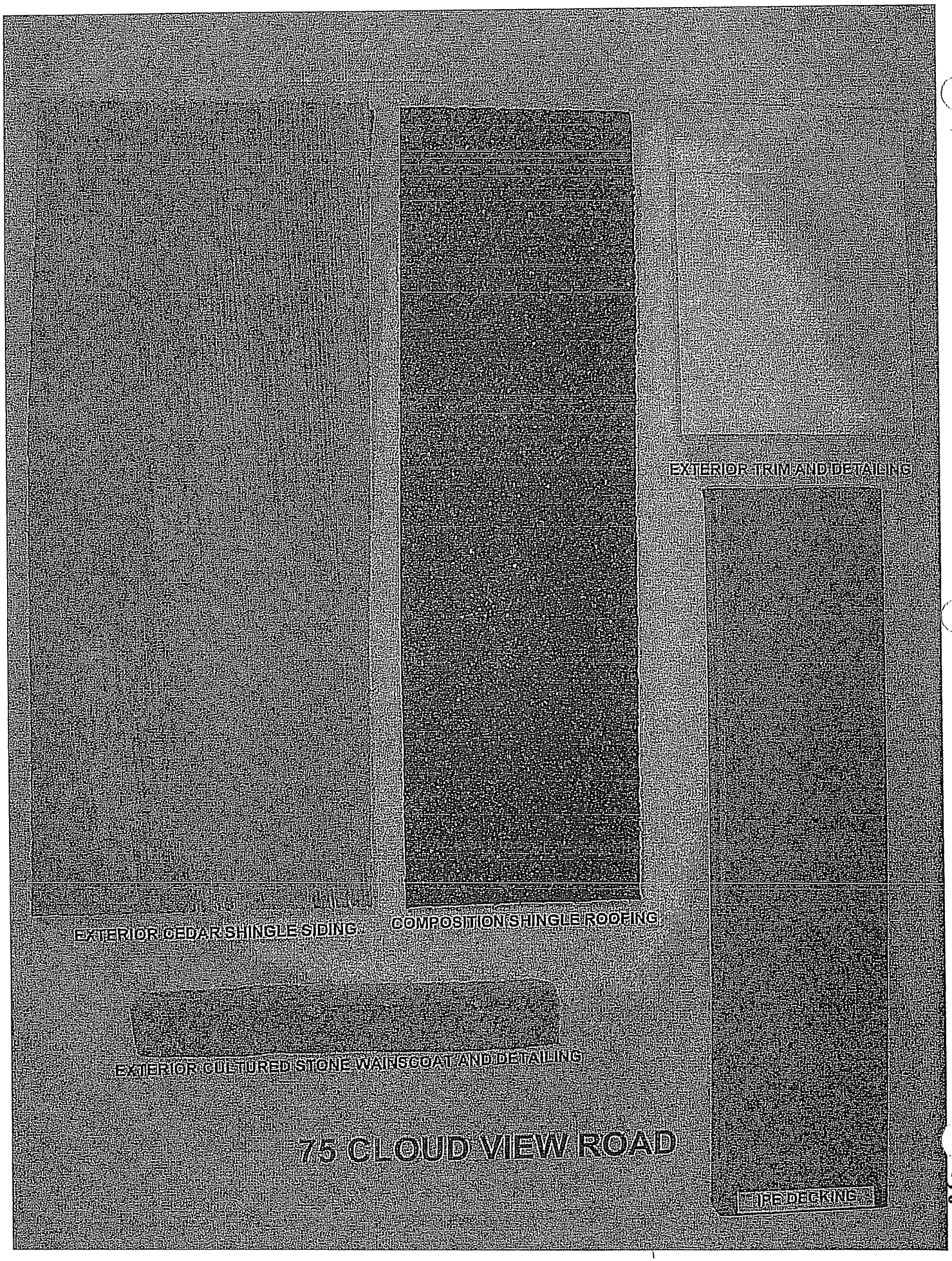
Comments: Very positive reactions. They all like the new elevations. They are also satisfied that their views will not be altered by our remodeling.

Remark: Matsuno PATRICK and John & Susan ROBINSON were out of town, we will show them the proposed plans when they will be back.

Pierre & Cecilia Vacherand



SA
87


EXTERIOR TRIM AND DETAILING
EXTERIOR CEDAR SHINGLE SIDING
COMPOSITION SHINGLE ROOFING
EXTERIOR CULTURED STONE WAINSCOAT AND DETAILING
75 CLOUD VIEW ROAD
FIRE DECKING

SA 88

HERZOG
GEOTECHNICAL
CONSULTING ENGINEERS

October 17, 2007
Project Number 2187-01-07

Pierre and Cecilia Vacherand
75 Cloud View Road
Sausalito, California 94965-2006

RE: Geotechnical Investigation
Proposed Additions and Renovations
75 Cloud View Road
Sausalito, California

Dear Mr. and Mrs. Vacherand:

This presents the results of our geotechnical investigation for the proposed additions and renovations at 75 Cloud View Road in Sausalito, California. The scope of our investigation was to review selected geologic references, observe exposed site conditions, drill four test borings, perform laboratory testing and engineering analyses, and develop geotechnical conclusions and recommendations for the project. Our scope of work was outlined in our professional services agreement dated October 1, 2007.

## PROJECT DESCRIPTION

The project will consist of renovating the existing residence, and constructing additions onto the southeast and northwest sides of the structure. The project is shown on the plans by David R. Kalb, AIA Architecture dated August 15, 2007.

## WORK PERFORMED

Prior to performing our investigation, we reviewed selected geologic references. We explored the subsurface conditions in the project area on October 11, 2007 to the extent of four test borings between approximately 3 and 13 feet deep, and extending into bedrock. Due to limited access, the test borings were drilled with portable drilling equipment. The locations of the test borings are shown on the attached *Site Plan*, Plate 1.

Our Consulting Project Engineer observed the drilling, logged the subsurface conditions encountered, and collected soil samples for visual examination and laboratory testing. Samples were retrieved using Sprague and Henwood and Standard Penetration Test samplers driven with a 70-pound hammer. Penetration resistance blow counts were obtained by dropping the hammer through a 30-inch free fall. The samplers were driven 18 inches, and the number of blows was recorded for each 6 inches of penetration. These blow counts were then correlated to equivalent

standard penetration resistance blow counts. The blows per foot recorded on the boring logs represent the accumulated number of correlated standard penetration blows that were required to drive the sampler the last 12 inches or fraction thereof.

Logs of the test borings are presented on Plates 2 through 5. The soils encountered are described in accordance with the criteria presented on Plate 6. Bedrock is described in accordance with the *Engineering Geology Rock Terms* presented on Plate 7. The logs depict our interpretation of subsurface conditions on the date and at the depths indicated. The stratification lines on the logs represent the approximate boundaries between soil types; the actual transitions may be gradational.

Selected samples were laboratory tested to determine their moisture content, dry density and plasticity. Laboratory test results are posted on the boring logs in the manner described on the *Key to Test Data*, Plate 6. The results of the Atterberg Limits plasticity testing are presented on Plate 8.

## FINDINGS

### Site Conditions

The site is located on the southeastern side of Cloud View Road in Sausalito, California. The site is a hillside which extends down towards the southeast at inclinations between approximately 2:1 and 4:1 (horizontal:vertical). The existing residence is a partial three-level structure with a combination of raised wood and slab-on-grade floors. The house is generally surrounded by decking, landscaping and walkways. Roof downspouts for the house discharge onto the ground adjacent to the structure. Level landscape terraces downslope of the structure are retained by low stone retaining walls.

### Subsurface Conditions

The site is within the Coast Range Geomorphic Province, which includes San Francisco Bay and the northwest-trending mountains that parallel the coast of California. These features were formed by tectonic forces resulting in extensive folding and faulting of the area. Previous geologic mapping by Rice (1976) indicates that the site is underlain by radiolarian chert bedrock of the Franciscan Assemblage.

Our test borings encountered fill and colluvium (slopewash) overlying bedrock. The fill encountered generally consisted of soft and organic sandy silt and of stiff gravelly clay. The colluvial soils encountered consisted of medium stiff to stiff gravelly clay and loose clayey gravel. The fill and native soils encountered are relatively weak and compressible, and are subject to gradual downslope creep on hillsides. In addition, portions of the fills and native soils

encountered are expansive. Expansive soils undergo changes in volume with changes in moisture content, and can cause slabs and lightly loaded foundations to heave and crack. Bedrock encountered in the borings generally consisted of firm to moderately hard chert.

The approximate test boring locations are shown on the *Site Plan* (Plate 1). The test borings encountered the following profiles:

| | Depth (feet) | | |
|---|---|---|---|
| **Boring** | **Fill** | **Colluvium** | **Bedrock** |
| B-1 | 0-1.0 | 1.0-9.0 | 9.0-13.0+ |
| B-2 | 0-8.5 | --- | 8.5-10.5+ |
| B-3 | 0-1.0 | 1.0-2.5 | 2.5-3.0+. |
| B-4 | 0-1.5 | 1.5-3.0 | 3.0-4.5+ |

Descriptions of the subsurface conditions encountered are presented on the boring logs.

**Groundwater**

Free groundwater did not develop in the borings prior to backfilling. Groundwater levels at the site are expected to fluctuate over time due to variations in rainfall and other factors. Rainwater percolates through the relatively porous surface soils. On hillsides, the water typically migrates downslope in the form of seepage within the porous soils, at the interface of the soil/bedrock contact, and within the upper portions of the weathered and fractured bedrock.

## CONCLUSIONS

Based on the results of our investigation, we conclude that the project is feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the project. The primary geotechnical concerns are discussed below.

**Foundations and Underpinning**

Our test borings indicate that the project is underlain by varying thicknesses of relatively weak soils which are subject to settlement under new foundation loads, to gradual downslope creep, and to expansive soil heave. We therefore conclude that the proposed improvements should be supported on drilled piers and/or spread footings which extend into undisturbed bedrock, and which are designed to resist lateral forces imposed by creeping soils above the bedrock. Spread footings will be feasible in areas where level cuts will expose bedrock well away from slopes, while drilled piers could be used everywhere. We estimate that differential settlements of foundations designed in accordance with the recommendations contained in this report will be on the order of half an inch.

Settlement of existing foundations under current building loads should be essentially complete, although differential movement may continue as a result of soil creep and seasonal shrinking and swelling of expansive soils. Existing foundations not supported in bedrock may also experience settlement under new loads. In areas where existing foundations not supported in bedrock are subject to additional loads, it will be necessary to underpin or replace the foundations with footings or drilled piers which extend into bedrock, and which are designed in accordance with the recommendations presented in this report. If the risk of differential movement between underpinned and non-underpinned elements is not acceptable, it will be necessary to support the remainder of the house on bedrock.

## Wall Support

It will be necessary to support new retaining walls in bedrock utilizing foundations designed in accordance with this report. It will also be necessary to provide adequate backdrainage to prevent hydrostatic buildup behind the walls, and to provide non-expansive backfill to reduce lateral pressures on retaining walls.

## Slab Support

To reduce differential settlements, new slabs-on-grade should be founded on properly compacted and retained fill founded on bedrock. In order to reduce expansive soil heave, fill material located within the upper 30 inches of slab subgrade should consist of imported non-expansive Select Fill. Alternatively, structural slabs designed to span between bedrock supported elements and separated from the underlying expansive soils by an approved void-forming product may be used.

## Geotechnical Drainage

It is important that surface and subsurface water be controlled to reduce future moisture variations in the weak and expansive soils. Perimeter subdrains and slab underdrains should be provided to reduce water infiltration beneath the structures, and all roofs should be provided with gutters and downspouts. It would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable erosion resistant outlet.

## Geologic and Seismic Hazards

### Landsliding

Regional mapping by Rice (1976) does not indicate the presence of previous landsliding at the site, and a map by Davenport (1984) of slope failures resulting from the severe 1982 storms does not indicate that sliding was reported near the site at that time. In addition, we did not observe evidence of landsliding at the site.

**Fault Rupture/Ground Shaking**

The property is not within a current Alquist-Priolo Earthquake Fault Zone (EFZ), and we did not observe geomorphic features that would suggest the presence of active faulting at the site. As such, we judge that the risk of ground rupture along a fault trace is low at this site.

The San Francisco Bay Region has experienced several historic earthquakes from the San Andreas and other associated active faults. Mapped active faults (those experiencing surface rupture within the past 11,000 years) nearest the site are summarized in the following table.

| Fault System | Distance From Site (Miles/Km) | Direction From Site to Fault | MCE Moment Magnitude | Peak Ground Acceleration (g's) |
|---|---|---|---|---|
| San Andreas | 6.9 / 11.1 | Southwest | 7.9 | 0.44 |
| San Gregorio | 9.1 / 14.6 | South | 7.3 | 0.30 |
| Hayward | 11.3 / 18.2 | Northeast | 7.1 | 0.23 |
| Rodgers Creek | 18.2 / 29.3 | Northeast | 7.0 | 0.14 |

Deterministic information generated for the site considering the proximity of active faults and estimated bedrock accelerations are presented in the table above. The estimated ground accelerations were derived from mean attenuation relationship presented by Abrahamson and Silva (1997; Rock Site) and are based on the published estimated Maximum Credible Earthquake moment magnitudes (MCE) for each fault (Petersen, 1996), the shortest distance between the site and the respective fault, the type of faulting, and the estimated shear wave velocities of the on-site soils. The MCE, also referred to as the Upper Bounds Earthquake, is defined as the maximum earthquake that appears capable of occurring under the presently known tectonic framework. The deterministic evaluation of the potential for ground shaking assumes that a maximum magnitude earthquake produces fault rupture at the closest proximity to the site. This evaluation does not take recurrence intervals or other probabilistic effects into consideration.

Data presented by the Working Group on California Earthquake Probabilities (USGS, 2003) estimates the chance of one or more large earthquakes (Magnitude 6.7 or greater) in the San Francisco Bay region within the next 30 years to be 62 percent. Consequently, we judge that the site will likely be subject to strong earthquake shaking during the life of the improvements.

**Liquefaction**

During severe ground shaking from earthquakes, liquefaction can occur in saturated, loose, cohesionless sands. The occurrence of this phenomenon is dependent on many factors, including

the intensity and duration of ground shaking, soil density, particle size distribution, and position of the ground water table (Seed and Idriss, 1982). The soils encountered in our test borings contain a high percentage of fine grained materials (silt and clay). Thus, we judge that the likelihood of liquefaction during ground shaking is low.

**Densification**

During severe ground shaking from earthquakes, densification can occur in low density, uniformly-graded sandy soils above the groundwater table. We judge that significant densification is unlikely to occur in the areas explored because of the high silt and clay content of the soils encountered in the test borings.

## RECOMMENDATIONS

### Seismic Design

Based on the results of our investigation, the following seismic design criteria were developed in accordance with the *Uniform Building Code* (1997):

| | |
|---|---|
| Seismic Zone Factor (Z) | 0.4 |
| Seismic Source Type | "A" |
| Soil Profile Type | $S_C$ |
| Near Source Factor $N_a$ | 1.00 |
| Near Source Factor $N_v$ | 1.16 |
| Seismic Coefficient $C_a$ | 0.40 |
| Seismic Coefficient $C_v$ | 0.65 |

Based on the results of our investigation, the following seismic design criteria were developed in accordance with the *International Building Code* (2006):

| | |
|---|---|
| Site Class | C |
| Site Coefficient $F_a$ | 1.0 |
| Site Coefficient $F_v$ | 1.3 |
| 0.2 sec Spectral Acceleration $S_S$ | 1.500 |
| 1.0 sec Spectral Acceleration $S_1$ | 0.685 |
| 0.2 sec Max Spectral Response $S_{MS}$ | 1.500 |
| 1.0 sec Max Spectral Response $S_{M1}$ | 0.891 |

**Shoring and Underpinning**

Where excavations will extend below a 2:1 line projected down from the ground surface adjacent to existing foundations, the foundations should be underpinned. Underpinning piers should consist of drilled, cast-in-place, reinforced concrete piers, or of shored hand-excavated pit footings, designed in accordance with the criteria presented in the *Foundation Support* section of this report.

The Contractor should slope temporary excavations no steeper than 1-1/2:1, or should install shoring as excavations proceed in order to maintain lateral support. All temporary slopes and shoring should be contractually established as solely the responsibility of the Contractor, and inspection of temporary slopes and shoring is specifically excluded from our scope of work. Shoring should be designed to resist lateral earth pressures and additional surcharge loading from structures and walls as outlined in the *Retaining Walls* section of this report. Provisions should be made to allow free drainage through the shoring. Where shoring will be used as a permanent wall, the shoring should be backdrained as outlined in the *Retaining Walls* section of this report.

**Site Preparation and Grading**

Areas to be graded should be cleared of debris and deleterious material, and then stripped of the upper soils containing root growth and organic matter. The cleared materials and strippings should be removed from the site. Abandoned utility vaults, pipes, old foundations, slabs and other buried objects should be removed, and the resultant voids cleaned and backfilled as outlined below.

Except where void forms will be provided beneath structural slabs, all existing soils beneath and within 3 horizontal feet of planned interior and garage slabs-on-grade should be excavated as necessary to create level benches in bedrock. The depth and extent of required overexcavations should be approved in the field by Herzog Geotechnical prior to placement of fill or improvements.

In portions of excavations extending more than 30 inches below planned slab subgrade, the excavated fill may be replaced in lifts not exceeding 8 inches in uncompacted thickness, moisture conditioned to at least 3 percent over optimum moisture content, and compacted to between 90 and 93 percent relative compaction to within 30 inches of the proposed slab subgrade. Relative compaction refers to the in-place dry density of a soil expressed as a percentage of the maximum dry density of the same material, as determined by the ASTM D1557 test procedure. Optimum moisture content is the water content of the soil (percentage by dry weight) corresponding to the maximum dry density. Within the upper 30 inches, non-expansive Select Fill should be placed in lifts not exceeding 8 inches in uncompacted thickness, moisture conditioned, and compacted to at least 90 percent relative compaction.

All fill material should be free of organic matter. The fill material should not contain rocks or lumps larger than 4 inches in greatest dimension, and no more than 15 percent should be larger than 2 inches. The upper 30 inches of Select Fill material in and within 3 feet of proposed slabs should consist of clean well-graded soil with little or no potential for expansion. The Select Fill material should have a plasticity index of 15 percent or less, and a maximum liquid limit of 40 percent. Herzog Geotechnical should approve all imported fill prior to it being brought to the site.

All new cuts and fills should be retained with retaining walls. Backfill slopes should be constructed at an inclination no steeper than 2:1. Backfill slopes should be overbuilt, and trimmed back as necessary to expose a well-compacted surface. Routine maintenance of slope sloughing and erosion should be anticipated. Fill slopes and areas disturbed during construction should be planted with vegetation to reduce erosion. Surface water runoff should be intercepted and diverted away from fill slopes.

## Foundations

### Drilled Piers

Drilled piers should be at least 18 inches in diameter and should extend at least 8 feet into bedrock. Design pier depths and diameters should be calculated by the Project Structural Engineer using the criteria presented below. The materials encountered in the pier excavations should be evaluated by our representative in the field during drilling.

Piers should be interconnected with grade beams to support structural loads and to redistribute stresses imposed by the creeping soils. Piers and grade beams located on slopes or within 15 feet of the top of slopes steeper than 5:1, should be designed and reinforced to resist creep forces acting from the ground surface to the top of the rock, and exerting an active equivalent fluid pressure of 60 pounds per cubic foot (pcf). For piers, this pressure should be assumed to act on 2 pier diameters.

The portion of the piers extending into bedrock can impose a passive equivalent fluid pressure of 400 pounds per cubic foot (pcf) acting over 2 pier diameters, and vertical dead plus real live loads of 1000 pounds per square foot (psf) in skin friction. These values may be increased by 1/3 for seismic and wind loads, but should be decreased by 1/3 for determining uplift resistance. The portion of piers designed to impose passive pressures should have at least 7 feet of horizontal confinement from the face of the nearest slope or wall. End bearing should be neglected due to the uncertainty of mobilizing end bearing and skin friction simultaneously.

In areas where the bottom of grade beams expose expansive soils, a compressible void form product (Econo-Void or equivalent) should be provided beneath the grade beams. Expansive soils exert uplift forces on concrete overpours. Grade beams should be formed above the trench

to prevent overpours, and care should be taken to prevent overpours (mushrooming) at the tops of piers.

If groundwater is encountered, it will be necessary to dewater the holes and/or to place concrete by the tremie method. If caving soils are encountered it will be necessary to case the holes. Hard drilling or coring will likely be required to achieve the required penetration.

**Spread Footings**

Spread footings should only be used where level cuts expose bedrock located at least 7 feet from downslopes steeper than 5:1. Footings should be at least 18 inches wide, should be bottomed at least 12 inches into competent bedrock, and should extend at least 12, 18, and 24 inches below lowest adjacent finished grade for 1, 2 and 3 story structures, respectively. Footings should be stepped as necessary to produce level tops and bottoms, and should be deepened as necessary to provide at least 5 feet of horizontal clearance in rock between the portion of footings designed to impose passive pressures and the face of the nearest slope or wall. Spread footings extending into competent bedrock can be designed to impose dead plus code live load bearing pressures of 4000 pounds per square foot (psf), and total design load bearing pressures of 5000 psf.

Resistance to lateral pressures can be obtained in rock from passive pressures against the sides of footings and from friction along the base of footings. We recommend the following criteria for design:

| | | |
|---|---|---|
| Passive Pressures* | = | 400 pounds per cubic foot (pcf) equivalent fluid pressure |
| Friction Factor | = | 0.40 times net vertical dead load |

* Neglect passive pressure in the top 12 inches where the surface is not confined by slabs or pavements.

**Slab Support**

In areas where slab subgrade excavations for interior, garage and other settlement sensitive slabs do not expose bedrock, slabs should be structurally supported, or else underlain by compacted fill which is founded on bedrock as outlined previously. The upper 30 inches of compacted fill beneath slabs-on-grade should consist of non-expansive Select Fill.

Slab subgrade within living and garage areas should be sloped to drain into a 12 inch deep trench excavated in the downslope direction beneath the middle of each slab. The trenches should be lined completely with a filter fabric such as Mirafi 140N, or equivalent. A 4-inch diameter rigid-perforated PVC or ABS (Schedule 40, SDR 35 or equivalent) pipe should be placed on a 1-inch layer of drain rock at the bottom of the trench with perforations down. The trench should be backfilled with drain rock up to slab subgrade elevation. The filter fabric should be wrapped

over the top of the drain rock. The pipe should be sloped to drain by gravity to a non-perforated pipe which discharges at an approved outlet. The trench for the non-perforated pipe should be backfilled with properly compacted soil.

Interior and garage slabs should be underlain by a capillary moisture break consisting of at least 4 inches of free-draining, crushed rock or gravel (slab base rock) at least 1/4 inch, and no larger than 3/4 inch, in size. Moisture vapor detrimental to floor coverings or stored items will condense on the undersides of slabs. A moisture vapor barrier should therefore be installed over the capillary break. The barrier should be specified by the slab designer. It should be noted that conventional concrete slab-on-grade construction is not waterproof. The local standard under-slab construction of crushed rock and vapor barrier will not prevent moisture transmission through slab-on-grade. Where moisture sensitive floor coverings are to be installed, a waterproofing expert and/or the flooring manufacturer should be consulted for their recommended moisture and vapor protection measures, including moisture barriers, concrete admixtures and/or sealants.

Structural slabs should be underlain by an approved void forming product for protection from expansive soil heave. The void forms should consist of at least a 2-inch thick degradable and compressible paper product (SureVoid®, or equivalent). The capillary moisture break should be installed beneath the void form, and the moisture barrier should be carefully installed over the top of the void form.

Non-structural slabs-on-grade should be at least 5 inches thick, and should be reinforced at least with #4 reinforcing bars spaced at 12 inches on-center each way to control cracking. All slabs should be designed by the project structural engineer.

**Retaining Walls**

Retaining walls should be supported in rock on foundations designed in accordance with the recommendations presented in this report. Free-standing retaining walls should be designed to resist active lateral earth pressures equivalent to those exerted by a fluid weighing 45 pounds per cubic foot (pcf) where the backslope is level, and 60 pcf for backfill at a 2:1 slope. Retaining walls restrained from movement at the top should be designed to resist an "at-rest" equivalent fluid pressure of 60 pcf for level backfill and 75 pcf for backfill at a 2:1 slope. For intermediate slopes, interpolate between these values. Where wall backfill will be subject to vehicular loading, a traffic surcharge equivalent to 2 feet of additional backfill should also be added to walls. A minimum factor of safety against instability of 1.5 should be used to evaluate static stability of retaining walls.

The seismic stability of walls may be evaluated based on an additional uniform lateral earth pressure of 20xH psf (where H is the height of the wall in feet). The factor of safety against instability under seismic loading should be at least 1.1.

**Utility Trenches**

Trenches should be backfilled with material that is mechanically compacted to at least 90 percent relative compaction. Lift thicknesses should not exceed 8 inches in uncompacted thickness. Compaction by jetting should not be permitted. In order to prevent utility trench backfill conducting water into the expansive soils beneath the building or pavements, granular backfill should not be used beneath the building or pavements. Governmental or public utility requirements may exceed those listed above and should govern where applicable.

**Geotechnical Drainage**

Positive drainage should be provided away from structures. Runoff from the area upslope of the house should be diverted away from improvements. All roofs should be provided with gutters and downspouts. Drop inlets should be provided at low points as necessary to prevent ponding of surface water. All downspouts and surface drains should be connected to non-perforated conduits which discharge into a storm drain or at approved erosion resistant outlets well away from slopes or improvements. It would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable erosion resistant outlet. New conduit should consist of rigid PVC or ABS pipe which is Schedule 40, SDR 35 or equivalent. New and existing downspouts, surface drains and subsurface drains should be checked for blockage and cleared and maintained on a regular basis. Surface drains and downspouts should be maintained entirely separate from retaining wall backdrains, slab underdrains and foundation drains.

Foundation drains should be installed adjacent to all new perimeter foundations. Perimeter retaining wall backdrains may be substituted for foundation drains. If unacceptable moisture is noted beneath the existing structure, foundation subdrains should be provided adjacent to perimeter of the remainder of the building. The drains should consist of trenches which extend 18 inches deep, or 12 inches below lowest adjacent interior or crawl space grade, whichever is deeper, and which are sloped to drain at least 1 percent by gravity. Where foundation drains will extend below the elevation of the bottom of existing footings, the trenches should be offset 3 feet away from foundations or the foundations should be underpinned as necessary. The trenches should be lined completely with a filter fabric such as Mirafi 140N, or equivalent. A 4-inch diameter rigid perforated PVC or ABS pipe (Schedule 40, SDR 35 or equivalent) should be placed on a 1-inch thick layer of drain rock at the bottom of the trenches with perforations down. The pipes should be sloped to drain at least 1 percent by gravity to a non-perforated pipe (Schedule 40, SDR 35 or equivalent) which discharges at an approved outlet. The trench for the perforated pipe should be backfilled to within 6 inches of the ground surface with drain rock. The filter fabric should be wrapped over the top of the drain rock. The upper 6 inches of the trenches should be backfilled with compacted clayey soil to exclude surface water. The trench for the non-perforated outlet pipe should be completely backfilled with compacted soil.

Water will accumulate in depressed crawl spaces. Where water is observed in crawl spaces or where crawl spaces are depressed, crawl spaces should be graded to create a smooth surface, and covered with an approved pre-fabricated drainage material such as Mirafi Miradrain 6000. A 4-inch diameter, perforated Schedule 40 or SDR 35 pipe should be provided in a trench at the base of the crawl space. The trench should extend 18 inches deep or 12 inches below lowest adjacent interior grade, whichever is deeper, and should be sloped to drain at least 1 percent by gravity. The trench should be completely lined with Mirafi 140N filter fabric, or equivalent. The perforated pipe should slope to drain at least 1 percent to a non-perforated Schedule 40 or SDR 35 pipe which discharges at an approved outlet. The slope and trench should then be covered with reinforced gunite.

**Supplemental Services**

Our conclusions and recommendations are contingent upon Herzog Geotechnical being retained to review the project plans and specifications to evaluate if they are consistent with our recommendations, and being retained to provide intermittent observation and appropriate field and laboratory testing during pier drilling, footing excavation, slab subgrade overexcavation and backfill compaction, void form installation, wall backdrain installation, wall backfilling, and subdrainage installation to evaluate if subsurface conditions are as anticipated and to check for conformance with our recommendations. We should also be notified to observe the completed project. Steel, concrete, slab moisture barriers, underpinning, shoring, and waterproofing should be inspected by the appropriate party, and are not part of our scope of work.

If during construction subsurface conditions different from those described in this report are observed, or appear to be present beneath excavations, we should be advised at once so that these conditions may be reviewed and our recommendations reconsidered. The recommendations made in this report are contingent upon our being notified to review changed conditions.

If more than 18 months have elapsed between the submission of this report and the start of work at the site, or if conditions have changed because of natural causes or construction operations at or adjacent to the site, the recommendations of this report may no longer be valid or appropriate. In such case, we recommend that we review this report to determine the applicability of the conclusions and recommendations considering the time elapsed or changed conditions. The recommendations made in this report are contingent upon such a review.

We should be notified at least 48 hours before the beginning of each phase of work requiring our observation, and upon resumption after interruptions. These services are performed on an as-requested basis and are in addition to this geotechnical reconnaissance. We cannot provide comment on conditions, situations or stages of construction that we are not notified to observe.