STAFF REPORT
SAUSALITO CITY COUNCIL

AGENDA TITLE

Appeal of Utility Underground Variance Denial, David/Rech 199 Santa Rosa Ave.

RECOMMENDATION

Review and approve the attached draft resolution which approved the appeal and rejects the Undergrounding Committee's denial of a utility undergrounding variance.

SUMMARY

On May 3, 2010 the Undergrounding Committee considered an application for a variance from Section 18.08.020 of the Sausalito Municipal Code which requires the undergrounding of overhead (aerial) electrical and communications service lines when a panel is replaced. The applicants, Mathew David and Renee Rech currently of 208 Spencer are remodeling 199 Santa Rosa in order to make it their primary residence. The project was begun in December 2006 but encountered significant problems and challenges slowing the completion of the project. The project was re-scoped, the project was refinanced, and the original contractor was released and a new contractor was brought in to complete the project. In late March, 2010 a building inspection was called by the contractor. At that time the Building Inspector reminded the applicant of the need to place the aerial utility services underground. After evaluating the matter the applicants submitted a variance application on April 26, 2010.

The Undergrounding Committee reviewed the application and considered staff recommendation to approve the variance based upon staff"s assessment that findings of hardship could be made based upon the criteria contained within the Underground Committee Guidelines.

A motion was made and seconded to grant the applicant a variance. The Committee voted on the request. The result was two in favor of granting the variance request. Two opposed. The committee is currently comprised of four members. A tie vote is a rejection of the motion. No alternative motions were developed.

The applicant has requested the City Council consider their appeal of the Underground Committee's action. The applicant is also requesting Council authorization of a refund of the $2,587 City Council appeal fee.

Staff recommends that the City Council adopt the attached resolution approving the appeal request of the applicant. Staff makes no recommendation with regard to the applicants request for fee refund.

BACKGROUND AND PROJECT HISTORY

The applicants and their contractors are in the process of constructing a major remodel of a single family home at 199 Santa Rosa Ave. The home was originally built in 1961. The terrain is extremely steep in this area. The home is accessed from a private driveway which also serves six other homes. These homes were constructed significantly set back from the street.

Because of the terrain and the position of the homes on the lot, all of the homes served by this driveway sit at an elevation higher than the aerial utility lines that serve them.

The applicant's original contractor Canyon Construction applied for a building permit in December 2006 for the remodel of 199 Santa Rosa, a single family residence. The project had a declared valuation of $397,500. Electrical work was authorized with the issuance of Permit BEPM06-365.

The applicants indicate that their architect resigned. The original contractor was removed for performing unauthorized work which resulted unanticipated costs including repairing water damage to the home as well as delay in completing the work. The City was notified of Canyon's removal from the project on March 3, 2008. Work was reactivated with Permit BEPM07-678 with McDonald Construction in 2008. The applicants submitted new project cost information that indicates remodel costs have increased to $619,400.

The applicants also submitted Utility Undergrounding cost estimates of $63,887, $64,124, and $81,437.

Before Canyon Construction was removed from the project, the electrical panel was replaced. Submitted documents suggest that the old panel may have been the original panel installed when the home was new in 1961, was reported to be rated at 60 amps. The panel was replaced partly because it was perceived to be in poor condition and creating safety risks to the structure. The new panel has a rating of 200 amps and is in-line with current construction practices and lifestyle needs.

This panel replacement work "triggers" utility undergrounding and is defined in Section 18.08.020 of the Sausalito Municipal Code (excerpt attached). Section 18.08.04 allows for exceptions to the requirement due to hardship.

The Municipal Code does not define the term hardship. Previously the Undergrounding Committee developed guidelines to enable the determination of hardship. The City Council adopted these guidelines on February 2, 1999. A copy of the guidelines is attached. The Guidelines define hardship when the cost to underground the aerial utility services exceeds 10% of the cost of the construction triggering the undergrounding requirement.

For a period of time between February 2, 1999 and an unrecorded date in 2009 a version of the Guidelines were on the City website with a different standard for determining hardship. The standard contained in this version of the Guidelines defines hardship when the cost to underground the aerial utility services exceeded 1% of the market value of the owner occupied single family dwelling. Attempts were made to determine the origin of this website version of the guidelines. To date staff has been unable to determine the origin of the website version. As such, the website version was removed.

Variance applications are evaluated by both standards for the benefit of the Underground Committee.

Canyon Construction did not notify the owners of the City requirement for Utility Undergrounding in 2006 or early 2007. Building permit applicants are given notice of the requirement on the Building Permit Application Form. Canyon Construction was provided written notification of the requirement when they submitted a signed the Building Permit application indicating that they have read the form. McDonald Construction also overlooked the

notification when the new permit was issued in 2009. The undergrounding requirement became meaningful to the contractor and the owner in March of 2010 when the Building Inspector inquired into the status of the utility undergrounding work and then notified the contractor of the requirement when it became evident that they were unaware of the requirement.

The owner met with staff, reviewed the Underground Committee Guidelines, reviewed the Ordinance requirement and worked with Electrical subcontractor and PG&E to determine the costs to comply with the requirement. Upon consideration of these issues the applicant submitted an Underground Variance Application on April 27, 2010.

Financial Hardship Calculation

Method	Undergrounding Costs	Project Cost	Property Value	Result	Criteria	Criteria Met?
Project Cost	$63,887	$619,400		10.3%	10%	Yes
Project Cost	$64,124	$619,400		10.4%	10%	Yes
Project Cost	$81,437	$619,400		13.2%	10%	Yes
Property Value	$63,887		$1,561,702	4.1%	1%	Yes
Property Value	$64,124		$1,561,702	4.1%	1%	Yes
Property Value	$81,437		$1,561,702	5.2%	1%	Yes

A variance application is a formal request for exception to the Municipal Code requirements. In other words a grant of variance means that the property can continue to be serviced with aerial utility services.

The Underground Committee reviewed the variance application on May 3rd, 2010. The Committee discussed the variance request information, considered verbal information provided by the two applicants and their electrical contractor, and considered comments from staff. There were no other persons in the audience to support or oppose the applicants requested action.

The applicant disclosed the challenges they have experienced completing their remodel project. The challenges have two aspects, professional and personal.

On the professional side the owners discussed the problems that they had with Canyon Construction leading to the firm's removal by the owners. Adding to that the challenges of having to mitigate problems that the applicants have suggested as having arisen from the contractors actions. Correcting these problems have added costs.

Desiring to complete the project but in need of additional resources, the applicants have indicated that the project scope was changed and enlarged in order to qualify for additional financing. It appears that utility underground costs were not factored in when those actions were done. Undergrounding costs significantly alter their budget and they have indicated that they don't possess the resources to complete the remodel work and undergrounding work.

On the personal side, one of the applicants has a chemical sensitivity and a physical sensitivity to electromagnetic fields common in domestic residential alternating current electrical services. This documented medical condition has compelled the applicants to require unusual construction practices and use more costly materials. These requirements added to higher

costs for the project. These material and construction costs appear to have been factored into the refinancing that they acquired.

Committee members expressed the following points during the review:

The applicants undergrounding costs exceed 10% of the project costs. The finding can be made.

The least expensive underground facility, if constructed now, would likely be abandoned in the event that the neighborhood was undergrounded. Topography, access and locations of panels would make routing a neighborhood wide facility through the existing common private driveway (an parallel to the contour route instead of perpendicular.

The applicant should become thoroughly familiar with City requirements by reading permit documents acquired on their behalf. The applicant has had three years to become familiar with the requirement. The costs should have been included when the project was re-scoped and refinanced.

With the cost information presented it is difficult to determine if criteria are met.

The applicants are young and could develop the resources to comply with the requirement.

There are no guidelines for hardship other than financial.

The committee sought information regarding the applicant's ability to acquire additional financing to fund undergrounding. Staff believes that this point was not fully explored. The applicant's response suggested that they have reached the limit of their borrowing capability. Undergrounding Committee guidelines are silent on the matter of an applicant's ability to borrow and repay loans to fund utility undergrounding.

The project was at an important stage of construction in late April and May. Interior walls were ready to be "closed in." Doing so would make electrical modifications more difficult and costly to implement. The Underground Committee discussed the possibility of continuing the matter to allow further refinement of the application as well as consideration to discuss neighborhood undergrounding. The applicants expressed their belief that the submitted information was consistent with the format the committee demanded. While they were open to the idea of discussing utility undergrounding with their neighbors, they had fears that such efforts to coordinate a neighborhood undergrounding district would require a lot of time. They also concerned absence of consensus could delay their project indefinitely. The applicants respectfully requested the Committee take action that day.

GROUNDS FOR APPEAL

On May 11, 2010, Mathew David and Renee Rech, property owner of 199 Santa Rosa, filed an appeal of the Underground Committee's decision. The appeal lists two grounds which are summarized below in *italics*, followed by staff comments (see **Attachment** for the appeal).

Ground 1. *The cost to underground aerial utility services exceeds the standards within the Underground Committee Guidelines for hardship*

Whether evaluated using Project Cost standard or the Property Value Standard, the applicant meets the criteria for hardship. As a result of meeting the criteria for hardship, staff recommended the Committee approve the variance.

Given the terrain of the site, the location of the electric panel to the roadway (the panel is on the back face of the house as is the front entrance as the subject home is accessed from a private driveway located on the back side of the structure), the location of the utility lines in the public right-of-way, and the way that wiring was routed through the house, undergrounding costs would be high. The matter of reusing the existing internal wiring to link an undergrounded conductor to the panel was explored. PG&E staff indicated that this wiring could not be reused as it was inconsistent with PUC standards.

Some of the committee members felt that the submitted costs estimates provided inconsistent information making evaluation difficult. Staff believes this point has some merit, however complete resolution of the issue is expected to create new challenges.

Electrical contracting and bidding is not standardized. Work scopes are loosely defined. The work scoping is often an oral exercise that gets documented in a bid quote. Some contractors like to itemize in detail, others prefer less detail and in extreme offer a single "lump sum" estimate to complete requested work. Staff believes that the best way to obtain standardized comparable costs is to develop plans and specifications. However the costs to have plans prepared would be expected to create significant financial and time impacts and would not result in significant improvements of the work item definition and costing. It is believed that the creation of the current form provides an adequate if imperfect structure for allowing standardized comparison.

Staff believes there will always be challenges associated with standardizing the work scope and comparing costs between competing contractors.

Some committee members wanted to consider the applicants ability to borrow to fund utility undergrounding. Some committee members felt that the appeal was the result of the applicants error to not completely read Building permit documents thereby further causing the costs of utility undergrounding to not get factored in when new financing was secured.

Property owners ignorance of the requirement, which staff believes is a result of not reading building permit documents is the leading cause of Variance Applications. Property owners are either unwilling or unable to add the cost of this work to their debt obligations.

Some committee members appear to hold a belief that by granting the variance, the committee would indefinitely defer necessary work to underground neighborhoods. Some committee members have difficulty reconciling the duty to consider hardship determination through Variance application with their duty to promote utility undergrounding in the community.

One committee member was satisfied with the cost information submitted. One committee member was dissatisfied. Staff believes that that member, now resigned from the committee would have desired or at least accepted a motion to continue the item to enable cost information to be refined. The other committee members found other reasons beyond the application data to reach conclusions for the action they took. One committee member reached their conclusion by making a finding with regard to the criteria contained in the Undergrounding Guidelines.

Other committee members reached their conclusions using other criteria. Given that the application does not require the applicant to fully document their financial position, some committee members expressed the belief that the applicants were not completely forthright regarding financial hardship. No city development or construction application requires such disclosure leading engineering staff to believe that such demands by committee members were inappropriate. Staff believes the committee reached in inappropriate conclusion by not making findings related to the adopted Underground Committee Guidelines.

Ground 2. ***The applicant seek hardship determination for health and medical reasons.***

The Underground Committee Guidelines are silent on the matter of hardship for reasons other than financial. Some committee members were sympathetic to the applicant's physical condition but without formal policy they felt that granting a medical hardship was without policy basis.

Staff believes the committee's action on this point was appropriate. The committee could not make findings of hardship for medical reasons as they don't exist. Actions to do so could be perceived to be arbitrary.

The applicant has requested a full refund of the $2,587 Appeal Fee.

CORRESPONDENCE

The City has received no correspondence on the requested matter.
Correspondence submitted after the writing of this staff report will be posted on the City's website (http://www.ci.sausalito.ca.us) and available at the City Council public hearing.

NOTIFICATION

Notification consisted of posting the item within the City Council Agenda. Underground Committee members and the applicant were verbally informed of the City Council Hearing. Committee Members and the applicant were provided internet links to this report.

STAFF RECOMMENDATIONS

Staff recommends that the City Council review and approve the attached draft resolution which approves the appeal and rejects the Underground Committee's denial of a variance. Staff makes no recommendation with regard to the Appeal Fee refund request.

Alternatively, the City Council may:

- Reject the appeal and direct staff to return with a resolution with appropriate findings to affirm the Underground Committee action. Such alternative would obligate the applicant to underground their aerial utility services.

- Continue the public hearing for additional information.

ATTACHMENTS

1. Resolution (Draft)
2. Appeal filed by e-mail by Matt David dated May 10, 2010, Fee payment receipt dated May 11, 2010
3. Utility Underground Committee Guidelines
4. Section 18.08 of the Sausalito Municipal Code
5. Utility Underground Committee May 3rd, 2010, Staff Report
6. Utility Underground Committee minutes dated May 3rd, 2010

PREPARED BY:

Todd Teachout
City Engineer

REVIEWED BY:

Jonathon Goldman
Director of Public Works

REVIEWED BY:

Mary A. Wagner
City Attorney

SUBMITTED BY:

Adam W. Politzer
City Manager

RESOLUTION NO. ____

RESOLUTION OF THE SAUSALITO CITY COUNCIL APPROVING AN APPEAL OF THE UNDERGROUNDING COMMITTEE'S DENIAL OF A VARIANCE TO SECTION 18.08.020 REQUIRING UTILITIES SERVICE FACILITIES TO BE UNDERGROUNDED

WHEREAS, on April 26, 2010 Matthew David and Renee Rech submitted an Underground Variance Application, requesting relief from the requirement of Section 18.08.020 which requires overhead (aerial) electrical and communication service lines to be placed underground when the electrical panel is removed or relocated, and

WHEREAS, on May 3, 2010, the Planning Commission conducted a duly-noticed review of the Variance Application, considered the information contained in a related staff report, and considered comments by interested persons regarding the proposed application; and

WHEREAS, on May 3, 2010, the Underground Committee considered a motion to approve the variance, request and denied the request due to a 2 for, 2 against, no abstention tie vote; and

WHEREAS, on May 11, 2010, Matthew David filed a timely appeal of the Underground Committee's denial; and

WHEREAS, on June 15, 2010, the City Council conducted a duly-noticed public hearing on the appeal, considered oral and written testimony, and considered information in the staff report; and

NOW, THEREFORE, THE CITY COUNCIL HEREBY FINDS AND RESOLVES AS FOLLOWS:

SECTION 1. The City Council approves the appeal and rejects the decision of the Underground Committee

SECTION 2. The City Council makes the finding that the applicants, Matthew David and Renee Rech have experienced hardship as framed by Section 18.08.040 of the Sausalito Municipal Code and as defined by Underground Committee Guidelines adopted by the City Council on February 2, 1999.

RESOLUTION PASSED AND ADOPTED at the regular meeting of the City of Sausalito City Council on the 15th day of June, 2010, by the following vote:

AYES: Councilmember:
NOES: Councilmember:
ABSENT: Councilmember:
ABSTAIN: Councilmember:

_____
Jonathan Leone, Mayor
City of Sausalito

ATTEST:

_____
Debbie Pagliaro
City Clerk

APPEAL Pg 1

Todd Teachout

From: Matt David [matt@onyxworldwide.com]
Sent: Monday, May 10, 2010 10:18 AM
To: Todd Teachout
Subject: 199 Santa Rosa Avenue - Appeal
Attachments: VarianceDenial.pdf

Hi Todd,

As follow up to our May 3rd meeting with the Underground Committee, I am writing to respectfully request reconsideration by the City Council.

The reasons for our request for a variance are well documented; my wife and I remain in an undesirable position, as we are experiencing **both** a health hardship & a financial hardship. First and foremost, I fear for Renee's well-being, so having spent 4.5 years building a "healthy home" in which she can fully heal, I am appealing the Underground Committee's 2-2 split vote decision. I literally spend every day of my life working to protect and care for my wife as she deals with a debilitating illness, and I find it unconscionable that we are being asked to jeopardize her safety. We are at the final stages of a tumultuous process. We have endured 4.5 years of setbacks and in that process, have never given up on our #1 priority, that the home be an oasis where my wife can finally heal. Our "healthy home" ambition has been well documented for several years, and our project's aim is supported by the local and national building communities.

I am asking The City of Sausalito to support our goal to provide a safe haven for my wife and to recognize the dangers inherent in our unusual situation. *Michael Cantwell*, MD, MPH and Co-Lead Integrative Medicine Physician at *California Pacific* Medical Center (Renee's doctor) has expressed his concerns regarding the impact of EMF exposures on Renee's health, as shown in his letter. Stephen Scott (a nationally recognized EMF authority and our EMF consultant on the project) has written a letter discussing why the 60hz non-stop exposures from PG&E's proposed underground plan would be detrimental. We have gone to great lengths to build a EMF-safe house, and forcing us to place wiring and boxes in ways that will elevate EMF exposure would make our home uninhabitable for my wife.

Not only did Dan Passini, of the City of Sausalito Underground Committee vote to support our request for a variance, but he acknowledged that a potential EMF health threat and EMF triangulation could occur from PGE's proposed underground plan. He also was very vocal about the unreasonableness of the city forcing us to underground in our particular situation. Mr. Passini urged the other committee members to look at long term goals and cautioned the other members that forcing owners like us to go underground with laterals up long steep hills to private streets is not the proper way to underground, nor the way that the undergrounding on our private block would ever take place. Stafford Keenan of Sausalito's Underground Committee also voted to support our variance request, as he stated his concern for the Underground Committee's adjudicating on someone's serious health matters and overruling the advice of doctors and EMF experts. Mr. Keenan also stated that (even without the serious health risks) we fall within the Committee's current hardship guidelines that state *underground service should not exceed 10% of Project Value & 1% of Market Value.* He also noted that in his opinion both of these guidelines, in themselves, were enough reason to grant a variance.

Measuring the level of our financial hardship against the criterion that was presented to us prior to our Underground Committee Meeting, our costs to underground service at 199 Santa Rosa Avenue exceed 10% of Project Value & 1% of Market Value. We have demonstrated a financial hardship, and we fear that we may not be able to complete our project without City Council support of our variance. We also have several loans that will be adversely effected, which may cause us to lose our property if we do not complete.

Please let me know if we need to resubmit the packet that we provided with the details of our situation and substantiation for our request. We are experiencing an extreme financial hardship, so we are also respectfully requesting a full refund for the fees that we have paid to appeal this decision.

Thank you.
Matt

5A
11

APPEAL Pg 2

onyx

Matt David, President
3020 Bridgeway, Suite #105
Sausalito, CA 94965
(415) 331-2233 phone
(415) 331-4033 fax
(415) 577-9066 cell

5A
12

APPEAL Pg 3

CITY OF SAUSALITO

420 Litho Street · Sausalito, CA 94965
Telephone: (415) 289-4100
www.ci.sausalito.ca.us

May 4, 2010

Matt David/Renee Rech
208 Spencer Avenue
Sausalito, CA 94965

RE: Utility Undergrounding Variance Application – 199 Santa Rosa Ave.

The City of Sausalito Utility Undergrounding Committee, considered your application for a variance request at your home at 199 Santa Rosa, last night. You had requested a variance from Section 18.08.020 of the Sausalito Municipal Code, which requires electrical and communication service lateral services to be undergrounded when the panel is replaced or relocated. Your panel was replaced and upgraded to a higher load rating during the remodel of your home.

A motion was made to approve the variance. The results of the vote was two in favor (Passini, Keegin) and two against (Lynne, Mastrangelo). The Utility Undergrounding Committee is comprised of four appointed committee members, currently. A fifth position is vacant. Committee member Keegin, also sits on the Sausalito Planning Commission and is liaison to that body. With a 2-2 vote on a four member committee, the motion was not approved. The committee did not grant you a variance.

You will need to underground your electrical and communication services in order to comply with the Municipal Code. Alternatively, you may appeal the Committee's action to the City Council. The fee for an appeal to the City Council is $2,587. An appeal needs to be filed with the Public Work/Community Development Department window within 10 business days. In other words your appeal must be in City Offices by close of business (5:00PM) on May ~~24~~ 18th, 2010.

Should you have questions about this notification, feel free to contact me by e-mail at tteachout@ci.sausalito.ca.us or (415) 289-4111.

Sincerely,

Todd Teachout
City Engineer, staff to the Utility Undergrounding Committee

TT:tt

APPEAL Pg 4

CITY OF SAUSALITO-PL
420 LITHO ST
SAUSALITO, CA 94965

City of Sausalito
Community Development Dept
420 Litho Street,
Sausalito, California 94965

Tuesday May 11, 2010 4:24 PM
Receipt No.0081276

FEEDPW	
APPEAL TO CITY COUNCIL FEE	2,587.00
Total	2,587.00
Payment: Check	0.00
Cash:	0.00
Payment: Other	2,587.00
Type: CR CARDS	
Change:	

Customer: MATT DAVID
199 SANTA ROSA AVENUE
SAUSALITO, CA 94965
Cashier: DSMI
Station: CDD

TOTAL $2587.00*

OK per Matt David
to charge over the phone.
DRS

SA
14

APPENC Pg 5

CITY OF SAUSALITO
MASTER FEE SCHEDULE

PUBLIC WORKS DEPARTMENT / ENGINEERING DIVISION FEES

Revised / Restated by Resolution No. 4957
June 24, 2008

	Current Fees
Administrative Processing	10% of Consultant Cost
Address Change Letter	$150
Amendments to Ordinances	$4,610
Appeals - Director of Public Works/City Engineer/Floodplain Administrator	$765
Appeals to City Council	$2,587
Assurance/Insurance Form Review (Non-standard forms)	$150/hr
Certificate of Compliance	$2,651
City Maps - 24 x 36	$20
Clean up Deposit	$100
Collection Service Fee	Actual cost to the City
Consultant Preparation	time and materials basis
Construction Impact Fee	0.85% of valuation plus $5/CY surcharge
Custom Maps	$385
Duplication of Records	labor + photocopying
Encroachment Permits	
Simple Utility	$423
Major Utility	1% approved estimate or bid
Short Term	$154

IN EFFECT
AS OF 6/7/2010

UNDERGROUND COMMITTEE GUIDELINES
(Adopted by Sausalito City Council on February 2, 1999)

Undergrounding Requirements

1. In the case where only an amperage upgrade (i.e. 60 to 100 Amp), or fuse to circuit breaker is requested, upgrade may be done without further undergrounding provided that provision is made to facilitate future undergrounding at the service termination by installing a meter socket and enclosure designed for overhead and underground service entry. This will apply to owner occupied residences as well as single family and multi-family rental properties.

2. The obligation to underground all overhead wires extends to:

a) remodeling within three years of the completion of relocation or upgrade of service;or

b) relocating or upgrading service within a three year period of completion of a remodeling project; or

c) performing a series of small remodeling projects without undergrounding within a three (3) year period 9f a hardship exception being granted. If subsequent remodeling is undertaken within three (3) years of the original remodeling, the total cost of remodeling during the preceding three (3) year period shall be considered in determining whether the cost of undergrounding exceeds the 10% hardship exception threshold.

NOTE: Section 2 (above) is suspended pending UG Ordinance adoption.

Hardship Exception

1. A hardship exception will be considered if the cost to underground exceed, 10% of the cost of the proposed construction in owner-occupied single family dwellings.

2. A hardship exception will be considered in a duplex residential property if one unit is owner occupied.

3. No hardship exception will be considered in rental property with three or more units or in commercial property.

4A 5A
10 17

UNDERGROUNDING COMMITTEE GUIDELINES
ADOPTED BY CITY COUNCIL 2/2/1999

Special Conditions

1. In all cases where an exception is approved, applicants shall agree to participate in a future underground utility district in conformance with the General Plan for utility undergrounding in the City of Sausalito.

2. Recipients of hardship variances shall install a service termination meter socket and enclosure designed for overhead and underground service entry.

Note: For the purpose of SMC Chapter 18.08 and these Guidelines certain terms, phrases, words and their derivatives shall be construed as specified in the most recent SMC adopted-construction codes where specific definitions are provided. Where terms are not defined, they shall have their ordinarily accepted meanings within the context with which they are used. *Webster's Third New International Dictionary* of *the English Language, Unabridged,* copyright 1986, -shall be considered as providing ordinary accepted meanings.

4A/5A
11 18

CURRENT

Chapter 18.08

UNDERGROUND ELECTRICAL WIRING AND FACILITIES

Sections:

18.08.010 Findings and determination. The city council finds and determines that the public safety and community aesthetics require that facilities and wires for the extension of existing facilities for the supply and distribution of electrical energy and service, including communication service, shall be placed underground in order to promote and preserve the health, safety and general welfare of the public and to assure the orderly development of the city. (Ord. 1077, 1992: Ord. 851 §1, 1974.)

18.08.020 New extensions of utility facilities to be underground. It is required that:

A. All new extensions of existing utility distribution facilities (including, but not limited to, electric, communication, and cable television lines), hereafter constructed or installed in the city shall be placed underground.

B. All electric and communication service laterals, including cable television service, to any new residential or commercial building or structure, or to any residential or commercial building or structure or utility services being remodeled, when such remodeling requires the relocation or replacement of property owner's main electrical service equipment, shall be placed underground from the main service facility within such building or structure, to a location designated by the supplying utility, in accordance with the supplying utility's rules, regulations, and tariffs on file with the California Public Utilities Commission. A property owner shall be responsible for compliance with this section and shall make the necessary arrangements with the public utilities involved. The undergrounding committee may grant exceptions from this requirement where the undergrounding committee finds that undergrounding of utility service laterals will cause unnecessary or unusual hardship.

4A 5A
13 19

CURRENT

C. When the main electrical service is undergrounded, all other electrical, communication service laterals and cable television service laterals shall also be undergrounded.

D. Wires, excluding utility's overhead service drops, attached to exterior surfaces of structures by means of brackets or other means and/or between buildings or to private poles and tree-mounted lights, etc., shall be undergrounded when the main electrical service is undergrounded.

E. Services to undergrounded facilities shall themselves be underground in such a fashion as to avoid additional poles or transformers thereon.

F. It will be the responsibility of the applicant for electric communication or similar or associated service to make the necessary arrangements with the utility companies involved for the underground installation of wires and facilities required for such new extension and/or service, all in accordance with applicable rules, regulations, and tariffs of the respective utility or utilities on file with the California Public Utilities Commission.

G. Pole mounted transformers shall not be used for new service installations to:

1. Three phase loads;
2. Loads requiring a transformer installation of 75 KVA or larger.

H. Additional poles, location of new transformers and increased height of existing poles shall be reviewed and approved by the director of public works who shall notify the undergrounding committee of the request upon receipt of the request. (Ord. 851 §2, 1974).

18.08.030 Exceptions. This chapter shall not apply to the following types of facilities:

A. Any temporary municipal equipment or facilities installed under the supervision of and to the satisfaction of the city engineer;

B. Poles or electroliers used exclusively for street lighting but excluding the services leading to them;

C. Poles, overhead wires, and associated overhead structures used for the transmission of electric energy at nominal voltages in excess of thirty-four thousand five hundred volts;

D. Antenna-associated equipment and supporting structures used by utility for furnishing communication services;

E. Equipment appurtenant to underground facilities such as surface-mounted transformers, pedestal-mounted terminal boxes, meter cabinets and concealed ducts;

F. Temporary poles, overhead wires and associated overhead structures used or to be used in conjunction with construction projects to provide temporary service. (Ord. 851 §3, 1974).

5A 4A 4

CURRENT

18.08.040 Application for exception due to hardship. Where the enforcement of the provisons of Section 18.08.020 would result in undue hardship, application for exception from the provisions thereof may be made in the following manner:

A. Written application shall be filed with the director of public works;

B. Such application shall include all information necessary to properly apprise the director of public works of the circumstances existing which requires such exception;

C. The director of public works shall consider the application and shall, within fifteen days after the filing of such application, submit the same to the undergrounding committee for action within forty-five days after filing with the director of public works. Any action taken by the committee may be appealed to the city council. (Ord. 851 §4, 1974).

18.08.050 Existing facilities. The provisions of Section 18.08.020 shall not prohibit the maintenance and operation of existing overhead facilities nor prohibit the installation of overhead service lines to facilities already served by at least one overhead utility service nor prohibit the connection of underground service lines to existing overhead utility distribution equipment. The utility may continue to maintain, repair, replace and reinforce any facility or structure in order to maintain the integrity of any facility or structure existing on or before the effective date of the ordinance codified in this chapter. (Ord. 851 §5, 1974).

18.08.060 Undergrounding committee created--Purpose. For the purpose of administering the provisions of this chapter, an undergrounding committee is created consisting of five residents of the city, one of whom shall be a member of the design review board. All members of the undergrounding committee shall be appointed by the mayor with the concurrence of the city council for staggered terms of three years. (Ord. 1042 §1, 1988: Ord. 851 §6, 1974).

18.08.070 Penalty for violation. Any person convicted of violating the provisions of this chapter shall be guilty of an infraction and upon conviction thereof shall be punished by a fine not to exceed one hundred dollars. Such person shall be deemed guilty of a separate offense for each and every day during any portion of which any violation of the provisions of this chapter is committed or continued or allowed to continue by such person and shall be punishable as provided in this chapter. (Ord. 851 §7, 1974).

4A 5A 21 15

STAFF REPORT

SAUSALITO UTILTY UNDERGROUNDING COMMITTEE

AGENDA TITLE:

Undergrounding Variance Request – 199 Santa Rosa

RECOMMENDED MOTIONS:

1. Motion to grant variance request

DISCUSSION

Matt David and Renee Rech, owners of 199 Santa Rosa are requesting a variance from Section 18.08.020 of the Sausalito Municipal Code which requires property owners to place electrical and communication sevices underground.

The applicant operates a promotional marketing and sourcing company within the City called Onyx Worldwide.

Mr. David contacted the City Engineer on April 6, 2010 in response to notification from Building Inspector Kenneth Henry about the electrical panel. The property, originally built in 1960, had an electrical panel that was dangerous. The owner's indicate that the panel was upgraded without the owner's knowledge.

A review of the Building Permit record found that permits were issued or being considered as follows:

Description	Permit No.	Valuation
Remodel	BEPM07678	$397,500
	Total	$397,500

The scope of the permit included building, electrical, plumbing and mechanical elements. The applicant personally applied for and signed the Building Permit Application, providing evidence of being notified of the Utility Undergrounding requirement, in late 2006. The meaning of the requirement appears to have become clear in the last month.

The property owner supplied Variance Application information. It is attached.

Two estimates were provided

	Description	Valuation
Estimate No. 1	Jean Paul Fisher, Inc.	$64,124
Estimate No. 2	McDonald Construction	$81,437
3	L.J. Const	$63 887

10.3% PC
4.1% PV

The Marin County Assessor record indicate a property value of $1,561,702. The property value was determined in 2009.

Muni Codes section 18.08.020B requires electrical services to be undergrounded when the main electrical panel is replaced. Muni Code section 18.08.040 allows exceptions to the requirement due to hardship. Section 18.080.050 allows for maintenance of existing facilities. The City Website had posted Underground Committee Guidelines with the definition that hardship is when the cost to underground exceeds 1% of the market value of the property. Other guideline documents suggest hardship can be defined when the cost to underground exceeds 10% of the project value.

Financial Hardship Calculation

Method	Undergrounding Costs	Project Cost	Property Value	Result	Criteria	Criteria Met?
Project Cost	$64,124	$619,400		10.4%	10%	Yes
Project Cost	$81,437	$619,400		13.2%	10%	Yes
Property Value	$64,124		$1,561,702	4.1%	1%	Yes
Property Value	$81,437		$1,561,702	5.2%	1%	Yes

The applicant identifies several reasons to support their request:

1) The Panel was replaced because it was unsafe – the work was maintenance driven
2) Overall challenges with the entire project – a small remodel turned into something unanticipated
3) Health concerns from EMF(electrical fields) and Chemicals – this criteria has driven up project cost and limit alternatives for utility placement
4) Undergrounding cost hardship – costs to underground are above reasonable cost targets
5) Concern about conduit trenching destabilizing the slope
6) Site is steep – owners concerned about risks to workers if undergrounding is done
7) Panel upgraded without the owner's knowledge
8) Code Conflicts

The applicant provided current information about the construction costs. This current cost information is different than the amount disclosed in the original permit application in 2006. The applicant has explained that the project scope has changed greatly as a result of contractor problems, additional design review requirements and cost to source building materials that don't cause chemical reactions. With the current cost information the applicant meets hardship criteria within the Undergrounding Variance Guidelines.

The undergrounding work scopes provided with the estimates seem complicated. A simpler work scope may have lower costs, if feasible. Staff prepared a illustration about an alternative and simpler work scope. Staff submitted this graphic with a request to PG&E regarding the requirements for routing an underground lateral to the home. As of report date, a response has not been provided. If internal building wiring and within-building lateral routing facilities can be reused, there may be opportunity to reduce costs.

The applicant has provided evidence from a medical professional regarding the property owner's sensitivities to chemicals and EMF radiation. This letter provides justification for the applicants need to use unconventional and more expensive materials in the remodel leaving little for utility undergrounding. The applicants desire to protect themselves from these exposures has created a significant cost impact. The variance guidelines are silent on the matter of hardship as a result of health related impacts.

The application report discloses little quantitatively about the EMF levels they need to achieve to prevent reactions. The applicant did indicate that the EMF radiation patterns limit where undergrounded utility lateral lines can be routed. Staff did a search on the internet and found information from Southern California Edison and a user created self-help site on protecting against EMF (PG&E has guidelines from 1994 for minimizing EMF from Transmission lines. These guidelines have limited application in this matter). The standard appears to be radiation exposure in excess of 2 milligauss. A Gauss is a unit of magnetic force. No exposure time standard is established. The owners have hired special inspectors to verify wiring system installation will keep EMF levels low. Staff does not know if measurements have been made or what they might be. The usual process would be to accept the opinion of a professional on the matter. The applicant has submitted a medical statement. Staff believes that this statement is sufficient evidence of the need for the EMF protected home and that the owner is taking the necessary steps to keep EMF levels low.

The above ground power lines along Santa Rosa do not create view impacts to residents in the neighborhood. Undergrounding the lateral service would provide no substantive benefit from a view improvement standpoint. In conversations with Electricians evaluating the situation they have indicated that the electrical power quality is not high. Surges and power fluctuations occur often and can damage electrical equipment and appliances. Undergrounded utilities may improve the power quality, though the single lateral undergrounding is not expected to improve power quality significantly.

The applicant identifies other factors about the challenges of utility undergrounding. Staff believes these challenges are regular and conventional for this City, though compared to other locations could be expected to result in higher costs to execute a lateral service undergrounding work scope. Staff believes that the impacts from risk to workers, from a landsliding or increased erosion risk are less than significant.

The project is at a state where decision on utility undergrounding is needed and requested. The applicant has described numerous challenges from a cost standpoint and from a delay standpoint. The property owners are eager to move past these challenges and complete their home. A denial of the applicants variance request would likely extend the project time further.

RECOMMENDATION

Hardship Findings can be made per current UGC Guidelines and based on the applicant provided information. Staff recommends that the Committee approve the variance application.

Alternatively, the committee could:

1) Continue the item to obtain additional information, or
2) Deny the application upon making findings for denial.

ATTACHMENTS

Application
Application Report
Building Permit Record
Assessor Record
Excerpt from So. Cal. Edison EMF Guidelines
Excepts from website on EMF Protection

PREPARED BY:

Todd Teachout, City Engineer

RECEIVED

APR 27 2010

CITY OF SAUSALITO
COMMUNITY DEVELOPMENT

CITY OF SAUSALITO
420 LITHO STREET
SAUSALITO CA 94965
PH: (415) 289-4100 / FAX: (415) 339-2256 / www.ci.sausalito.ca.us

UNDERGROUND VARIANCE APPLICATION

Owner Information

Date: 4/26/10

Owner Name: Renee Recht / Matt David

Owner Signature: [signature]

Owner Mailing Address: 208 Spencer Ave. Sausalito CA 94965

Telephone Numbers: 415.244.2864 / 415.577.9066.

Site Address: 199 Santa Rosa A Sausalito, CA. 94965

Reason Owner claims hardship as a result of the requirement to underground

Please attach narrative, including a description of the remodeling project and provide a cost estimate for this work.

Cost Estimate Summary

Remodeling Project Cost Estimate: ~$600K (trying to get lower) — over $150K of this is remediation of damages from prior contractor

Undergrounding Cost Estimate No. 1: $64,124

Undergrounding Cost Estimate No. 2: $81,437

More details in full report supplied

Property Information

Project Address: 199 Santa Rosa Avenue, Sausalito, CA. 94965

Zoning of Property: Residential Present Use of Property: Under Construction

Use of Property after remodel: Home

Current Property Value: $ 1,365,000 Is the Property owner-occupied? under construction

Does Property generate income in any part? No

Utilities Information

PG&E Contact Phone#: 415.257.3384 Fee: $ 2500-4500 Estimate (although PGE states they can't give Firm Estimate without $2K Deposit)

SBC Contact Phone#: Fee: $ N/A

Cable TV connection fee: (if not already undergrounded) $ N/A

FIRST COST ESTIMATE

Contractor and Cost Information

Contractor Name: Jean Paul Fisher Inc

Contractor License# 865403 Phone Number 925.408.7424

Valuation of Undergrounding Project $ 64,124

Contractor's Signature Jean Paul Fisher

Cost Estimate

To consider the variance request it is necessary to evaluate the cost impacts to the applicant. The table below is an example of work items that may be needed to perform undergrounding construction. Please provide construction cost estimate using the table below or by providing a separate estimate sheet. Add any additional work items as necessary.

Undergrounding Work Cost Estimate

Item Description	Quantity	Unit	Unit Price	Total Price
Trench Maverick (See Bid)		Linear Feet	$29,800	$29,800
Conduit	300	Linear Feet	9.54	$2862
Conductor		Linear Feet	4000	$4000
Panel	1	Each	225	$225
Structures (Pull Boxes, etc)	2	Each	75	$150
Traffic Control	1	Job	Lump Sum	
PGE	1	Job	$4500	$4500
Stairs (MCD) (See BID)	1	→	→	$22,587
(* Boring into Rock may cost more than estimated)			Total Cost	$64,124

Total Remodel or new Construction Costs $619,000 (trying to get this Number Down)
(See attached Remodel BID)
(over $150,000 of these costs were for water damage & MOLD remediation to fix damages from previous Contractor Negligence. Owners preparing for lawsuit.)

5A 28
5A/4

Please attach an itemized contractors estimate for overall construction costs. This estimate can exclude those items covered under the Undergrounding Work Cost Estimate.

Please attach all supporting documents

(See Breakdown in Report)
of all costs

5A
29
5A
5

SECOND COST ESTIMATE

Contractor and Cost Information

Contractor Name: McDonalo Construction

Contractor License# 861427 Phone Number 510-772-7906

Valuation of Undergrounding Project $ 81,437

Contractor's Signature [signature]

Cost Estimate

To consider the variance request it is necessary to evaluate the cost impacts to the applicant. The table below is an example of work items that may be needed to perform undergrounding construction. Please provide construction cost estimate using the table below or by providing a separate estimate sheet. Add any additional work items as necessary.

Undergrounding Work Cost Estimate

Trenching per MCD see attached

Item Description	Quantity	Unit	Unit Price	Total Price
Trench		Linear Feet		
Conduit		Linear Feet		
Conductor		Linear Feet		
Panel	1	Each		
Structures (Pull Boxes, etc)		Each		
Traffic Control	1	Job	Lump Sum	
			Total Cost	

Electric per Forrest see attached

See * attached Breakdown of costs

Total Remodel or new Construction Costs $619K (see attached Remodel Bid)

Please attach an itemized contractors estimate for overall construction costs. This estimate can exclude those items covered under the Undergrounding Work Cost Estimate.

this is only an estimate. Still trying to get # down. (over $150,000 of these costs were for water damage & mold remediation to fix damages from previous contractor's negligence owners preparing for lawsuit)

Please attach all supporting documents

5A 6 5A 30

McDonald Construction & Development Inc.
5950 Margarido Drive
Oakland, CA 94612-4966
510-550-4966
Fax 510-380-0670
License # 861427

April 27, 2010

Summary of Costs for Electrical Underground work at 199 Santa Rosa Ave, Sausalito CA

Trenching – MCD - $32,410
Electrical - Forrest Electrical - $21,940
PGE Estimate - $4,500
Staircase - $22,587

Total costs estimated at: $81,437

Please note cost that's not included or may exceed –
- Landscape costs not included
- Trenching cost may exceed due to the rock/limestone wall surrounding pole and on the hillside.

GA 31

McDONALD
CONSTRUCTION AND DEVELOPMENT

5950 Margarido Drive
Oakland, California 94618
T: 510-550-4966
F: 510-380-0670
License Number: 861427

overall

EXHIBIT 2, BUDGET

Project Cost Estimate

Prepared for: Matt David and Renee Rech
Project: Sausalito Purehouse
199 Santa Rosa
Sausalito, CA
Prepared by: Michael McDonald/Joseph Remick
Date: August 30, 2009 - revised

	Estimated General contractor costs	Estimated Subcontractor costs	Total estimated contractor costs
Division 1: General Requirements			
• **Engineering and Permits**			
City Permit Fees, Reprographics and Postage Expenses			$0
Architecture and Engineering Fees			$0
Special Inspections			$0
Staking			$0
• **General Contractor Fee**			
General contractor Fee: partnership assistance/clerical / bookkeeping/contracts/ etc	$100,000		$100,000
Site Superintendent/Project Manager	$75,000		$75,000
General Contractors Liability Insurance	$9,000		$9,000
Design Services - Detail Revisions / Value Engineering/construction administration			$0
Healthy Home Consultant			$0
• **Jobsite Expenses**			
Job trailer/office	$0		$0
Temporary toilet, fence - National Equipment Rental	$0		$0
Labor - Mobilize and Procure	$0		$0
Scaffolding: Set-up and Breakdown	$0		$0
Clean up/Misc. materials/General Conditions/rental equipment	$0		$0
Cleaning and Hauling	$0		$0
Construction Power			$0
Tree Removal			$0
Tree Protection			$0
• **Erosion control**			$0
• **Utility Hook-up Fees**			
Municipal Water and Sewer			$0
PG&E gas and electric			$0
Cable TV / Internet			$0
Telephone			$0
• **Marketing and Promotion expenses**			
Web design and upkeep			$0
Photography and video			$0
Jobsite Sign			$0
Division 1: Subtotals	$184,000	$0	$184,000
Division 2: Site Work			
• **Foundations**			
Initial demo, storage, security, site protection, set - up (included waterproofing and drainage)		$0	$0
Foundation Waterproofing and Perimeter drainage install		$0	$0
• **Site Excavation**			
Upgrade Utility Lines		$0	$0
• **Landscape Construction**			
Area drain system installation and materials		$0	$0
Landscape/Hardscape: pots, plants, trees, irrigation, misc.		$0	$0
Division 2: Subtotals	$0	$0	$0
Division 3: Concrete and Structural Reinforcement Work			
• **Foundation Concrete**			
Piers, Stemwalls, footings		$0	$0
• **Site Concrete**			
concrete flat work - slabs, pads, etc...		$0	$0
driveway resurfacing		$0	$0
Retaining walls		$0	$0
Site Staircases		$0	$0
Division 3: Subtotals	$0	$0	$0
Division 4: Masonry			
• **Decorative Concrete**			
Concrete or plaster Platform - Master Bath		$5,000	$5,000
Concrete Ledge - Living Room		$3,000	$3,000
• **Quartz Countertops**			
Counter surface - Kitchen Counters	$0		$0
Countersurface - Master Bathroom	$0		$0
Countersurface - Kids Bathroom	$0		$0
Countersurface - Downstairs Bathroom	$0		$0
Division 4: Subtotals	$0	$8,000	$8,000
Division 5: Metals			
• **Structural Steel**			
Structural Steel components			$0
Misc. Metals, hold downs, strong walls, straps, etc.			$0
• **Decorative Metal/glass**			
Interior stair handrail wall mounts			$0
Exterior guardrail material and install		$18,000	$18,000
Metal channel and drain at living room planter		$2,000	$2,000
Division 5: Subtotals	$0	$20,000	$20,000
Division 6: Wood and Plastics			
• **Mold remediation**			
Ice-blast mold remediation		$15,000	$15,000
• **Structural Framing**			

5m
5/1 32
9

COMPLETE REMAINING STRUCTURAL FRAMING INCLUDING INTERIOR STAIRS TO LOWER LEVEL		$24,750	$24,750
• **MISC CARPENTRY INTERIOR AND EXTERIOR - SEE DETAILED ESTIMATE**		$40,000	$40,000
• **MISC CARPENTRY MATERIALS INTERIOR AND EXTERIOR - SEE DETAILED ESTIMATE**		$12,700	$12,700
• **CUSTOM CABINETRY**			
BULTHAP KITCHEN CABINETS			$0
REMAINING BATHROOM CABINETS AND POTENTIAL BUILT-INS			$0
FINISH HARDWARE FOR REMAINING CABINETRY- ESTIMATE			$0
DIVISION 6: SUBTOTALS	$0	$92,450	$92,450
DIVISION 7: THERMAL AND MOISTURE PROTECTION			
• **ROOFING AND GUTTERS**			
EXISTING ROOF DEMOLITION, RE-FRAME AND RE-SHEET ROOF		$17,250	$17,250
MEMBRANE ROOFING		$17,500	$17,500
ARCHITECTURAL BREAKMETAL FLASHINGS FABRICATION		$7,000	$7,000
DOWNSPOUTS - FABRICATION AND INSTALLATION	$0		$0
• **SIDING**			
WRAP HOUSE AND INSTALL SIDING		$23,960	$23,960
INSTALL FASCIA AND SOFFIT FINISH	$0		$0
• **INSULATION**			$0
DENIM INSULATION		$15,000	$15,000
LABOR: INSULATION ASSIST, CAULKING, SEALING, ETC	$0		$0
DIVISION 7 : SUBTOTALS	$0	$80,710	$80,710
DIVISION 8 : DOORS AND WINDOWS			
• **WINDOWS & EXTERIOR DOORS:**			
EXTERIOR DOOR AND WINDOW PACKAGE			
INSTALL EXTERIOR DOOR AND WINDOW PACKAGE		$7,540	$7,540
CUSTOM ENTRY DOOR		$3,000	$3,000
SKYLIGHTS AND/OR MONITORS		$6,500	$6,500
• **INTERIOR GLAZING AND DOORS**			
MIRRORS		$1,000	$1,000
INTERIOR DOORS - BY TIM'S WOODSHOP		$9,000	$9,000
DOOR HARDWARE		$3,500	$3,500
DIVISION 8 : SUBTOTALS	$0	$30,540	$30,540
DIVISION 9 : FINISHES			
• **INTERIOR FINISHES**			
SHEETROCK, TAPE, MUD, SAND - LABOR AND MATERIALS		$20,000	$20,000
LIVING PLASTER - INTERIOR LIVING ROOM WALL, EXTERIOR WALL FEATURE AT DECK, MASTERBATHROOM		$6,500	$6,500
MASTER BATH TILE - CONCRETE TILES (MATERIAL ONLY)	$0		$0
REMAINING TILE (MATERIAL ONLY)	$0		$0
LABOR - TILE INSTALL		$13,200	$13,200
• **FLOORING**			
WOOD FLOORS, STAIRS TREADS AND RISERS		$25,000	$25,000
WOOD FLOORING AND STAIR INSTALLATION		$9,000	$9,000
• **EXTERIOR FINISHES**			
PRE STAIN WOOD SIDING / PICK UP STAIN		$5,000	$5,000
INSTALL IPE DECKING		$18,750	$18,750
• **PAINT: EXTERIOR AND INTERIOR**		$18,000	$18,000
DIVISION 9 : SUBTOTALS	$0	$115,450	$115,450
DIVISION 10 : SPECIALTIES			
• **MAILBOX AND HOUSE NUMBERS**			
• **GLASS SHOWER SURROUND AND DOOR**			
OWNER'S BATH		$3,800	$3,800
OTHER BATHS		$2,200	$2,200
• **BATH/SHOWER ACCESSORIES**			$0
DIVISION 10 : SUBTOTALS	$0	$6,000	$6,000
DIVISION 11 : EQUIPMENT			
• RESIDENTIAL APPLIANCES			$0
• INSTALLATION OF ALL APPLIANCES			$0
DIVISION 11 : SUBTOTALS	$0	$0	$0
DIVISION 12 : FURNISHINGS			
• **WINDOW TREATMENTS**			
MOTORIZED SHADES			$0
NON-MOTORIZED WINDOW TREATMENTS			$0
DIVISION 12 : SUBTOTALS	$0	$0	$0
DIVISION 15 : MECHANICAL AND PLUMBING SYSTEMS			
• **HEATING / COOLING SYSTEM**			
DESIGN BUILD SYSTEM BY HVAC CONTRACTOR ALREADY UNDER CONTRACT		$20,000	$20,000
• **FIRE SPRINKLER SYSTEM**		$8,000	$8,000
• **PLUMBING**			
ROUGH PLUMBING: WATER, GAS, WASTE, VENT, AND TRIM OUT		$24,500	$24,500
PLUMBING FIXTURES			$0
REMAINING FIXUTRES TO PURCHASE			$0
• **SANITARY SEWER**			
SEWER LINE INSPECTION		$500	$500
DIVISION 15 : SUBTOTALS	$0	$53,000	$53,000
DIVISION 16 : ELECTRICAL SYSTEMS			
• **ELECTRICAL**			
ROUGH ELECTRICAL AND TRIM OUT (STANDARD CANS, DIMMERS, SWITCHES, UNDERCABS) / SECURITY / AV		$28,500	$28,500
• **PV SOLAR**			$0
• **SPECIALTY ELECTRICAL FIXTURES: LIGHTS, FIXTURES, FANS, ETC**			
SPECIALTY FIXTURES, LANDSCAPE LIGHTING, ETC..		$0	$0
• **TECHNOLOGY AND COMMUNICATIONS**			
DOORBELL / INTERCOM SYSTEM/TELECOM		$750	$750
WHOLE HOME AUTOMATION SYSTEM: LIGHTING, A.V, SECURITY, ETC..		$0	$0
DIVISION 16 : SUBTOTALS	$0	$29,250	$29,250

ESTIMATE SUMMARY

	ESTIMATED GENERAL CONTRACTOR COSTS	ESTIMATED SUBCONTRACTOR COSTS	TOTAL ESTIMATED CONTRACTOR COSTS
TOTAL MATERIALS, SUBCONTRACTORS, PROJECT MANAGEMENT, DIRECT LABOR, OVERHEAD/PROFIT:	$184,000	$435,400	$619,400

trying to get lower

THIRD
~~SECOND~~ COST ESTIMATE

Contractor and Cost Information

Contractor Name: L.J. Construction

Contractor License# 771158 Phone Number 707-823-0247

Valuation of Undergrounding Project $ 63,887

Contractor's Signature

Cost Estimate

To consider the variance request it is necessary to evaluate the cost impacts to the applicant. The table below is an example of work items that may be needed to perform undergrounding construction. Please provide construction cost estimate using the table below or by providing a separate estimate sheet. Add any additional work items as necessary.

Undergrounding Work Cost Estimate

Item Description	Quantity	Unit	Unit Price	Total Price
Trench LJ Construction (See BID)		Linear Feet	$ 25800	$25800
Conduit		Linear Feet		
Conductor Chasov		Linear Feet		
Panel Electrical	1	Each	$ 1,000	$1,000
Structures (Pull Boxes, etc)		Each		
Traffic Control	1	Job	Lump Sum	
PGE Estimate	1	Job	$ 4500	$4500
Stairs (MCO) (See BID)			→	$22,587
(* Boring into Rock may cost more than estimated)			Total Cost	$63887

Chasov Electrical $11,000

Total Remodel or new Construction Costs $619,000 (See attached Remodel BID & Report)

Please attach an itemized contractors estimate for overall construction costs. This estimate can exclude those items covered under the Undergrounding Work Cost Estimate.

Please attach all supporting documents

(over $150,000 of these costs were to fix & Remediate Damages from previous Contractor Negligence)

Chasov .com
Electrical, Voice & Data
Construction Communication
1546 Portola Dr. San Francisco CA 94127

Independently Rated Highest in Quality

GOOD SERVICE GUIDE San Francisco

BBB ACCREDITED BUSINESS

Estimate

Date	Estimate #
4/22/2010	5962

Phone # 415-682-7582 Fax # 415-661-3528

Name / Address	Job Site
Matt David 199 Santa Rosa Ave. Sausalito, CA 94965	

Project

Item	Description	Qty	Rate	Total
	Installation of new electrical service at 199 Santa Rosa Ave in Sausalito.			
Permit	Electrical Permit and time to meet an inspector.		800.00	800.00
Electrica...	Installation of Service equipment in specified location, Install new connection from sub panel to new service. Replacement of an existent 200AMPS meter main with 40 spaces sub panel. Installation of grounding system. Material and equipment is included.		7,600.00	7,600.00
Electrica...	Installation of 3" and 2" PVC conduit in provided trench, install underground splice boxes for power and telephone. material and equipment is included. Earth work by others.		2,600.00	2,600.00

Total $11,000.00

5A
35

UNDERGROUND VARIANCE APPLICATION SUBMITTAL CHECKLIST

☑ Ensure the Application is completely and clearly filled out.

☑ Supply construction estimates from two different contractors.

☑ Provide a plan with dimensions for existing and proposed improvements showing:
- Structure.
- Electrical panel.
- All utility poles serving property (and those poles within 150ft of any portion of the property).
- Direction of lines coming off of the utility pole.
- Edge of pavement of the street adjacent to the property.
- Show all retaining walls, trees or any other significant obstacle/structure.

☑ Include photos of all areas in question.

☑ Turn this application into the Community Development Department no less than one week prior to Committee meeting date for inclusion in that meeting otherwise Variance will be heard the following meeting. Incomplete applications will be held and the applicant will be notified of it being incomplete. An incomplete application that is not made complete within one month of notification will be returned to applicant and consider withdrawn. Please note: The Sausalito Building Inspector will be notified of withdrawn applications. Work performed in violation of the City of Sausalito Building and Municipal Codes may be subject to penalties and correction orders.

5A 37

5A 10

City of Sausalito
Community Development Dept
420 Litho Street,
Sausalito, California 94965

Tuesday April 27, 2010 4:09 PM
Receipt No.0080885

THIS IS NOT AN ORIGINAL RECEIPT.
THIS IS A COPY.

CDDVAR Undergrounding Varience Fe es - ENG #UV-001	363.00
Total	363.00
Payment: Check # 1728	363.00
Cash:	0.00
Change:	0.00

Customer: Renee Rech
199 Santa Rosa
Sausalito, CA 94965
Cashier: avia
Station: CDD

5A
38

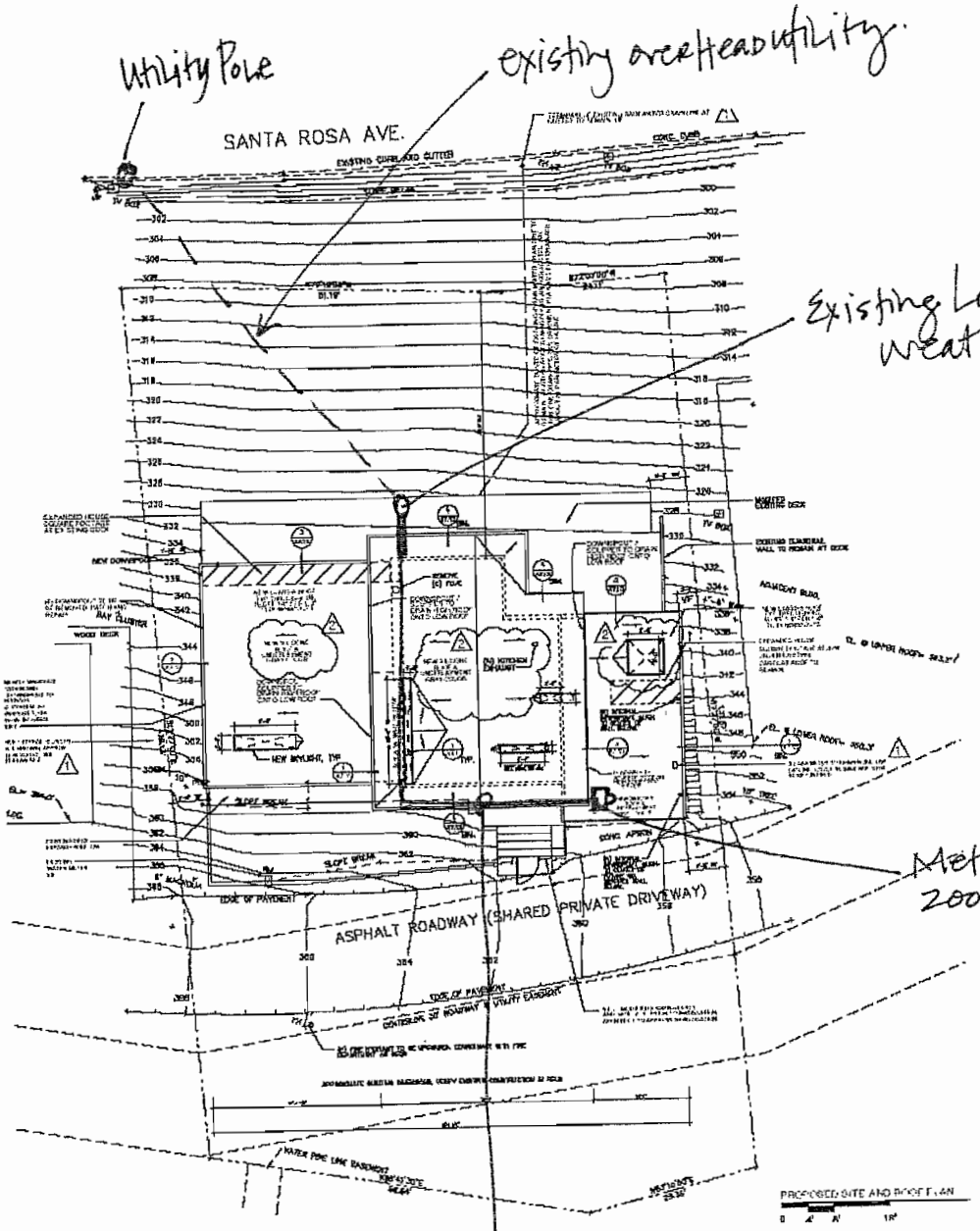
Request for a Variance to put Electrical Underground at 199 Santa Rosa Avenue, Sausalito, CA

The City of Sausalito has mandated the placing of the electrical service underground at 199 Santa Rosa Avenue and we, the owners (Matt David and Renee Rech), are requesting a variance based on many reasons, which are described in the detailed report that follows. Placing the utility service underground will cause unnecessary and unusual hardship on many levels.

PGE has determined the route shown below, which places a new 200A meter main box at the southwest corner of the house, at the masterbathroom. This will require trenching through a concrete/limestone wall surrounding the pole, digging the trench up a steep 53° slope hillside in an area showing signs of major hillside deterioration, placing a box at a corner of our living area, constructing new stairs down to that box for PGE access, continuing with more trenching/digging and conduit along the front of our 40-year old established japanese garden, digging through another concrete wall at the front of the house, to finally arrive at the current box in the carport.

5A 39

A Existing Condition

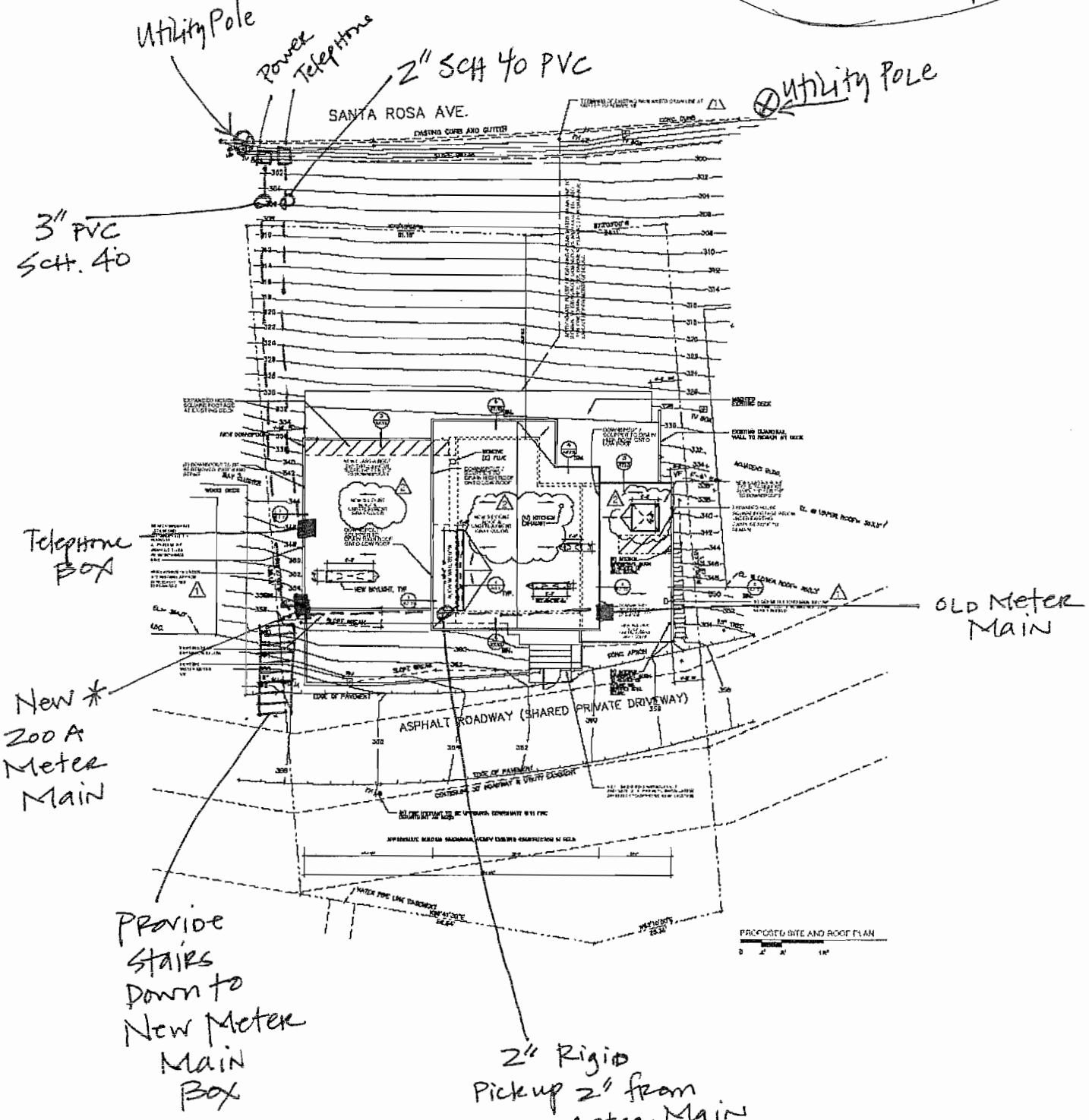


5A/12 5A 40

PGE Proposal

Underground Trenching

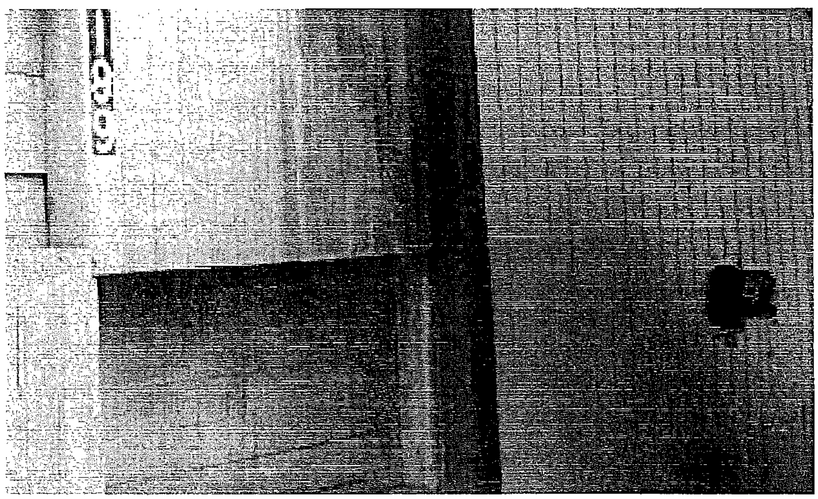
Provide Christy Boxes Per PG & E Spec.



SA/SA 41/13

Reasons for Request for a Variance:

REASON #1 for Request for a Variance – ORIGINAL BOX WAS REPLACED SOLELY BECAUSE UNSAFE
The original box, as shown in the photo below, was originally changed by our previous contractor without us, the owners, being notified of the switch. However, when we discussed this with the electrician, Forest Electrical, who did the work, we were told that the box was changed solely because it was a safety hazard. See Forest Electric's letter on the following page (also previously sent into and on file with city) stating that the old box was heavily corroded, showed signs of burning/overheating, breakers were broken, and grounding was inadequate. He further states that the box was changed out to avoid further safety concerns onsite. The change was NEVER motivated by a desire for additional amperage, and in fact, the home could've been wired with the 125 amp service, according to our current electrician, JP Electric. The original box was estimated as existing since 1960, when the home was built.



FORREST
ELECTRIC
3500 RICKS AVE
MARTINEZ CA 94553
LIC. #421892
925 372 7078

April 13, 2010

To Whom It May Concern:

I am writing to substantiate our "safety-first" decision to replace the existing service panel at 199 Santa Rosa Avenue.

The old service panel at this address was a 24 space Federal Pacific. The internal components and busbars were heavily corroded and there were places on the breakers and the busbars that showed signs of burning, or overheating. A few of the breakers were loose and broken away. Additionally, the grounding was inadequate.

We replaced the service so that we could work at the site without further safety concerns, and I am available to answer any questions that you may have.

Thank you,

Eric Metzgar

5A 5A 44
X5

REASON #2 for Request for a Variance – OVERALL HARDSHIP OF THIS PROJECT

This Project has been going on for 4.5 years, since November 2005. The owners have already experienced unbelievable hardships related to this project. This project originally started as a small interior remodel, and went through the design review process because someone at the city told the owners they needed to. When in front of the committee, the owners were told by the committee, that at that point, that they shouldn't have gone thru design review. As the project unfolded, the initial architect decided he no longer wanted to work on this project, and left the owners in a precarious situation, as they tried to find another architect to take over the project with a planset that was halfway completed. This process took the owners nearly 6 months to find a replacement who was willing to take over the project mid-stream. After finally finding another architect, the project started up again and a contractor, Canyon Construction, was hired. After a month into construction, this contractor told the owners that the city was requiring them to tear off their roof to slope it, and tear off their outer walls and all siding to upgrade the shearwalls, increasing the job costs by hundreds of thousands of dollars. After another 4 months, the rains started and the contractor did not have the roof on completely, and so massive water damage and mold occurred onsite. (This continued for the next 10 months while only tarps were on the site to protect the structure). Two months later, the contractor walked off the job, not willing to fix the damage they had created. The contractor had overbilled the job to about 80% complete, but the owners didn't realize that, as they were financing on own and without a bank to check for % completion. The owners then spent the next 6 months with the site virtually abandoned and water damaged, having their lawyer negotiate with the contractor, trying to get them back on site to fix. Finally, after no success and a non-responsive and negligent contractor, the owner's lawyer advised the owners to fire that contractor and hire another. (Owners will have to sue old contractor after completion of this project, with damages over $500k).

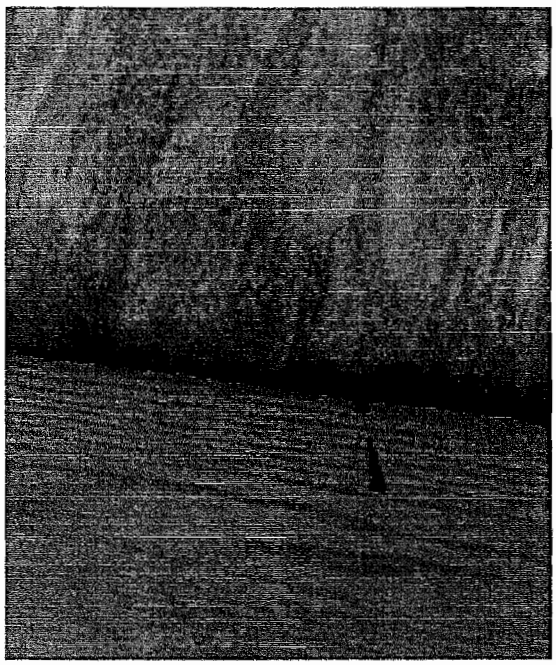
McDonald construction was positioned to take on the new work, the remediation work, and the completion of the project, given the owners could find more financing to finish the project. The owners continued for the next four months in a tough economy, trying to find a bank to finance the remaining work in order for the owners to finish the project. The owners finally found a bank to finance the remaining work, which included over $150k of teardown, rebuild, and remediation of the water damage from the previous contractor. It was also determined at the start of McDonald Construction coming on board, that the previous contractor had overbilled the owners by about $300,000 or more for the work previously completed. To say the least, McDonald Construction and the owners inherited many mistakes and hardships from the negligence of the previous contractor. The Mold and Water Damage alone was comprised of tearing off the roof and rebuilding again, tearing off all of the exterior shearwall and rebuilding again, dry-ice blasting two times because the house didn't pass after one try, hepa vacuuming, wipe down multiple times, expensive dehumidification and air purification equipment rentals, and numerous air and swab tests and retests (over 50 samples taken over a 5 month period during different stages until final clearance was granted by mold remediators only a month ago). To say the least, the process for correcting the old contractor's mistakes has been costly on many levels and the remediation and tear down/rebuild process alone took over 3 months.

In addition to the huge setbacks stated above, there have been daily setbacks and hardships along this whole 4.5 year process. This project is a Healthy Home construction project, which has had its own hardship. Owner, Renee Rech, is severely chemically sensitive and so this home has been constructed using a 125-page manual with strict guidelines and procedures. Along with this comes a tiring process of educating all onboard, and having the right team is critical. No details have been overlooked. And yet the process of building a healthy home such as this, in an industry known to be extremely toxic, has been a daily and tiring struggle and uphill battle for nearly 5 years. It has been strewn with unbelievable stress on multiple levels and the upheaval of building a house has been experienced daily for way too long.

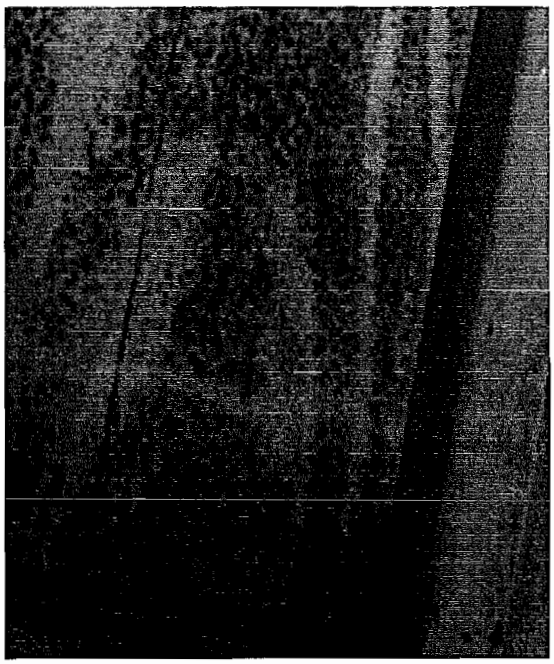
We are on the last leg of this build, about 2 months away from the completion of the project. The setbacks and 4.5 year process have been exhausting. We just want to complete our project and get in our home. We are tired. These added costs and stress are more than we can handle on many levels at the end of our project, aside from the other reasons in this report as to why this added underground electrical situation just doesn't make sense.

5A 5A
16 45

Following are a few photos showing the state of the property left from the other contractor, including water damage, mold, broken tarping, etc.

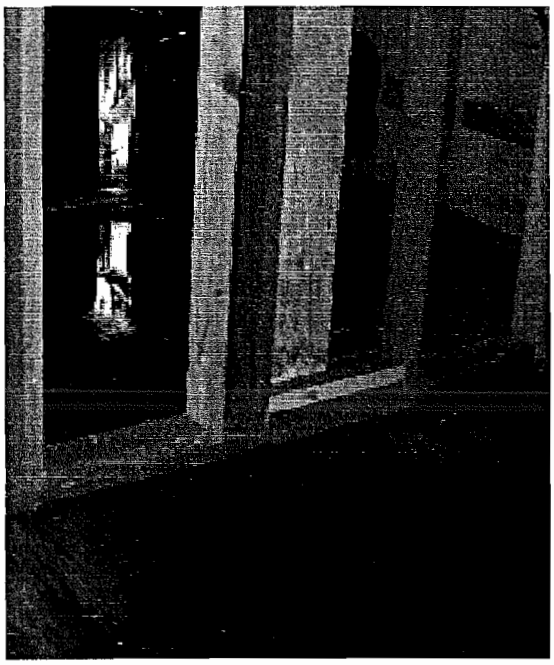


significant water damage and mold throughout mandating extensive mold remediation



significant water damage and mold throughout mandating extensive mold remediation

tarping torn from blowing in the wind and contractor abandoning site



entire top floor had significant water infiltration from contractor negligence

5A 46

REASON #3 for Request for a Variance –
HEALTHY HOME VIOLATION / SIGNIFICANT HEALTH & SAFETY RISK:

As mentioned in Reason #2 above, as a GREEN HEALTHY HOME PROJECT, this project is a very special project, that has had special considerations all along the way. Marilee Nelson is the healthy home consultant that was hired early on to create a manual for Renee's medical condition. Marilee Nelson works with chemically-sensitive people throughout the US to create safe buildings so that they can live in them free of toxin exposures. A 125-page Healthy Home manual was created for this project, which is a step-by-step guide of materials and procedures for creating this healthy home. Alongside Marilee Nelson, Stephen Scott was hired. Stephen is a EMF (Electromagnetic Frequency) specialist and licensed electrician who works on Construction projects throughout the US to create homes free of EMF pollution for inhabitants. Stephen created an EMF guideline for our project as well and has been an integral part of the team, in communication with our electrician, Dusty from JP Electric, to make sure the home is free of EMF pollution. Great lengths have been taken to create this healthy home. And hundreds of thousands of dollars extra have been invested in this project to make this home healthy and ensure the success of Renee having a healthy home to heal.

See the list of healthy home features and photos on the following pages, which lists and shows some of the features that make this home healthy. With the right team now onboard finally, the project has turned a more positive corner in the last 6 months, and we have over 60+ partners and positive press expected surrounding our project. It is innovative and exciting, and on the cutting edge of what can take place with healthy Green building. We are making many building decisions out of necessity...for the safety, health and wellbeing of the owner. However, many people are excited about what this project means for the future of healthy home building....

The electrical service poses a huge risk for the owner, and completely contradicts all that we have done thus far to avoid the EMF exposure for the inhabitants. We have gone to great lengths to have zero EMF in this home by doing things like upgrading to expensive ARMOR cable (vs Romex) throughout the entire home, installing LEDs, etc. We have spent at least $30k extra, to avoid EMF exposure.

PGE's plan brings the box onto the southwest corner of the home, and further runs the cable along the southside of the home. Both conflict with the EMF guidelines and will dramatically expose the owner to EMF, which she is highly sensitive to.

It must be noted that this entire house construction project started as a Healthy Home remodel because the home was uninhabitable by the owner, due to high levels of EMF and toxins from carpet, particleboard cabinets, etc. The owners ventured into the remodel as a way to simply be able to live in the home. As you can see, the process has snowballed into something much bigger than they ever imagined. They have invested the last 4.5 years of their lives toward creating a healthy home so that the owner can, in fact, live in this home, in the end. What PGE is proposing puts the client's health and healing at significant risk and will cause unnecessary and unusual hardship...and risks her being able to live in the home. The owner needs a place to heal, away from the toxins of the world.
And she needs her home to be that place.

California Pacific
Medical Center
A Sutter Health Affiliate
With You. For Life.

INSTITUTE FOR HEALTH & HEALING

2300 California Street
San Francisco, CA 94115
415.600.HEAL (4325)

Also providing services at
Marin General Hospital and
Novato Community Hospital

5 Bon Air Road, Suite 121
Larkspur, CA 94939
415.925.7624

4/23/10

Dear City of Sausalito,

I've been treating Renee Rech for nearly 10 years for extreme sensitivities to chemicals, pollutants, electromagnetic radiation, etc. Renee and her husband have been building a healthy home for the last 4 years, in an effort to provide a safe and healthy home for her to heal. They have gone to great lengths to make sure the home is free of toxins and EMF exposure.
I believe it is only in such an environment, free of such toxins and stressors, that Renee's immune system will be able to heal.

To expose Renee to toxins, chemicals, pollutants, or EMF at this stage of her illness would be detrimental to her health and pose a serious risk to her. When exposed, her reactions can be severe.

If you have any questions about this, please feel free to call me.

Michael Cantwell, MD
California Pacific Medical Center
Institute for Health and Healing
(415)600-3503

5A 5A 48
19

Stephen Scott
42 Maybeck St Novato, CA
Tel: 415 328-8650 Fax: 415 634-3201
California State Contractors License No. B, C-10 582235
E-mail: EMFScott1@gmail.com

April 26, 2010

Renee Rech
199 Santa Rosa Ave
Sausalito, CA
Tel: 415 244-2864

Re: Increased EMF Exposures in Proposed New Service Location

To Whom This May Concern:

Renee and Matt have just informed me that the City of Sausalito has proposed the electric service be relocated to the Northwest corner of the house directly outside dressing room and master bath area. Under normal load conditions this location for the service equipment would create a significant increase in magnetic field exposure in the master suite and represents a potential health hazard for Ms. Rech who suffers from extreme electrical sensitivity. As EMF consultant to Renee and Matt for several years, I am familiar with their health concerns and strong interest in creating a healthy and energy efficient home. They have already suffered excessive costs and emotional distress in order to accomplish this worthy goal. Their home is scheduled to be featured as a model healthy green home in a National publication upon completion. It is my hope that the City of Sausalito will reconsider the service design they have proposed and allow a variance for the carefully planned low EMF design for the electric service.

For those new to the subject of EMF and health, numerous scientific studies and published Government reports have established a connection between exposures to 60Hz magnet adverse biological changes in the human body. Therefore, this EMF Management Guideline has been prepared to provide all concerned personnel with the theory, layout and installation procedures, product and materials specifications appropriate to minimize EMF exposures at ELF (30Hz to 300Hz) and VLF (300Hz to 3000Hz) frequency ranges and high frequency electrical noise from 3Khz to 50Khz.

In scientific terms, AC magnetic and electric field are described as time varying, and change in direction and magnitude 60 times a second. By the process of electromagnetic induction, alternating magnetic and electric fields exert

5A 5A 49

oscillating forces on the molecules of conductive materials and producing measurable currents and voltages. The bodies of humans and animals are highly electrically conductive and have been found to experience changes in physical, chemical and electrical properties when exposed to AC magnetic and electric fields. Within the last decade, The US Dept of Health and State of California Dept of Health Services have reported that exposure to 60Hz magnetic and electric fields have a weak but consistent connection with an increased incidence of human health problems including cancer, leukemia, Lou Gehrig's Disease and Alzheimer's Disease, sleep disorders, electrical sensitivity, psychological disorders and many other aspects of human health.

Please feel free to contact me if you have any further questions.

Yours truly,
Stephen Scott

5A
5A
50

Below is a list of Healthy Home and Green Features of this Home, showing the great lengths that are being taken to avoid toxic and EMF exposures for the owner:

HEALTHY HOME FEATURES:

— All products and materials (including typical green products) have been thoroughly researched and carefully chosen for use in this home. Only the cleanest, non-toxic products without industrial waste or toxins will be used in this home.

— None of the following substances, which are often found in modern building products, will be used: no flame-retardants, biocides, fungicides (SVOCs); no isocyanates or urea formaldehyde; no particleboard, osb, or pressed-board; no herbicides, fungicides and pesticides; no composite wood products containing urea formaldehyde; no products containing asphalt or bitumen

— All materials will be properly applied so that they will fully cure and have no remaining emissions for the life of the product. Application of materials will be adjusted to climate conditions on site to ensure complete offgassing; ventilation with temperature and humidity controls will be used.

— Special protocols will be used for demolition, fiberglass insulation removal, carpet removal,etc to minimize toxin release.

— Only untreated, pesticide-free woods will be used in the home. Only hardwoods with minimal/low terpenes will be used in interior spaces. Composite woods and plastics that off-gas chemicals into the interior environment will be avoided.

— All plywood mandated for structural sheer regulations will be exterior-grade urea-formaldehyde-free and will be offgassed and then sealed with a non-VOC product to minimize residual off-gassing.

— Special waterproofing processes, materials, and systems for roof, doors & windows, and showers will be used to minimize mold and water infiltration.

— Exciting and innovative products will be used throughout, for example: a magnesium-oxide board will be used instead of gyp board for drywall. This board is naturally fireproof, waterproof, moldproof, and insect-resistant without the inclusion of fungicides, biocides, or flame retardants. It provides superior moisture resistance in high-humidity areas and combats the growth of mold and mildew. It will limit dust and offgassing and improve the overall health of the home.

— An air-tight drywall approach will be used when applying the drywall in the home in order to create an airtight air barrier for the interior space to minimize any offgassing and air infiltration into the living space from the internal walls of the home.

— Cotton insulation from recycled bluejeans will be used which was independently tested in a lab in Germany and found to be free of pesticides, toxic flame retardants, phthalates, and other chemicals.

— All concrete work will be free of any toxic admixtures or flyash (flyash is made from toxic coal byproducts).

— Aluminum windows and aluminum exterior doors will be used to limit offgassing of chemicals that may be found in other window and door products (such as vinyls and composite wood windows/doors).

— All interior doors and front door will be made from FSC-certified, untreated solid wood and non-toxic glue (no composite wood).

— Non-toxic, no-VOC silicon roofing material will be used.

— Metal and glass components will be used wherever possible to minimize offgassing.

— All plumbing supply piping will be Aquatherm Greenpipe, limiting the toxic exposure from PVC and metals.

— An emf (electrical magnetic frequency) consultant was hired to consult on wiring and electrical aspects of the home to ensure it to be free of emf pollution.

— Entire home will be wired with armor cable, instead of standard romex, to eliminate electric fields. Other non-traditional electrical guidelines will be followed in order to minimize emf pollution (such as spacing of electrical outlets in bedrooms, healthy wiring vs. wireless, etc).

5A/5A
22 51

— Energy efficient LED lighting will be used instead of florescents.

— A highly-efficient heating, ventilation, and purification system was specially designed which includes:
- — an energy-efficient ERV system
- — a HEPA/Carbon whole house air purification system
- — galvanized steel ductwork to eliminate off-gassing of flame-retardants, phthalates, and plasticizers often found in other plastic and aluminum flexible ducting
- — non-VOC mastic and special taping procedure to minimize mastic use
- — a multiple-zoned system allowing the owner the ability to seclude and/or circulate the air in different areas of the home together or independent of eachother
- — only fresh air will enter the system and it will be filtered and then circulated on intervals to ensure pure, balanced, and pressurized air in the home at all times

— Photoelectric non-toxic smoke detectors.

— Whole house water filtration system with filtration based on specific water testing done on-site.

— Tubs, sinks, and countertops have been researched and/or tested to meet offgassing guidelines.

— No open-combustion gas appliances or equipment will be used in this home.

— Garage/Carport will be open to the external environment to minimize automobile exhaust coming into the home.

— Cabinets have been tested for compliance with strict guidelines regarding formaldehyde emissions.

— All metal closet systems and solid wood shelving (no particleboard shelving) will be used.

— Bau-biology principles are used throughout home.

— All plans were reviewed, modified, and approved by a FengShui consultant.

— Infra-red Sauna for detoxification.

— Non-toxic furnishings will be used throughout the home as much as possible by avoiding: synthetic fabrics with flame retardants, pressboard or particleboard furniture, vinyls, toxic polyfoam inserts, etc. Solid wood furniture, natural fabrics & floor rugs, and organic mattresses, sheets & towels will be used instead.

— Non-toxic lifestyle choices: natural body-care, non-toxic household and cleaning products, no dry cleaning, etc.

<u>ADDITIONAL GREEN FEATURES:</u>

— Maximum recycling and reuse of construction debris and materials. Donation of the entire home at demolition to a non-profit recycle/re-use company that deconstructs the home, rather than demolishing it. [95% of the original home will be re-used or recycled].

— Ongoing waste management program on site to divert project waste away from landfill.

— Locally-sourced materials and vendors will be used wherever possible.

— Zero-VOC paints and finishes.

— Passive solar heating through maximum glazing in windows and skylights.

— Thermally broken, low-E solarband, double-pane insulated aluminum-framed windows.

— Passive cooling by taking advantage of prevailing bay winds.

— Dupont Tyvek breathable air gap and vapor barrier.

— Light-colored, energy-efficient, No-VOC, silicon roofing material with the life expectancy of 20+ years.

— FSC-certified renewable hardwoods used throughout home.

— Reclaimed and reused douglas fir framing.

— Cotton insulation made from blue-jeans.

— Mold-proof, fire-proof, waterproof, insect-resistant, No-VOC magnesium oxide drywall board.

— Natural, environmentally-certified Ceasarstone quartz countertops.

— High-efficiency water heater with recirculation system.

— Interior air quality management system: energy-efficient HVAC system with pressure-balanced air to maximize home's air quality, performance and energy efficiency. Whole house fan with variable speeds and mechanical ventilation heat exchanger (HRV).

— Energy efficient exhaust fans and exhaust hood.

— Energy star high-efficiency appliances and electronics.

— Dual-flush low-flow toilets; low-flow faucets and shower fixtures.

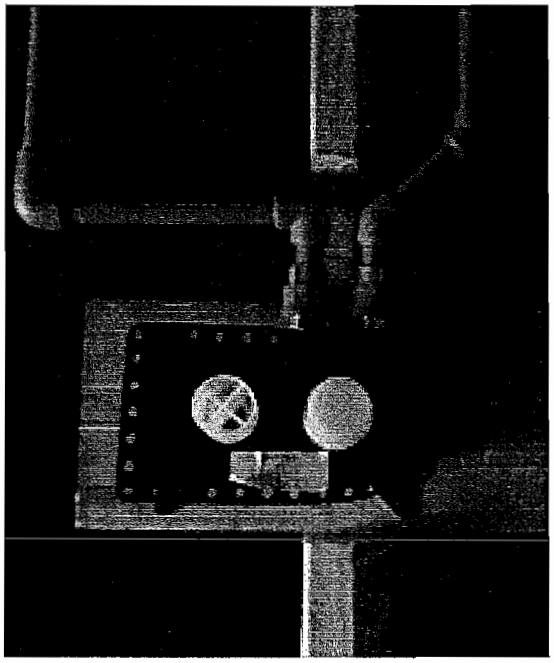
— Title 24 energy regulations surpassed.

— LED and energy efficient lighting.

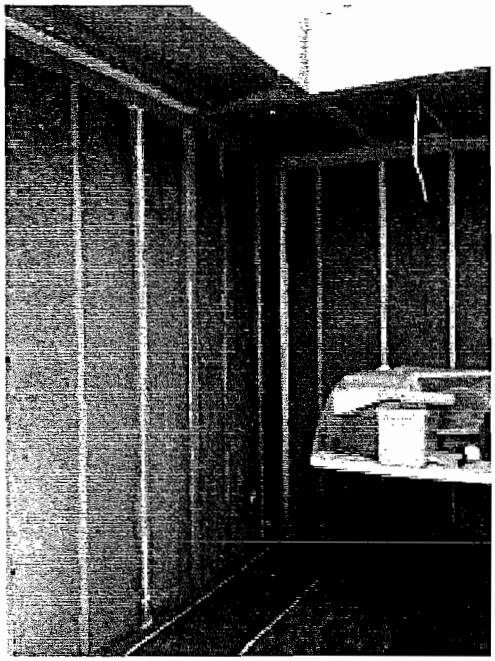
— Drought tolerant landscape using California native, sustainable vegetation.

— Solar energy thru a solar leasing program.

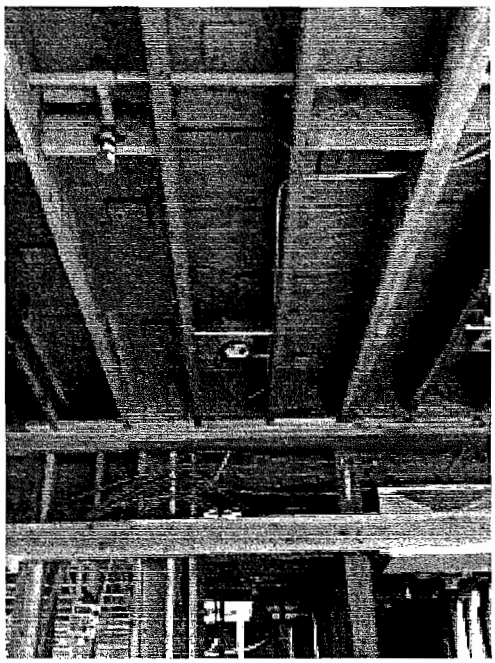
Following are a just few photos of Healthy Home and Green Features of this Home, showing some examples of the great lengths that are being taken to avoid toxic and EMF exposures for the owner (more photos available upon request):



Non-Toxic Aquatherm GreenPipe
to avoid PVC and metals

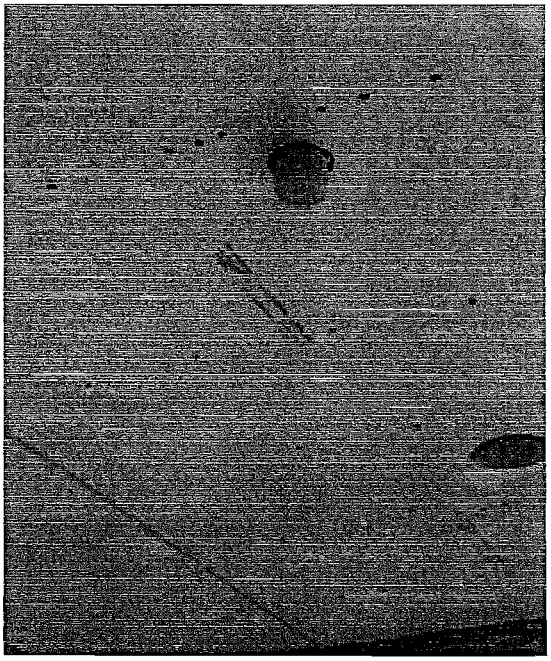


Non-Toxic Cotton Insulation and Extensive
Caulking to avoid air/toxin infiltration

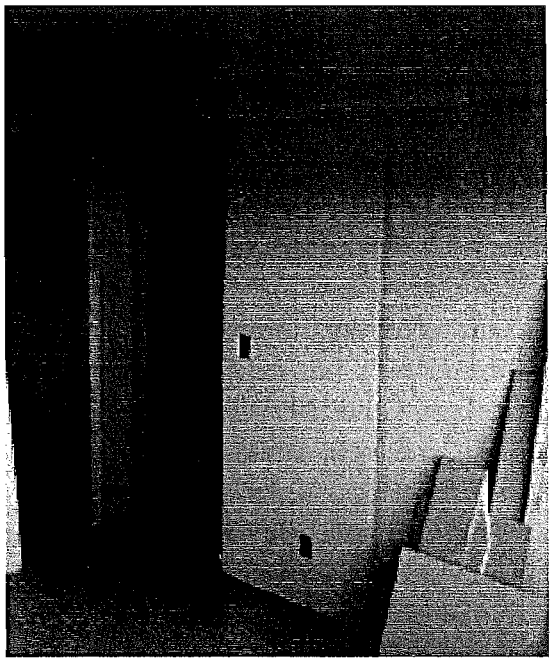


Armor Cable for Electrical throughout house and
Extensive Caulking to avoid air/toxin infiltration

Caulking of all holes/penetrations, including
electrical boxes to avoid air/toxin infiltration

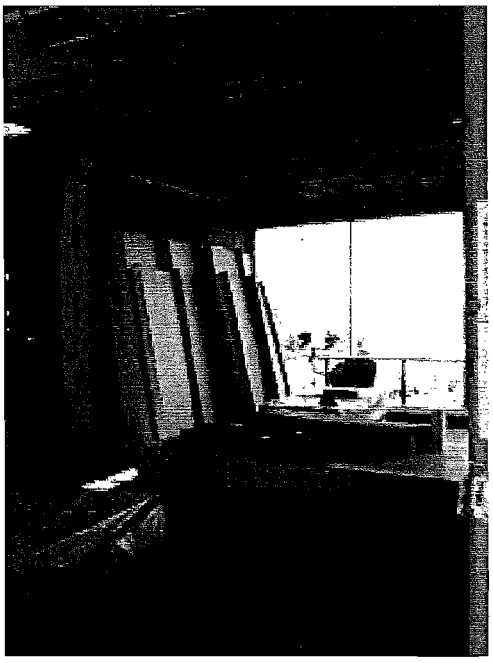


Special Mold-proof, fire-proof, water-proof, insect-resistant Magnesium Oxide Dragonboard instead of toxic drywall



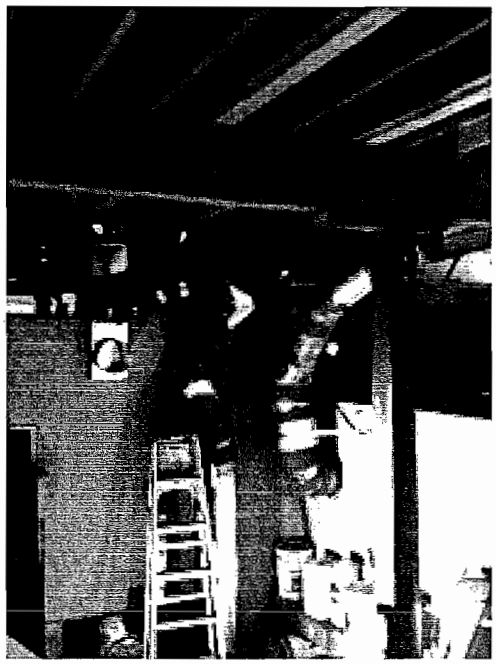
Magnesium Oxide Dragonboard caulked with special air-tight drywall approach which limits air/toxin exposure into interior

All doors in solid-core untreated poplar, rather than typical doors which are loaded with formaldehyde and layers of glues

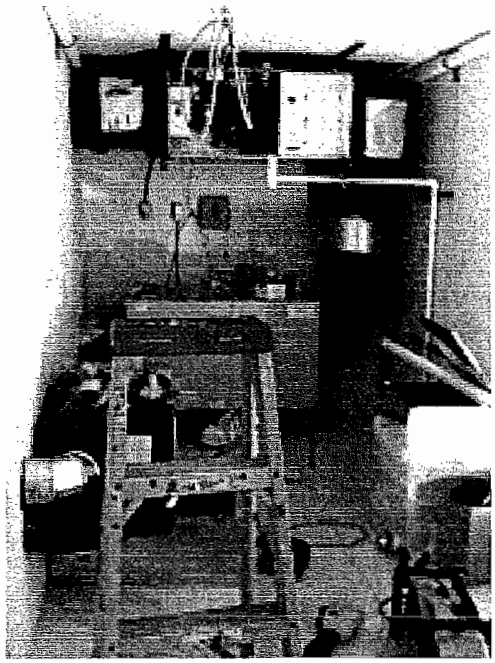


stacks of dragonboard, solidcore poplar doors, and nontoxic cotton insulation

SA 55

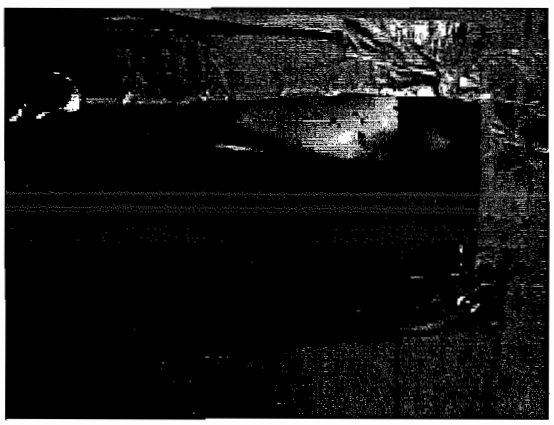


Special attention to the HVAC system.
All Galvanized Steel ductwork with non-toxic mastic. Special cleaning of ducts to clean off oils from factory, prior to install.



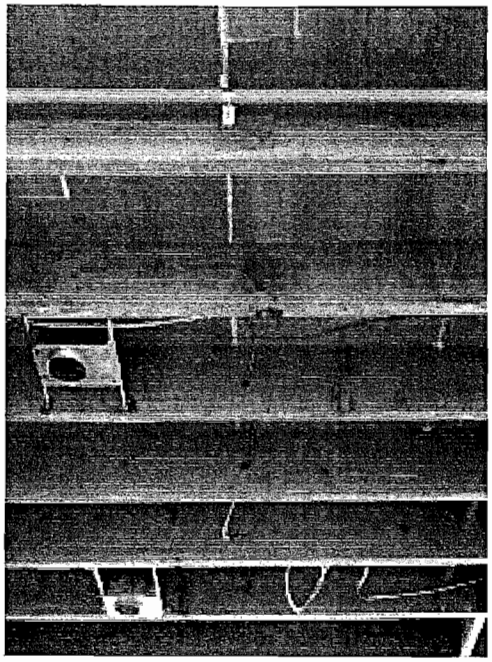
Inside the mechanical room (in progress), showing the HVAC system, ERV system, and special whole house PURE-AIR air purification system. Whole house water purification system will be located in here as well.

whole house PURE-AIR air purification system.
and special cleaning of ducts.

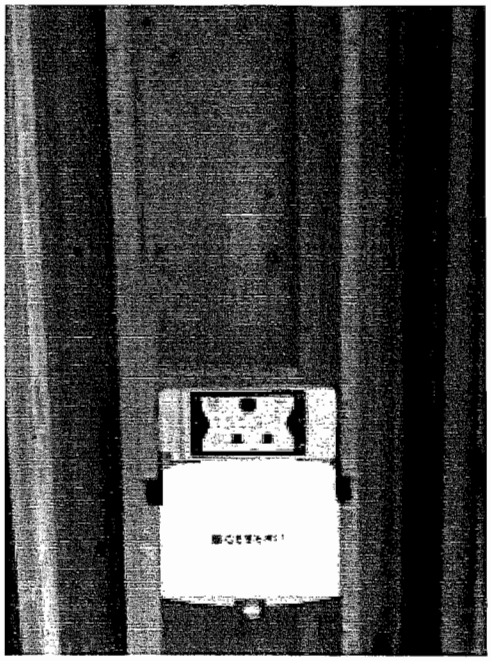


Special procedures of caulking and taping and covering around registers to limit exposures into the HVAC system.

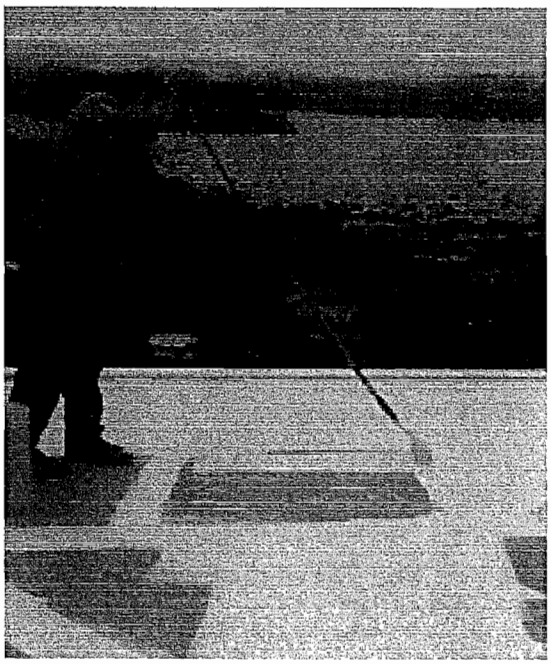
5 of SA 56



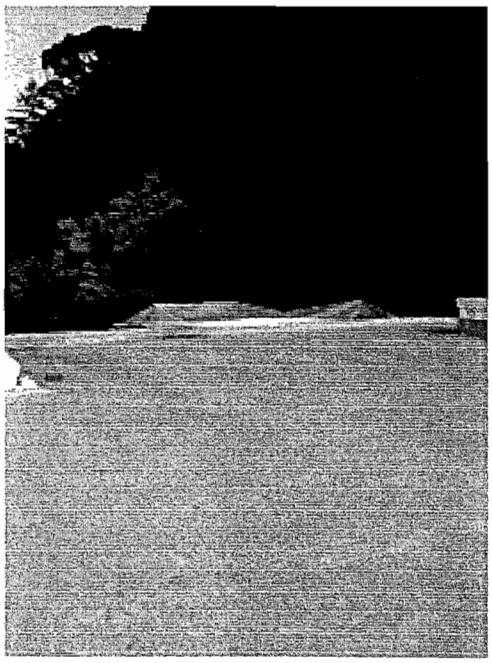
Air-tight Recessed Cans and extensive caulking to limit air/toxin exposure into interior



In-wall tank system for dualflush toilets

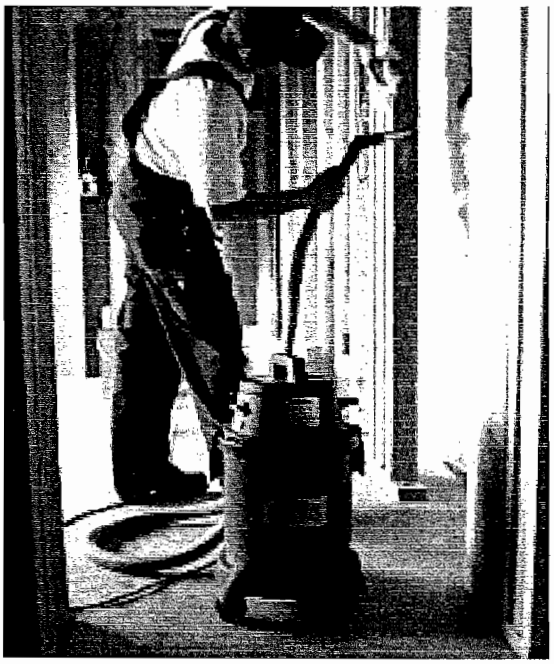


Non-toxic silicon roof



Non-toxic silicon roof

5/20 SA 57



Hepa Vacuuming and wiping, dehumidifiers, and air purification for final stage of mold remediation

Hepa Vacuuming and wiping, dehumidifiers, and air purification for final stage of mold remediation

Hepa Vacuuming and wiping, dehumidifiers, and air purification for final stage of mold remediation

Hepa Vacuuming and wiping, dehumidifiers, and air purification for final stage of mold remediation

REASON #4 for Request for a Variance – FINANCIAL HARDSHIP

As shown below, we have obtained multiple bids. Even with some items still outstanding, this shows the costs for completing this undergrounding of electrical to be completely unreasonable.
The undergrounding on this property is not a simple job. It requires 2 boxes, is costly, and dangerous. It requires exorbitant landscape costs to trench up the hill, bore through limestone and rock, and to repair the trenching through the garden and fence. It requires exorbitant costs for building stairs down the hill to provide a 3' access and flat platform to a new box that PGE says would be required.
It puts added financial hardship on a project that is hundreds of thousands over-budget, and puts unbelievable stress on us, the owners, who have already experienced massive hardships of all kinds, including incredible financial strain that has put the project at risk of completion many times. After nearly 5 years + 2 architects + 2 builders + $500k lawsuit, we have stretched beyond what is financially possible. We have borrowed money from multiple family members in order to complete the project. We even lived with family for 4 years, saving on rent, in order to finish the project. We have made continued sacrifices such as these all along the way, in order to finish the project. This added cost, at this late stage when all of our monies are spent toward the remaining construction, will break us...and most likely inhibit us from finishing our project, getting into our home, and having the bank pay off the contractor. Additionally, the timing of being able to get PGE plans & estimate & work accomplished would be AFTER our project is complete, which will prevent our final permit sign off & inhibit our ability to refinance the project & pay off our contractor. The financial hardship of this job is hard to describe other than there is no more money left. We are overstretched and have suffered immensely from this almost 5 year build and the impending lawsuit...

SA 39
SA 30

SUMMARY OF PROPOSALS AND TOTAL COSTS INVOLVED:

The scope of work included in bids attached:
01) provide underground 150' trenching from pole on Santa Rosa Avenue to the south, up the hill, to the SW corner of the home.
02) install 150' of 3" PVC conduit in trench from Santa Rosa Avenue to the SW corner of the home.
03) Install 150' of 2" conduit in trench for telephone cable
04) Provide 2 PGE spec Christy boxes
05) Provide pull strings in conduits
06) Intercept 2" rigid from old meter. Run to new meter.
07) Provide new secondary feeders from old meter to new meter.
08) fill back for erosion control and coordinate hillside erosion control with other subs.
09) Construct new stairs down from Easement to SW corner of house to provide access to box for PGE

COSTS (see estimates on the pages to follow):

Trenching Estimates:
McDonald Construction – $32,410
Maverick Construction– $29,800
LJ Construction - $25,800

Electrical Estimates:
JeanPaul Fischer Electric – $11,087
Forrest Electric – $21,940

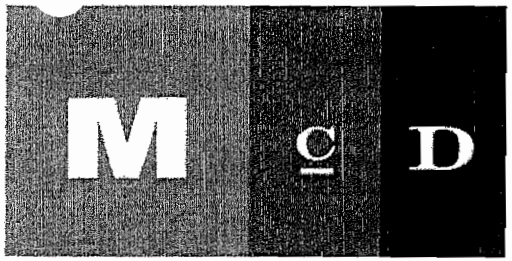
PGE Estimate:
PGE - loosely estimated at $2,500-4,500
1) they can not give an estimate for this work until a $2000 non-refundable 'estimating' deposit is given
2) this estimate may not include cost to supply a 17x30" splice box at the base of the pole, expose the service going across the street to 214 Santa Rosa, and supply conduit from the splice box back to the service to 214 and from the splice box back to the pole
3) they cannot guarantee work to be completed in accordance with our project timeline, which will stall the loan closing, final permit sign-off, etc.

Staircase:
McDonald Construction – $22,587

Outstanding Items for pricing: Bore through limestone wall surrounding pole at street (may cost more than estimated); stabilize hillside and soil erosion control; Landscape remediation at Japanese Garden; Bore through concrete wall at front of house (not sure if this is even possible);

TOTAL COSTS ESTIMATED BETWEEN $60k-85k+

5A 54 60
B1



McDONALD
CONSTRUCTION AND DEVELOPMENT

McDonald Construction and Development, Inc.
5950 Margarido Drive, Oakland, CA 94618
Tel: 510-550-4966 Fax: 510-380-0670
License Number: 861427

Project Cost Estimate

Prepared for: Matt David
Project: 199 Santa Rosa, Sausalito, CA

Prepared by: Mike McDonald
Date: April 24, 2010
Proposal No: 199.PGE.001

SCOPE OF WORK	COMMENTS
EXCAVATION, OFFHAUL, AND HILL STABILIZATION FOR INSTALLATION OF UNDERGROUND PGE SERVICE	
1 DIG 150 LINEAR FEET OF TRENCH FOR 4" AND 2" CONDUIT	
2 BACK FILL WITH APPROPRIATE SAND AND DAMS AT 25 FEET APART	
3 TRENCH DUG TO ONE PGE BOX AT END OF RUN	
4 INSTALLATION OF JUTE NETTING ON HILL FOR STABILIZATION	
5 OFFHAUL OF ALL SPOILS	
6 PERMIT, PLANS AND INSTALLATION OF CONDUIT AND ELECTRICAL BOXES BY OTHERS	

ESTIMATE SUMMARY	
SUBTOTAL ESTIMATE:	$26,785
Overhead @ 10%	$2,679
Subtotal	$29,464
Profit @ 10%	$2,946
Total	$32,410

PAYMENT OF $1,000 OR 10% OF CONTRACT AMOUNT, WHICH EVER IS LESS, DUE UPON SIGNATURE OF FORMAL CONTRACT. BALANCE DUE UP ON COMPLETION OF WORK.

IF THIS PROPOSAL IS ACCEPTABLE, PLEASE INDICATE BY SIGNING BELOW, FAXING BACK TO US, AND WE WILL ISSUE A FORMAL CONTRACT FOR EXECUTION.

AGREED:

OWNER'S NAME:

DATE:

Page No. of Pages

Proposal

Cal. Lic. # 583288

MAVERICK CONSTRUCTION

P.O. Box 2901 • Sausalito, California 94966 • (415) 331-2000

PROPOSAL SUBMITTED TO: Matt David	PHONE: 331-2233	DATE: 4/26/10
STREET: 199 Santa Rosa Ave.	JOB NAME: FAX 331-~~4465~~ CEL 577-9066	
CITY, STATE AND ZIP CODE: Sausalito, Ca 94965	JOB LOCATION: 4464	
ARCHITECT	DATE OF PLANS: N/A	JOB PHONE

We hereby submit specifications and estimates for:

Scope of work to include,

1) Trench and install trench sand, condwits for P.G.&E., T.V., Telephone, backfill w/ compaction, per P.G.&E. specs. — From pole to meter. All trench backfill greater than 2/1 slope will be mortared in rip-rap backfill.

We Propose hereby to furnish material and labor — complete in accordance with above specifications, for the sum of:

dollars ($ 29,800).

Payment to be made as follows:

All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.

Authorized Signature

Note: This proposal may be withdrawn by us if not accepted within 10 days.

Acceptance of Proposal — The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance:

Signature

Signature

5A 5A 62 33

Sebastopol Construction Services, Inc.

dba **L.J. Construction**

General Engineering Contractor State Lic. # 776158
9460 Graton Road • Sebastopol, CA 95472
24 Hour Phone/(707) 823-0247

Proposal

Page No. of Pages

4/23/2010

Matt David
199 Santa Rosa Ave
Sausalito CA 94965
415-331-2233 c 415-577-9066
fax 415 331-4033

Re: P. G. E. service

(1) Dig 150 feet of trench for 4" and 2" pipes
(2) Backfill with sand Check dams 25 feet apart
(3) One P.G.E. box at top of run .
(4) Haul off dirt
(5) Owner has no plans
(6) Jute netting

"Under the Mechanics' Lien Law (California Code of Civil Procedures, Section 1181 et seq.), any contractor, Sub-contractor, laborer, supplier or other person who helps to improve your property but is not paid for his work or supplies, has a right to enforce a claim against your property. This means that, after a court hearing, your property could be sold by a court officer and the proceeds of the sales used to satisfy the indebtedness. This can happen even if you have paid your own contractor in full, if the subcontractor, laborer, or supplier remains unpaid."

WE PROPOSE hereby to furnish material and labor -- complete in accordance with above specifications, for the sum of:

Payment to be made as follows:

To be paid in full upon completion 25.800.00

All material is guaranteed to be as specified. All work to be completed in a substantial workmanlike manner according to specifications submitted, per standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workmen's Compensation Insurance.

Authorized Signature

Note: This proposal may be withdrawn by us if not accepted within 15 days.

ACCEPTANCE OF PROPOSAL The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature

Date of Acceptance:

Signature

I agree to pay all charges and collection fees. Attorney fees will be borne by me in the county in which indebtedness is accurred.

5A 63
5A 34

Jean Paul Fisher Inc.

Electrical Contractor
2218 Brittany Lane
Martinez, CA 94553

Estimate

Date	Estimate #
4/22/2010	10-020

Name / Address
McDonald Construction Sausalito Residence 199 Santa Rosa Ave Sausalito, CA 94965 Vnet

Project
Sausalito Residence

Description	Qty	Cost	Total
3" PVC schedule 40	300	9.54	2,862.00
3" PVC parts and glue	1	350.00	350.00
Reroute existing 2" ridged conduit to new meter location and pulling new feeder	1	4,000.00	4,000.00
200 Amp meter main panel Square D	1	225.00	225.00
Christy pull boxes	2	75.00	150.00
PG & E estimate Fees for connection		3,500.00	3,500.00

Subtotal	$11,087.00
Sales Tax (9.0%)	$0.00
Total	$11,087.00

Phone #	Fax #	E-mail
(925) 408-7424	925-229-2790	jpfisherelectric@yahoo.com

5A 64
54 35

GENERAL PRICING

FORREST ELECTRIC
3500 RICKS AVE
MARTINEZ CA 94553
LIC. #421892
925 372 7078

SANTA ROSA AVE NEW UNDERGROUND SERVICE
ESTIMATE FOR MATT DAVIS

4/27/2010

DESCRIPTION OF ITEMS IN LOCATIONS SHOWN	QUANTITY	FIXTURE ALLOWANCE EACH	GENERAL MATERIAL EACH	MATERIAL EXTENDED EACH	TOTAL ITEM MATERIAL	LABOR EACH	LABOR EXTENDED	ITEM TOTAL
ALL MATERIAL PRICES INCLUDE RELATED INSTALLATION MATERIALS								
ITEM 1 - PROVIDE AND INSTALL 1 PGE UNDERGROUND BOX AND LID NEAR EXISTING UTILITY POLE - RIGID 3 INCH FROM NEW PGE BOX TO LIMESTONE WALL - CORE WALL INSTALL SURFACE PGE TERM.CAN								
PGE UG BOX AND LID	1	0	350	350	350	575	575	925
3 INCH PVC TO TERMINATION CAN - LOT	1	0	125	125	125	450	450	575
PGE TERMINATION CAN FOR 200 AMP	1	0	175	175	175	510	510	685
CORE DRILL	1	0	0	0	0	500	500	500
ITEM 2 - PROVIDE AND INSTALL TELEPHONE CONCRETE UNDERGROUND BOX NEAR EXISTING UTILITY POLE - RUN 2 INC PVC FROM SAME TO NEW 2 INCH LB - CORE 2 INCH THROUGH WALL								
CORE DRILL	1	0	0	0	0	250	250	250
CONCRETE UG BOX AND LID	1	0	125	125	125	350	350	475
2 INCH PVC TO WALL LB	1	0	75	75	75	250	250	325
ITEM 3 - HAND DIG 150 FT TRENCH UP HILL 2.5 FT DEEP - CONSTRUCT SOIL PLATFORMS - INSTALL NEW 3 INCH SCH 40 PVC FOR POWER WITH PULL ROPE FROM NEW PGE TERMINATION CAN TO NEW SERVICE LOCATION INSET FROM STREET NEAR SOUTH WEST CORNER OF RESIDENCE - INSTALL NEW 2 INCH PVC CONDUIT WITH PULL ROPE FOR COMM USE FROM NEW LB TO TELEPHONE P.O.C AT RESIDENCE								
3 INCH PVC, FITTINGS AND ROPE - LOT	1	0	550	550	550	1600	1600	2150
2 INCH PVC CONDUIT WITH ROPE - LOT	1	0	300	300	300	850	850	1150
CONSTRUCT MOVEABLE SOIL PLATFORM	2	0	250	250	500	350	700	1200
ITEM 4 - INSTALL NEW RETAINING WALL AROUND AREA NEAR SERVICE LOCATION - BACK FILL AREA SO IT IS LEVEL 4 FT OUT FROM EDGE OF THE STREET - MAKE WALL HIGH ENOUGH TO MOUNT 200 AMP SERVICE								
LOT FOR WALL, SERVICE BACKBOARD, BACKFILL	1	0	1500	1500	1500	4200	4200	5700
ITEM 5 - SET NEW 200 AMP SERVICE - INSTALL NEW 2 INCH UG FEEDER TO NEW UNDER HOUSE TERMINATION CAN - PULL NEW 4/0 AL CONDUCTORS TO NEW CAN IN PREPATATION FOR POWER TRANSFER ONCE NEW UNDERGROUND IS COMPLETE								
NEW SERVICE AND GROUNDING	1	0	525	525	525	750	750	1275
2 INCH PVC AND EMT TO NEW 18 X 18 X 4 INCH DEEP SC CAN	1	0	350	350	350	1350	1350	1700
4/0 CONDUCTOR PULL AND TERMINATIONS	1	0	800	800	800	680	680	1480
ITEM 6 - REMOVE EXISTING IN WALL 200 AMP METER MAIN IN GARAGE AND REPLACE WITH NEW 200 AMP 40 SPACE LOAD CENTER - PULL OUT EXISTING CONDUCTORS TO EXISTING WEATHERHEAD - RE PULL CONDUCTORS TO NEW UNDER HOUSE TERMINATION CAN - MAKE CONNECTIONS - RESTORE POWER								
NEW LOAD CENTER AND TERMINATIONS - LOT	1	0	450	450	450	1500	1500	1950
RE PULL CONDUCTORS AND TERMINATE	1	0	20	20	20	450	450	470
ITEM 7 - MISC								
INSPECTIONS AND MEETINGS	1	0	0	0	0	380	380	380
DESIGN AND PLANNING	1	0	0	0	0	750	750	750
ITEM 8 - EXCLUSIONS								
PERMITS AND FEES	0	0	0	0	0	0	0	0
TOTAL MATERIAL					**$ 5,845.00**			
TOTAL LABOR							**$ 16,095.00**	
TOTAL ESTIMATE								**$ 21,940.00**

52
26
SA
65

PGE Estimate

From: Chan, Chris
Sent: Wednesday, March 31, 2010 1:43 PM
To: Jean Paul Fisher
Subject: 199 Santa Rosa Ave., Sausalito

Jean Paul,

After meeting on site last week, I went down to Santa Rosa Ave to take a look of the area around the pole. For the new service at 199 Santa Rosa, you will need to supply a 17"x30" splice box at the base of the pole. There is a cable box next to the pole so you will have to install the box adjacent to that. You would also have to expose the service going across the street to 214 Santa Rosa and supply conduit from the splice box back to the service to 214 and from the splice box back to the pole. All the details will be on the job sketch that I'll send to you once engineering is completed. But before I engineer the job, we will need a $2,000 project deposit.

Per our conversation in the field, you were looking for an estimated cost of the work. Assuming you will be doing the trenching and installation of substructure, you're looking at about $2,500-$4,500. The reason for the difference is that the customer will receive two options (refundable or 50% discount) of payment because of the scope of the job.

Chris Chan
Sr. Elec. Estimator
415-257-3384

5A/5A 66
B7

McDONALD CONSTRUCTION AND DEVELOPMENT

McDonald Construction and Development, Inc.
5950 Margarido Drive, Oakland, CA 94618
Tel: 510-550-4966 Fax: 510-380-0670
License Number: 861427

Project Cost Estimate

Prepared for: Matt David
Project: 199 Santa Rosa, Sausalito, CA

Prepared by: Mike McDonald
Date: April 24, 2010
Proposal No: 199.PGE.002

	SCOPE OF WORK	COMMENTS
	INSTALLATION OF CODE COMPLIANT CONCRETE STAIR CASE FOR PGE METER REPAIR ACCESS	
1	EXCAVATION, AND OFF HAUL OF SOIL FOR STAIR FOOTINGS	
2	FORM AND POUR LANDINGS AND STAIRS FROM STREET ABOVE TO PGE METER LOCATION AT SW CORNER OF HOUSE	
3	INSTALL CODE COMPLIANT GUARD RAIL AND HAND RAILS	
4	PERMITS AND PLANS BY OTHERS	

	ESTIMATE SUMMARY	
	SUBTOTAL ESTIMATE:	$18,650
	OVERHEAD @ 10%	$1,865
	SUBTOTAL	$20,515
	PROFIT @ 10%	$2,052
	TOTAL	$22,567

PAYMENT OF $1,000 OR 10% OF CONTRACT AMOUNT, WHICH EVER IS LESS, DUE UPON SIGNATURE OF FORMAL CONTRACT. BALANCE DUE UP ON COMPLETION OF WORK.

IF THIS PROPOSAL IS ACCEPTABLE, PLEASE INDICATE BY SIGNING BELOW, FAXING BACK TO US, AND WE WILL ISSUE A FORMAL CONTRACT FOR EXECUTION.

AGREED: ______________________

OWNER'S NAME: ______________________

DATE: ______________________

38 57

57 63

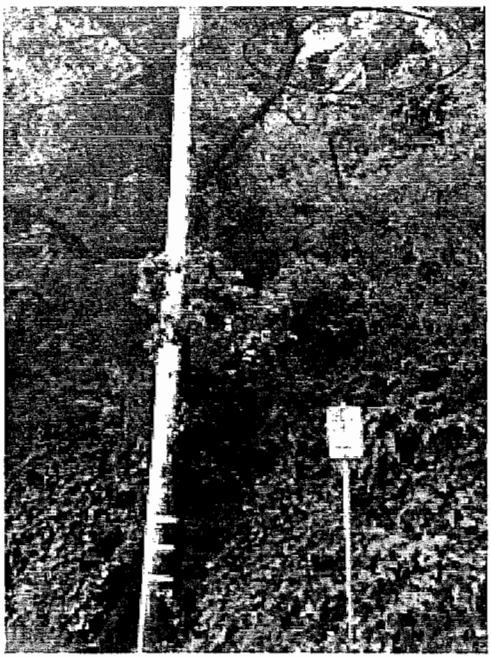
REASON #5 for Request for a Variance – HILL EROSION CONCERNS and DIFFICULT JOB overall.

The property of 199 Santa Rosa is on a very steep hillside, at 53° slope. It is treacherous terrain, with much rock, thick brush, poison oak, and areas of unstable hillside. A lot of trenching would be going through rock. Additionally, there are hill erosion concerns all along this private road of addresses 187, 191,195,199, 203, 207, and 211 Santa Rosa Avenue. We can't imagine that the city of Sausalito would want to further jeopardize this fragile hillside. See information from Soil engineer, and see photos to follow showing condition of property, slope and hillside.

looking down hill, down path of trenching, through the trees, to the pole circled in red.

Looking west toward SW corner of house, slope above house where stairs would be.

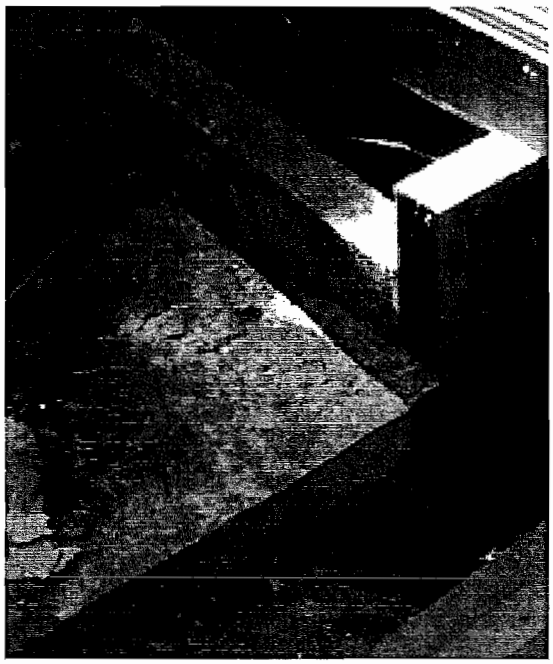
side view under house looking west toward trenching area



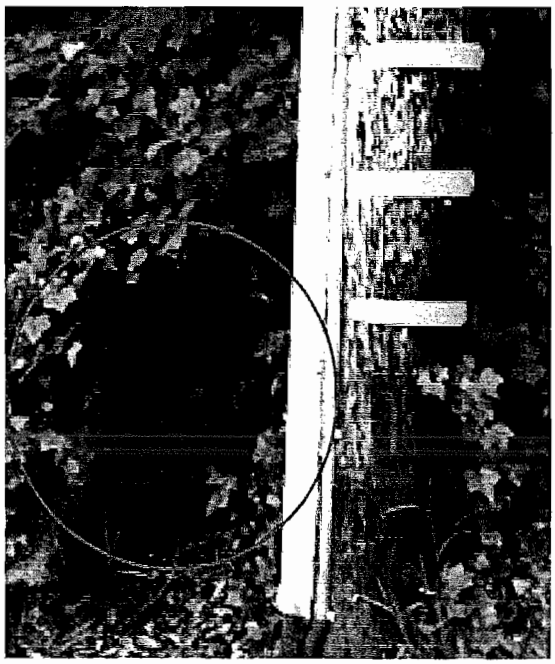
Looking uphill from pole toward thick brush - this is the path of the trenching. Note house, way above, circled in red. Treacherous hillside.

5A 6/9

50- year old japanese established garden that would be compromised with the proposed trenching



Existing concrete walls and footings in the way of PGE proposed plan



Rock/Limestone surrounding Pole that would have to be bored through to trench up the hill

Rock/Limestone surrounding Pole that would have to be bored through to trench up the hill

5A 5/10

Erosion above 199 Santa Rosa Ave

Erosion above 195 and 199 Santa Rosa Ave

Erosion above 199 Santa Rosa Ave

Erosion below 187 Santa Rosa Ave

5A SA 71

Erosion below 203, 207, 211 Santa Rosa Ave

Erosion below 203, 207, 211 Santa Rosa Ave

Erosion below 203, 207, 211 Santa Rosa Ave

Erosion below 203, 207, 211 Santa Rosa Ave

5A 5A
42 72

REASON #6 for Request for a Variance – SAFETY ISSUES AND CONCERNS TO WORKERS

Due to the conditions of the property, there are major Safety Issues/Concerns for those performing this treacherous work. Neither the owner, nor the contractor can take on this liability.

REASON #7 for Request for a Variance – CONTRACTOR PERFORMED WITHOUT OUR KNOWLEDGE

As mentioned in the previous sections, the original contractor (who we are about to begin a lawsuit against) performed the work without our knowledge. We have been damaged immensely already for their negligence.

REASON #8 for Request for a Variance – CODE CONFLICTS

The code itself states: "*...shall be placed underground in order to promote and preserve the health, safety and general welfare of the public...*". However, with this line of thought, keeping the old box would've been a huge safety issue. In fact, we believe the city should be embracing and promoting the replacement of old, unsafe boxes.

Moreover, and specific to this project, placing our service underground according to PGE's plan does not preserve the health and safety of the people living in the home. Instead, it puts the owner at great danger.

Additionally, the code states that the 2 reasons for the code are for: 1) aesthetic improvement and 2) resilience of electrical lines/service. Yet in this case, placing the electrical service underground accomplishes neither (especially since the city has no scheduled plan for removal of the pole). The power lines on our property are already underneath a canopy of trees and there is no visibility of these electrical lines by our neighbors. (refer to photos prior showing the thick landscape of hillside from pole to house).

SUMMARY:

In summary, for all of the reasons stated in this report, we seek a variance from the city. We are at the end of our project and putting this service underground would create significant health dangers and risk making our home uninhabitable for us, and create financial hardships beyond what we can manage, without collapsing the project entirely.

5A 5A
43 B

OUR PROPOSAL:

ALTERNATE ELECTRICAL PLAN IN PAGES TO FOLLOW.

(THIS IS THE PLAN PROPOSED BY JP ELECTRICAL,
AND APPROVED BY THE EMF CONSULTANT, STEPHEN SCOTT).

PLAN: IT WAS DISCOVERED THAT THE EXISTING WEATHERHEAD AND LINES ARE LOCATED IN AN UNDESIRABLE LOCATION, AS THEY EXIST WITHIN THE LIVING SPACE, WHICH WILL AFFECT THE HEALTH AND SAFETY OF THE INHABITANTS.

WE ARE REQUESTING TO MOVE THE WEATHERHEAD TO THE EAST VERTICAL POST NEAREST THE EXISTING SERVICE DROP, AND LOWER TO A MINIMUM OF 8 FEET BELOW THE LIVING SPACE, WHILE STILL KEEPING OVERGROUND. THE CONDUIT WOULD FOLLOW THE HILLSIDE UP THE HILL UNDER THE HOUSE AND THEN 90° WEST BACK UNDER THE HOUSE (WHILE STILL MAINTAINING THE 8 FEET) UNTIL REACHING THE CURRENT BOX IN THE CARPORT. (SEE STEPHEN SCOTT'S LETTER DESCRIBING EXACT PLAN).

THIS PLAN:

01) DOES NOT REQUIRE TRENCHING ON THE TREACHEROUS HILLSIDE
02) DOES NOT AFFECT ANY NEIGHBORS
03) DOES NOT AFFECT AESTHETICS OR PUT LINES IN NEIGHBORS VIEW
04) DOES NOT REQUIRE GOING UNDERGROUND AND THE RISKS AND COSTS ASSOCIATED WITH THAT
05) DOES NOT REQUIRE A SECONDARY BOX
06) DOES NOT REQUIRE A STAIRCASE DOWN TO NEW BOX
07) DOES NOT REQUIRE TRENCHING THE COMPROMISED HILLSIDE
08) DOES NOT RISK THE HEALTH OF THE INHABITANTS, BUT INFACT PROTECTS THEIR SAFETY
09) DOES NOT DELAY THE PROJECT OR PUT THE COMPLETIION AT RISK
10) DOES NOT PUT THE OWNERS INTO MORE FINANCIAL HARDSHIP

----→ TOTAL COST $4445
----→ TIMELINE: CAN BEGIN IMMEDIATELY AND WON'T HOLD BACK PROJECT COMPLETION
----→ RISKS: NO HEALTH RISKS TO OWNERS, WORKERS, OR HILLSIDE

5/4 5/4/14

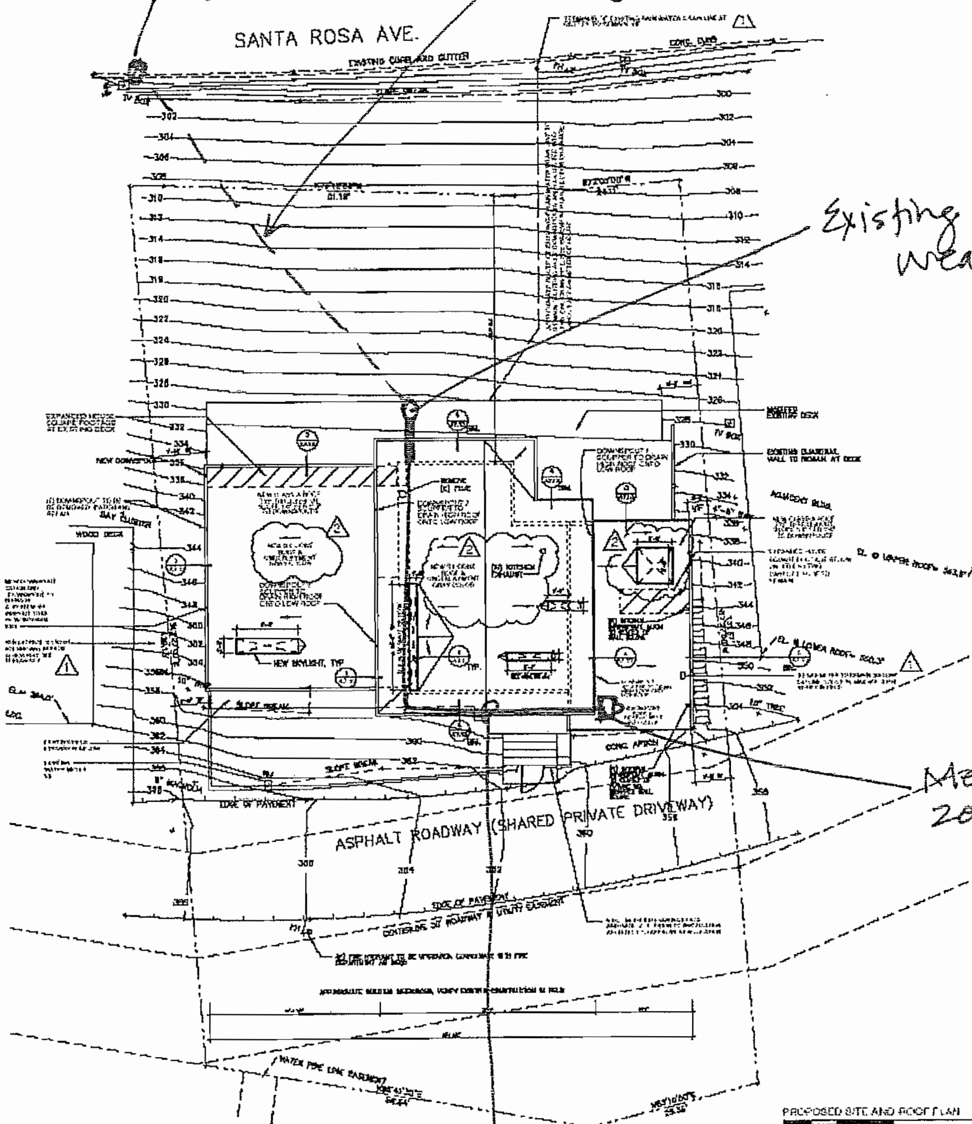
Electrician / EMF Proposal

A) Existing Condition

Utility Pole

existing overhead utility.

Existing Location Weather Head.



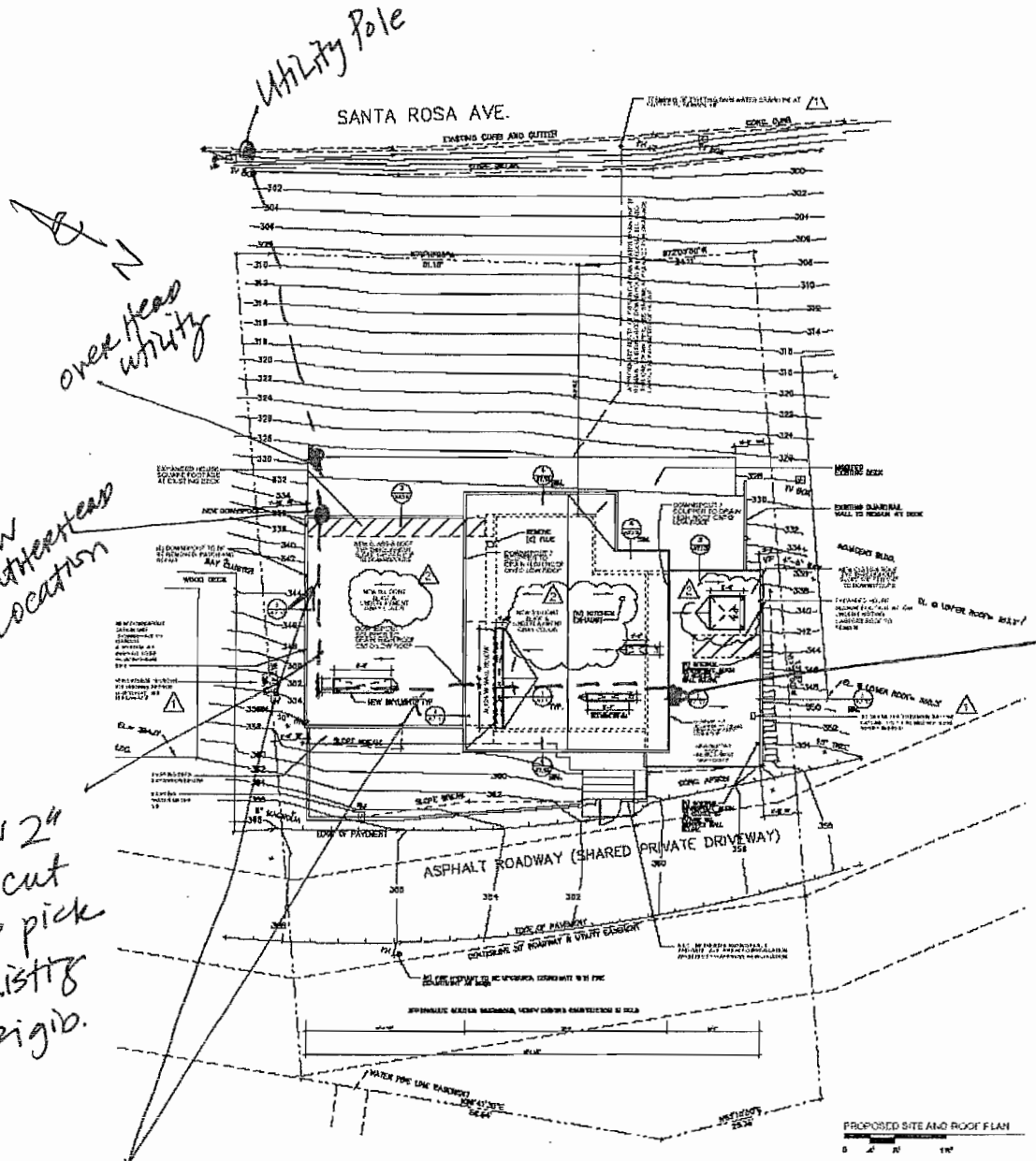
Meter Location 200 Amp.

Existing 2" Rigid

5A
75

Electrician / EMF Proposal

(B) Proposed Plan – Move Weatherhead to EMF safer location



Conduit secured under house and maintains MIN 8-10 feet from floor at all times.

5/46 SA 76

Stephen Scott
42 Maybeck St Novato, CA 94949
Tel: 415 328-8650 Fax 415 634-3201
California State Contractors License No. B, C-10 582235

November 20, 2009

Renee Rech
Renee Rech Design, Inc
199 Santa Rosa Ave
Sausalito, CA
E-mail: Reneerech@reneerechdesign.com

Re: Memo Re-routing electric service feed at 199 Santa Rosa Ave. Sausalito, CA

Dear Renee,

On November 2, 2009, I visited the project site to evaluate the potential EMF impact of the existing electrical service feed. A combination of visual inspection and EMF measurements indicated that the existing route presented an EMF exposure hazard in the office and child's bedroom areas. Accordingly, a new route for the feed was developed utilizing the understructure of the building that maintain a distance of 8 feet or greater between the feed the living space except at the bottom of the stairway near the car port. The new route was demonstrated in person to Chris of McDonald Construction and yourself.

It is recommended that the new service drop attachment occurs on the vertical post nearest the existing service drop, at the first intersection of horizontal bracing, proceeding from the weather head in a horizontally attached 2 inch rigid conduit along the double beam horizontal brace (toward the front of the house). The two inch conduit then travels upwards along the first 45 degree brace to a second horizontal run in the same direction. At a point approximately 2 feet from the retaining wall plane, the conduit turns left and is then suspended above grade by super strut and hangers from the structure above towards and then turning up and into the existing load center in the carport. This recommended routing plan will achieve the maximum reduction in EMF exposure within the conditioned space and is expected to be approved by utility and administrative authority in Sausalito.

In addition, a NET current of 2.5 amps was discovered on the existing sub-feed due to neutral current leakage to ground at the load center. It is further recommended the electrician of record re-build the service grounding system as per NEC and local ordinances and monitor possible stray current on the grounding conductor with a clamp-around ammeter.

5A 5A
47 77

Please feel to contact Stephen Scott at 415 328-8650 if you have any further questions.

Regards,

S. Scott

Jean Paul Fisher Inc.

Electrical Contractor
2218 Brittany Lane
Martinez, CA 94553

Estimate

Date	Estimate #
12/15/2009	09-059

Name / Address
McDonald Construction Sausalito Residence 199 Santa Rosa Ave Sausalito, CA 94965 Vnet

Project
Sausalito Residence

Description	Qty	Cost	Total
Labor Relocation of 2" conduit for main service.		2,500.00	2,500.00
2' ridged conduit	8	46.50	372.00
3/0 THHN Copper wire	330	3.30	1,089.00
Channel Strut 13/16	20	19.97	399.40
Strut hardware	1	85.00	85.00

Subtotal	$4,445.40
Sales Tax (9.0%)	$0.00
Total	$4,445.40

Phone #	Fax #	E-mail
(925) 323-6099	925-229-2790	jpfisherelectric@yahoo.com

5A/5A
4/9 79

CITY OF SAUSALITO

CONSTRUCTION PERMIT APPLICATION

(415)289-4100

NOTE:
CUTTING OR REMOVAL OF TREES PROHIBITED WITHOUT A TREE CUTTING PERMIT

NOTE:
ORD. 851 REQUIRES ANY RELOCATION, UP-GRADING, OR NEW ELECTRICAL SERVICE TO BE FED UNDERGROUND UNLESS A VARIANCE HAS BEEN GRANTED.

DO NOT WRITE IN SHADED AREA

Project Address 199 Santa Rosa

Owner:
Name MATTHEW DAVID
Address 199 SANTA ROSA Phone 415.577.9066
City SAUSALITO State/ZIP CA 94965
Fax No. 925.685.3383

Architect or Engineer of Record **Other:**
Name AIDLIN DARLING DESIGN License # C18109
Address 500 3RD ST. #410 Phone 415.974.5603
City SAN FRANCISCO State/ZIP CA 94107
Fax No. 415.974.0849

Contractor:
I hereby affirm that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.
State License # 759444 Class ___ Exp. Date ___
City Business License # C4587
Name FUSION BUILDING COMPANY
Address PO BOX 657
City BOLINAS State/ZIP CA 94924
Phone 415.868.0647
Emergency Phone ___ Fax No. ___

WORKERS' COMPENSATION DECLARATION

I hereby affirm under penalty of perjury one of the following declarations:

___ I have and will maintain a certificate of consent to self-insure for workers' compensation, as provided by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued.

✓ I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

CARRIER: AN INSURANCE
POLICY NUMBER: 46.070447.01025
[This section need not be completed if the permit is for one hundred dollars ($100) or less.]

___ I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California, and agree that if I should become subject to the workers' compensation provision of Section 3700 of the Labor Code, I shall forthwith comply wit those provision.

WARNING: FAILURE TO SECURE WORKERS' COMPENSATION COVERAGE IS UNLAWFUL, AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS ($100,000), IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST, AND ATTORNEY'S FEES.

Signature [signature] Date 4/4/07

OWNER BUILDER DECLARATION

___ I hereby affirm that I am exempt from the Contractor's License Law for the following reasons [Sec. 7031,5 Business and Professions Code: Any city or county which which requires a permit to construct, alter improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code) or that he is exempt therefrom and the basis for alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars ($500).]:

___ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractor's License law does not apply to owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale.)

___ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License Law.)

Date Owner

I certify that I have read this application and state that the above information is correct. I agree to comply with all city ordinances and state laws relating to building construction, and hereby authorize representatives of this city to enter upon the above mentioned property for inspection purposes.

[signature] 12.21.06
ture of Applicant or Agent Date

PERMIT IS VOID IF WORK HAS NOT BEGUN WITHIN 180 DAYS

PERMIT NO. DATE

BUILDING OFFICIAL DATE

DATE RECEIVED 12/21/06 PLAN CK# 06-43

ASSESSOR'S PARCEL NO. 065-118I-19

TYPE OF PROJECT		CLASS OF WORK
☒ SFD	☐ SITE WORK/GRADING	☐ NEW
☐ ACCESSORY STRUCTURE	☐ RETAINING WALL	☒ REMODEL
	☐ DECK/PATIO	☐ ADDITION
☐ DUPLEX	☐ SPA/POOL	☐ REPAIR
☐ APARTMENT	☐ SIGN	☐ MOVE
☐ CONDOMINIUM	☐ HOUSEBOAT	☐ DEMOLISH
☐ COMMERCIAL	☐ PIER,DOCK,FLOAT	☐ RE-ROOF

WORK DESCRIPTION
SINGLE FAMILY RESIDENCE REMODEL.

Will any trees be trimmed, cut or removed in order to proceed with the proposed construction? ___ yes X no

TOTAL COST OF CONSTRUCTION $ 397,500

FEES

BUILDING PERMIT	$ 1719.75	Cost of Subcontract Work & Fees	
BUILDING PLAN CK	$ 1247.85		
ZONING PERMIT	$ 323	ELECTRICAL COST	$ 3565
DEPOSIT	$ 1	FEE	$ 210
PLAN STORAGE	$ 127.50		1830
CONSULTANT	$	PLUMBING COST	$ 1375
PENALTY	$ 917	FEE	$
ENERGY	$		7105
CA SEISMIC TAX	$ 238.50	MECHANICAL COST	$
CONST. FEE	$ 3378	FEE	$ 341
INVESTIGATION	$	OTHER RECEIPT	$
DEMOLITION	$	PLAN CK RECEIPT	$ 1247.85
GRADING	$	TOTAL RECEIPT	$
AMOUNT PAID	$		
CREDIT	$		
TOTAL DUE	$ 7392.50		

ENGINEERING/PLANNING/ZONING APPROVALS

	FILE NO.	DATE APPROVED	PLANNER
ZONING PERMIT			
DESIGN REVIEW			
VARIANCE			
CUP			
HIST. LANDMARKS			
ENCROACHMENT			
ADMINISTRATIVE			
ZONING ADMIN.			
FLOODPLAIN ADMIN			
GRADING			

ZONING ___
EXIST. USE ___
NEW USE ___
EXIST. UNITS ___
NEW UNITS ___
TOTAL UNITS ___

ZONING OFFICIAL BY ___ DATE ___

ADDITIONAL REQUIREMENTS/NOTES

SA 81
SA 80

CONSTRUCTION PERMIT APPLICATION
CITY OF SAUSALITO

420 LITHO STREET
SAUSALITO, CA. 94965
415.289.4100

CUTTING OR REMOVAL OF TREES PROHIBITED WITHOUT A TREE CUTTING

ORD. 851 REQUIRES ANY RELOCATION, UP-GRADE, OR NEW ELECTRICAL SERVICE TO BE FED UNDERGROUND UNLESS A VARIANC HAS BEEN GRANTED

Project Address 199 SANTA ROSA | **Type Street** Avenue | **Apt, Unit, STE** | **Plan Check No.** 06-365

Type of Project SFD | **Submittal Date** 12/21/2006

Class of Work Remodel | **Assessor Parcel No.**

Project Description

REMODEL
extend 1st inspecttion until 4/4/08 FUSION BUILDING REMOVED FROM CONTRACTOR 3/3/08

A or E of Record Architect | **Company or Last Name** ADLIN DARLING DESIGN | **Lic. No.**

Address 500 3RD ST #410 | **Phone No.** 974-5603 | **Fax No.** 974-0849

Owner Last Name DAVID | **Owners First Name** MATTHEW

Owner Address 3020 BRIDGEWAY #105 | **Owner Phone** 577-9066

Owner City Sausalito | **Owner St** Ca | **Owner Zip** 94965

Contractor Name MCDONALD CONSTRUCTION (as of 9/29/09) | **Contractor Lic No.** B 861427

Contractor Address 5950 MARGARIDO DR., OAKLAND, CA 94618 | **Contractor Phone** 510-550-4966

Workers Comp Company EXEMPT | **Contractor Fax** 510-380-0670

Workers Comp Policy No. | **Cont Emergency Phone**

PLANS? ☒ **YES** ☐ **NO**

	Building Permit No.	Date Building Permit Issued	Total Cost of Construction
	BEPM 07678	09/04/200	$397,500

Related Permits			
	BEPM 07678	09/04/200	$397,500

5A/51 5A 82

COUNTY OF MARIN our mission is excellent service

Enter Keyword to Search Our Site

COUNTY HOME
BOARD OF SUPERVISORS
CONTACTS
DEPARTMENTS
JOB POSTINGS
MY MARIN
SERVICES & INFORMATION
DOING BUSINESS
GOVERNMENT
LIVING HERE
ONLINE SERVICES
VISITING
Calendar
County News
Forms
Full Text Search
Subscribe
Give Us Feedback

Assessor-Recorder - Property Inquiry Details

Home Contact Us Services Organization Forms News Jobs Printable Format

Your Opinion Matters	
Consumer Scam Alert	Notice of Recording Fee Increase
Assessor Terminology	Recorder Terminology

Display Map Book

In order to view these maps, you must have Adobe Acrobat PDF viewer.
Get Adobe Acrobat PDF viewer

Parcel and Deed Information for Roll Year: 2009		
Parcel Number	**Property Start Date**	**Deed Reference Id**
065-181-19	November 11, 1911	05-083698
Roll Year	**As of Date**	**Extract Date**
2009	01/01/2009	August 21, 2009

Ownership Information			
Owner Sequence	**Owner Name**	**Percent**	**Capacity Cd**
0001	DAVID MATTHEW &	50	
0002	RECH RENEE	50	

Value and Assessment Event Information		
	Tax Roll Year	**Value**
Land	2009	1,045,282
Improvements	2009	516,420

Note: The owner and deed information above represents the assessor's current information.
The values above represent the preliminary or original bill values for the property.
The tax values below represent the original secured bill or subsequent revisions to that bill.
Data is updated monthly.

Property Tax Information				
Tax Roll Year: 2009		**Bill to:** DAVID MATTHEW & RECH RENEE		**Bill No:** 09-0116338
Fund Id	**Tax Rate**	**Fund Title**	**Contact Information**	**Amount**
		BASIC TAX		15,327.02
109163		CITY OF SAUSALITO-RUNOFF CHARGE	NBS (800) 676-7516	15.00
108934	.0039	MARIN COM COLLEGE2004-1 C-11/04	DEPT OF FINANCE TAX DIVISION (415) 499-6168	59.76
108945	.0153	MARIN COM COLLEGE2004-2 C-11/04	DEPT OF FINANCE TAX DIVISION (415) 499-6168	234.50
109192		MMWD-FIREFLOW	TERRY STIGALL (415) 945-1404	75.00
105110		MS MOSQUITO #1	MARIA GARCIA-ADARVE-SCI CONSUL (800) 273-5167	10.72
109253	.0185	SAUS GO BOND 2006 A&B SERIES	AUDITORCONTROLLER TAX DIVISION (415) 499-6168	283.54
105475		SAUS-MARIN CITY SANITARY	JOYCE KRUEGER (415) 332-0244	388.00
108942	.0085	SAUS-MARINCITY SCHBNDS-2006A&B	DEPT OF FINANCE TAX DIVISION (415) 499-6168	130.26
109009		SAUSALITO CITY	NBS (800) 676-7516	360.00
108936	.0153	SAUSALITO SCH BND'05 I-11/2000	DEPT OF FINANCE TAX DIVISION (415) 499-6168	234.50
			DEPT OF FINANCE TAX	

5A 52 5A 83

108922	.0102	TAM UNION H SCH BD'02 A-6/2006	DIVISION (415) 499-6168	156.32
108914	.0043	TAM UNION HIGH BD'01 A-03/2001	DEPT OF FINANCE TAX DIVISION (415) 499-6168	65.90
108932	.0112	TAM UNION HIGH BD'04 A-03/2001	DEPT OF FINANCE TAX DIVISION (415) 499-6168	171.66
108938	.0168	TAM UNION HIGH BND'06 A-6/2006	DEPT OF FINANCE TAX DIVISION (415) 499-6168	257.48
		Total Bill Charges:		8,724.74

Location Information	
Tax Rate Area	009000
Census Tract	130200
Supervisor District	3
Assessment City Code	SAS

Property Characteristics	
Construction Year	1960
Use Code	Single-Resid. - Improved 11
Living Units	1
Number of Bedrooms	3
Number of Bathrooms	3
Enrolled Acres	0
Land Sq. Ft.	10,320
Living Area Sq. Ft.	2,453
Garage Sq. Ft.	
Carport Sq. Ft.	363
Unfinished Sq. Ft.	
Deck/Patio Sq. Ft.	1,002
Pool Sq. Ft.	

The information has been extracted from the Assessor's Equalized Tax Roll and reflects the most recent tax bill.

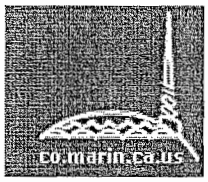
408.3. Property characteristics information; public records.

Except as otherwise provided in Sections 451 and 481 and in Section 6254 of the Government Code, property characteristics information maintained by the assessor is a public record and shall be open to public inspection.

For purposes of this section, property characteristics, includes, but is not limited to, the year of construction of improvements to the property, their square footage, the number of bedrooms and bathrooms of all dwellings, the property's acreage, and other attributes of or amenities to the property, such as swimming pools, views, zoning classifications or restrictions, use code designations, and the number of dwelling units of multiple family properties.

Notwithstanding Section 6257 of the Government Code or any other provision of law, if the assessor provides property characteristics information at the request of any party, the assessor may require that a fee reasonably related to the actual cost of developing and providing the information be paid by the party receiving the information. The actual cost of providing the information is not limited to duplication or production costs, but may include recovery of developmental and indirect costs, as overhead, personnel, supply, material, office, storage, and computer costs. All revenue collected by the assessor for providing information under this section shall be used solely to support, maintain, improve, and provide for the creation, retention, automation, and retrieval of assessor information.

The Legislature finds and declares that information concerning property characteristics is maintained solely for assessment purposes and is not continuously updated by the assessor. Therefore, neither the county nor the assessor shall incur any liability for errors, omissions, or approximations with respect to property characteristics information provided by the assessor to any party pursuant to this section. Further, this subdivision shall not be construed to imply liability on the part of the county or the assessor for errors, omissions, or other defects in any other information or records provided by the assessor pursuant to the provisions of this part.



The contact for this page is: **assessor@co.marin.ca.us**

5A/53 5A/84

Todd Teachout

From: Chan, Chris [C1Cj@PGE.COM]
Sent: Thursday, April 29, 2010 2:47 PM
To: Todd Teachout
Cc: Hayes, Patrick F
Subject: RE: Utility Lateral Question

Todd,

Once the conduit comes out of the ground, it needs to terminate at the panel or termination can. We can't connect to the weatherhead with an underground feed.

Chris Chan
Sr. Elec. Estimator
415-257-3384

From: Todd Teachout [mailto:tteachout@ci.sausalito.ca.us]
Sent: Tuesday, April 27, 2010 5:19 PM
To: Hayes, Patrick F; Chan, Chris
Subject: Utility Lateral Question

Pat and/or Chris:

We just got a utility undergrounding variance application. 199 Santa Rosa. The applicant has a financial issue and a health issue.

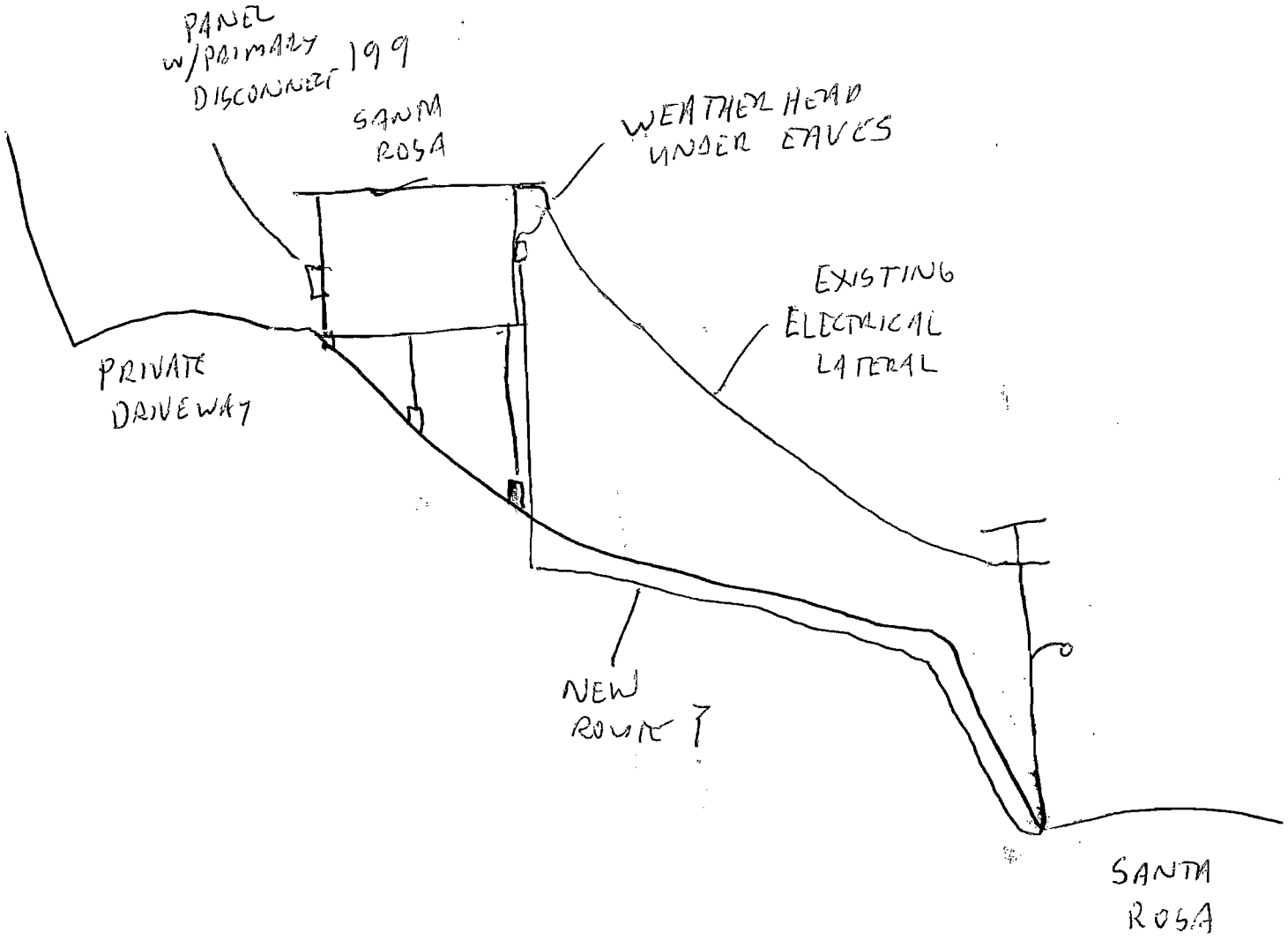
The applicant is remodeling their home. The home is physically higher than the electrical distribution line so the lateral service hangs between a weather head under the eave, street side, and the power line in the street.

At some point in the process the old panel was replaced. I don't know where it had been located but the new 200 amp panel currently is located at or near a garage accessible from a private driveway. The existing lateral service seems to be routed through a shielded grounded conduit running in the roof/ceiling system.

I would like to know it a lateral can be run from the weatherhead, to conduit mounted against the building then into the ground down to Santa Rosa. The applicant is representing that PG&E won't allow such routing. If it is possible from a PUC and electrical code standpoint I'd like to know. I'm attaching a schematic. I'm also attaching existing and proposed plan from the variance application.

Todd Teachout
City Engineer
City of Sausalito
420 Litho Street
Sausalito, CA 94965
(415) 289-4111 (voice)
(415) 339-2256 (fax)

SA 85


PANEL
W/PRIMARY
DISCONNECT
199
SANTA
ROSA
WEATHER HEAD
UNDER EAVES
EXISTING
ELECTRICAL
LATERAL
PRIVATE
DRIVEWAY
NEW
ROUTE 7
SANTA
ROSA

5A
86

5A
84

developmental exposures to electromagnetic radiation may help explain the dramatic recent increase in autism.

5. A Physician Petition: the Freiburger Appeal. Doctors unite to express concern for health effects of mobile phone technology.

6. Electrical Sensitivity. Arthur Firstenberg and Susan Molloy. The founder and director of the *Cellular Phone Taskforce* (Firstenberg) and cofounder of the *Environmental Health Network* (Molloy) provide a concise, referenced article on this emerging condition. (From ***Latitudes***, Volume 5 #4)

Electromagnetic Field Exposures and Health Problems
Robert Riedlinger
Sunday, 10/21/01

I have been researching the effects of EMF on health for the past five years, and I will send information to anyone that asks. I firmly believe that many of our health problems are directly related to EMF in our atmosphere by radio, TV and cell phone towers. There are many scientific studies that support my theory. I say this from a personal experience of living close to a cell phone TV, and FM radio tower.

Regards Robert Riedlinger
E-mail: rriedlin@telus.net

2 Newsletter

"No Pace to Hide" Newsletter. Published bi-annually. *$25.00 for subscription and membership with* ***Cellular Phone Task Force.*** Information on health and environmental effects of wireless technology. Advocacy and support for electrically sensitive individuals. Arthur Firstenberg, Cellular Phone Task Force, P. O. Box 1337, Mendocino, CA 95460
Phone: 707-937-3990

3 Equipment

Trifield meter with 100x external probe: **Alphalab. 801-487-9492.** Salt Lake City, Utah.

4 EMF Control for Homes

Q I just talked to an MCS/EMS in my area. She has noticed that she's been getting more electrically sensitive (ES) in the past year, and is wondering if her house is contributing. She' has just moved into the house last year. She does well in this area with her multiple chemical sensitivity (MCS), but complains that the hot dry winds here, bother her electrical sensitivity. She's plans to ground her new metal roof and bed. She's waiting for further instructions from an electrician about the size of the wire needed to ground the roof. She cannot use a computer any more, or watch TV, as of just a few months ago. She's going to ground her bed with some type of material that seems like vinyl that she sends away for. That's all I know about that. Do you have any suggestions for her?

A The grounding of the roof and bed will do nothing. If there is not a transmitter (cell phone or radio) near her, I'd guess that she has some wiring errors in the house or a very bad ground current problem. This is the cause of electro magnetic field (EMF) sensitivities more often than any other cause.

In order to fix these problems, she mist have a cooperating electrician who will read a small paperback book on correcting wiring problems. ***Tracing EMFs in Building Wiring and Grounding,*** by Carl Riley, **TRACING**

5A 87

EMFs (Cat. #A530) can be purchased at http://www.lessemf.com Click on "How to Guides." This does not imply that other products or advice at lessemf are appropriate.

The electrician does not have to be a licensed electrician, but must be very familiar with residential house wiring. Someone can check the place for bad wiring problems by turning on something on every circuit, and taking magnetic field readings in the house. These should be corrected urgently. Temporarily, some circuits can be not used to immediately reduce her daily exposures. Isolating the problem circuits is fairly fast, finding the box with the error can take longer.

To correct ground current problems, the Trifield meter with 100x external probe is the only instrument sensitive enough to work. These are the magnetic fields left when the power panel is off, caused by bad neutral quality from the power company, and their Wye power distribution system grounding practice.

To obtain a ***Trifield meter with 100x external probe:*** **Alphalab. 801-487-9492.** Salt Lake City, Utah.

Ground current problems can be corrected, often, if the home is near the end of the power grid. In suburban settings, it usually cannot be corrected, since it would require a complete grounding system change for all the homes in that vicinity.

Most of the time, a fairly rapid onset of Electrical Sensitivity (ES) is due to a house where the living areas and bedroom are at or above 2 milligaus. If the problem isn't resolved in time, the ES is permanent. Recovery will take place slowly over 1-3 months. How much depends on how long the high level exposure went on, and the condition of the individual. She needs to do this.

This might be very useful for your friend, too. Karl is very good. This is excellent.
http://www.dhs.cahwnet.gov/ehib/emf/a_wiring_video.html

Top 15 Checklist for EMF Housing

1. Locate power panel at least 10 feet from living/sleeping areas. The best solution is to use a pedestal type panel located 8 feet from the house.

2. Locate hot water heater (electric) at least 10 feet from living/sleeping areas. Make sure the wires between the upper and lower elements are not spread apart. Pull a new pair through the insulation if they are.

3. Locate clothes dryer 14 feet from living/sleeping areas.

4. Use a ceramic top electric range (lower EMF and less burnt oils) and locate it 14 feet from a living/sleeping area, exempting the kitchen, of course. An electric oven will be unusable due to the element configuration. (25 foot radius impacted). A toaster oven is bad but less so, an outdoor gas oven would be ideal.

5. If there is no aluminum foil vapor barrier which can be used as an electrostatic shield, wiring should be in ***EMT conduit***, a thin walled, galvanized steel tubing that is used in commercial electrical wiring. Wires should be cut to length 25% longer than needed, twisted with a drill before being pulled. The individual circuit pairs are twisted if larger conduits with multiple circuits are used. Ground wires should be used, don't use EMT as the sole ground conductor.

6. If a foil barrier is present which can be used as an electrostatic shield, use 12-3 Romex (lazy twist) and don't use the extra wire and make sure that the wire to the clothes dryer, oven and hot water heater has a lazy twist (round not flat).

7. Have a dedicated circuit to any electronics, such as computers. This should be in conduit or at least metal clad. Keep the routing of this circuit away from critical areas like the bedroom of someone with ES, if this is a family

dwelling.

8. Use no dimmers, no fluorescent, ***High Intensity Lighting (HID)***, Metal Halide, arc lamps, or any other lighting besides conventional line voltage incandescents.

9. Most new ***Ground Fault Interrupter (GFI)***'s are now constant ***Electro Magnetic Interference (EMI)*** generators. Cooper brand ***GFI*** units are ***EMI*** free and should be used for anyone with MCS/ES.

10. All water pipes extended through the house wall must be PVC to prevent stray ground current paths on water pipes. A short section of PVC is sufficient in retrofits, as close to the house as practical.

11. Any cable lines within the house should be in ***EMT*** or preferably rigid conduit. Minimize these. Digital cable has become a big problem for ES folks and areas with same are poor sites for those with ES.

12. Phone lines should be either double shielded cable (heavy braid over foil) or run in ***EMT*** conduit. ***DSL*** introduces much the same problem as digital cable as far as site selection.

13. Site selection: 5 miles from nearest cell phone or other radio, TV, etc. transmitter. Background magnetic field levels should be tested with power off. Shared transformers should be avoided, due to net neutral current problems between homes.

14. Wiring must be tested for net current: Each neutral conductor in the panel must be disconnected, and then continuity tested against the remaining bussed neutrals. Any shorts (common neutral connections) must be located and corrected. Common neutral connections between circuits will not trip the breakers. Each 120v hot breaker must be continuity tested (all breakers switched open) against all others for a common hot connection. Same phase common hot errors will not trip the breakers.

15. Check and correct wiring errors to dual 220/110v devices: stove and dryer. Stove and dryer must be configured to have a separate ground, and isolation between ground (chassis) and neutral.

Videos

Fixing Electric Wiring in Schools: A Video. **California EMF Program.**

Due to public concern regarding electric and magnetic field (EMF) exposure and children's health, the California EMF Program has focused attention on EMF in schools. To determine EMF levels and sources in California public schools, the California EMF Program conducted the California School Magnetic Field Exposure Assessment Survey. While collecting EMF measurements for this survey, it was discovered that many of the 89 schools surveyed had improperly connected electrical wiring. Not only are these wiring errors the most common source of elevated magnetic fields in schools, but they may violate state and local electrical codes and could be a potential fire hazard.

It is currently unknown whether EMF is a health hazard. However, by evaluating electrical breaker boxes, schools can determine whether their wiring violates electrical codes, and should, therefore, be corrected.
http://www.dhs.cahwnet.gov/ehib/emf/a_wiring_video.html

Suggested Protocol for School Electricians for Correcting Wiring Errors C ausing Net Current Magnetic Fields Wiring Protocol

To obtain a wiring video:
Karl Riley, RR-1, Box 361A, Edgartown, MA 02539. Phone: (508) 627-4719
kriley3@ix.netcom.com

5A/5A 57 89

5 EMF Control for Computers

2 Introduction to EMF

"EMF" is the expression commonly used when talking about "power-frequency electric and magnetic fields." Power-frequency electric and magnetic fields are a natural consequence of the flow of electricity. The strength of electric and magnetic fields can either be measured using a gaussmeter or estimated using formulas factoring in voltages, currents, and system designs.

Electric fields are produced by the voltage on a conductor and rapidly decrease with the distance from the source. The electric field can easily be shielded by trees, fences, buildings, and most other structures. The strength of the electric field is a function of system design and the magnitude of the voltage level. Electric fields are measured in units of kiloVolts per meter (kV/m).

Magnetic fields are produced by the current in a conductor. They also rapidly decrease with distance from the source. Magnetic fields are much more difficult to shield than electric fields. The strength of the magnetic field is a function of system design and the magnitude of the current. Magnetic fields are measured in units called milliGauss (mG).

Although the term EMF includes both electric and magnetic fields, the focus of the California EMF Consensus Group and the California Public Utilities Commission in Decision 93-11-013 has been on magnetic fields. SCE's Design Guidelines are exclusively applied to consideration of magnetic fields. While the fields from each power line will vary depending on load, design and other factors, examples of possible magnetic field levels that could be found near different voltages of power lines are shown in Table 2.1.

Table 2-1 Example of Power Frequency Magnetic Fields from Electric Power Lines

Source of Magnetic Fields	Distance from Source or Location	Magnetic Fields (mG)
500 kiloVolt Transmission Line	Edge of Right-of-Way	30
230 kiloVolt Transmission Line	Edge of Right-of-Way	14
66 kiloVolt Transmission Line	Under the Line	13
12 kiloVolt Distribution Line	Under the Line	7

Figure 2.1 shows examples of sources of magnetic fields in and around a residence. These sources also exist in and around other buildings, such as schools, offices, stores, and businesses. Electric and magnetic fields can be detected and measured near internal wiring, electrical appliances, water pipes, and wherever electrical voltages and currents are present.

Figure 2-1 Sources of Magnetic Fields

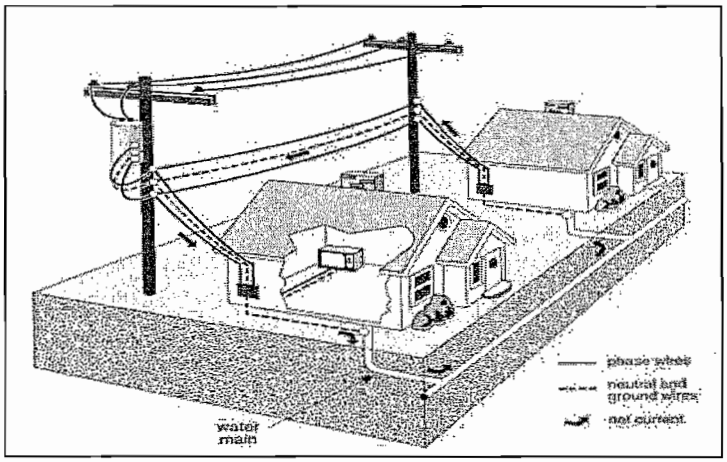


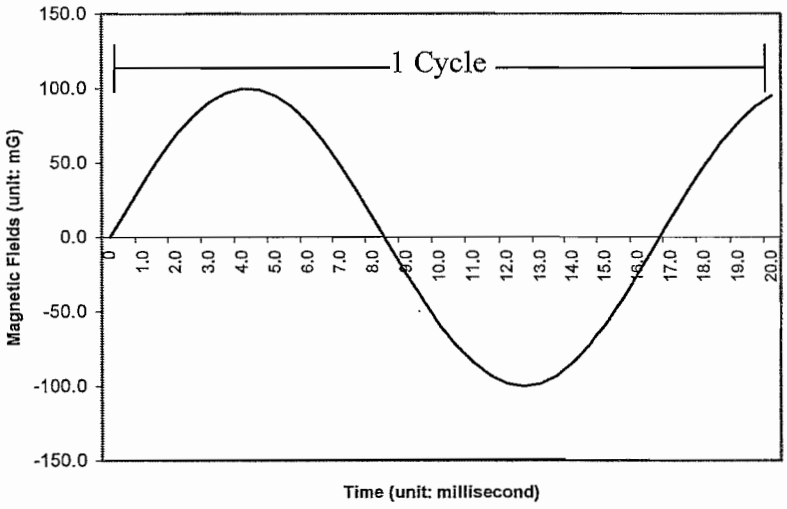
Table 2-2 Magnetic Fields from Electrical Appliances[3]

Appliances	Magnetic Fields (milliGauss)			
	6 inches	1 foot	2 feet	4 feet
Hair Dryers	700	70	10	1
Electric Shavers	600	100	10	1
Blenders	100	20	3	-
Can Openers	1500	300	30	4
Microwave Ovens	300	200	30	20
Refrigerators	40	20	10	10
Washing Machines	100	30	6	-
Vacuum Cleaners	700	200	50	10
Power Saws	1000	300	40	4
Drills	200	40	6	-
Copy Machines	200	40	13	4
Fax Machines	9	2	-	-
Video Display Terminals	20	6	3	-
Electric Pencil Sharpeners	300	90	30	30

Table 2-2 shows magnetic field strength levels for various household and business appliances, ranging from 1500 mG for a can opener to nearly non-existent amounts as one moves away from the source. Magnetic field strength levels decrease quickly as the distance from these appliances increases. Figures represented in the table are provided by the National Institute of Environmental Health Sciences and the U.S. Department of Energy[3].

The magnetic fields produced by power lines have properties similar to those of the Earth's magnetic field (the Earth's magnetic field ranges from 380 mG to 560 mG). The field has direction, polarity (+ or -) and magnitude (strength). However, unlike the earth's magnetic field, power line magnetic fields change magnitude and polarity with time, as illustrated in Figure 2-2.

Figure 2-2 "Power Frequency (60 Hz)" Magnetic Fields



The "power-frequency" magnetic field, just like the AC electric current that produced it, makes one complete positive polarity/negative polarity cycle in 16.67 milliseconds, or 60 complete cycles per second. The field thus has a frequency of 60 cycles per second, or 60 "Hertz."

[3] Source: *Questions and Answers About EMF: Electric and Magnetic Fields Associated with the Use of Electric Power*, National Institute of Environmental Health Sciences and U.S. Dept. Of Energy: Pages 33-35. June 2002

SA 91
5A
5/9

Power frequency magnetic fields can be measured by simple hand-held instruments or calculated using one of several available computer software programs. SCE uses EMDEX meters to measure magnetic fields. These instruments read the combination of the three axis of the magnetic field, or the "resultant", also known as "$\mathbf{B_{Resultant}}$". SCE also uses "**Fields**," and "**3D Fields**" programs for calculating magnetic fields. The "Fields" program gives both "B_{max}[4]" and "$B_{Resultant}$." SCE uses $B_{resultant}$ for evaluating "no-cost and low-cost" magnetic field reduction measures for electric power lines. When "3D Fields" are being used for substation projects, it calculates $B_{Resultant}$ only. In the EMF Design Guidelines, both B_{max} and $B_{resultant}$ have been used to demonstrate the intensity of magnetic fields.

[4] "Bmax" is the maximum phasor component of the magnetic field in a point in space and is represented by the magnitude and direction of the major semi-axis of the field ellipse. The ellipse axes correspond to the zero rate of change of the field magnitude with respect to the angle in space or with respect to time.

3 Purpose of EMF Design Guidelines

The California Public Utilities Commission adopted a policy where investor-owned electric utilities operating within the state agree to incorporate various "no-cost and low-cost" measures into the construction of new or upgraded power lines and substations (Decision 93-11-013). This decision also authorized each utility to develop and publish a set of "EMF Design Guidelines" implementing this policy. SCE periodically updates the EMF Design Guidelines to reflect current information. This update was done to capture the information that has resulted from the California Department of Health Services, Federal NIEHS EMF RAPID, World Heath Organization, IARC review, and U.K. NRPB EMF research reviews.

These EMF Design Guidelines are intended for new construction or major reconstruction of electric utility transmission, substation, and distribution facilities. They describe the methodology for evaluating "no-cost and low-cost" measures to reduce magnetic fields in new construction or major reconstruction. Their purpose is to give the designer the tools and knowledge necessary to assist in determining the most appropriate design for each application in a consistent manner. These guidelines are not applied to changes made in connection with routine maintenance, emergency repairs, or minor changes to existing facilities[5].

In summary:

- SCE is taking reasonable "no-cost and low-cost[6]" steps to build new electric utility lines and substations in ways that reduce magnetic fields in accordance with CPUC Decision 93-11-013[7];
- These guidelines have been updated to reflect new information from the CDHS, NIEHS, WHO, and NRPB EMF Program.

When applying these guidelines, the proposed electrical facility will be designed and routed consistently with existing SCE design, siting, construction, operation, and maintenance criteria. Design criteria may include aesthetic considerations where required by local code or to be consistent with existing electrical facilities in that geographic area. Certain magnetic field reduction measures such as line phasing, line routing, pole height, pole-head configuration, and location of substation equipment may be included in the preliminary design[8]. Some of these measures can be considered "no-cost" magnetic field reduction measures. This preliminary design can serve as the basis for the four percent (4%) cost benchmark used in the evaluation of further "low-cost" measures. The calculated field for the preliminary design can be served as the basis for the fifteen percent (15%) magnetic field reduction used to determine "noticeable reduction."

[5] The specific criteria for application of these guidelines are included in the respective Transmission and Subtransmission, Substation, and Distribution sections of this document.

[6] CPUC 93-11-013: "We direct the utilities to use 4 percent *(of the total cost of a budgeted project)* as a benchmark in developing their magnetic fields mitigation guidelines. We will not establish a 4 percent cap at this time because we don't want to arbitrarily eliminate a potential measure that might be available but costs more than the 4 percent figure. Conversely, the utilities are encouraged to use effective measures that cost less than 4 percent." (Section 3.3.2)

[7] California Public Utilities Commission, Order Instituting Investigation (OII) Decision 93-11-013, Dated November 2, 1993.

[8] Some magnetic field reduction measures could be "low-cost" measures depending upon the scope of the project.

SA 93

Over the years, many "no- and low-cost" measures have become standard design practice for SCE, especially for 66 kV and 115 kV electrical systems. Therefore, the preliminary designs submitted for review under the EMF Design Guidelines may already incorporate "no- and low-cost" magnetic field reduction measures and no further selection of "no- and low-cost" measures is needed.

SCE's first priority in the design of any electrical facility is public and employee safety. Without exception, design and construction of electric power system facilities must comply with all federal, state, and local regulations, applicable safety codes, and SCE construction standards. Furthermore, power lines and substations must be constructed so that they can operate reliably at their design capacity. Their design must be compatible with other lines in the area. They must result in reasonable costs to operate and maintain. These, and other requirements, are included in the existing CPUC regulations[9] and under SCE's construction standards. Any possible "no-cost and low-cost" magnetic field mitigation measures, therefore, must meet these requirements.

In summary:

- The use of these "no-cost and low-cost" methods will be governed by employee and public safety, good engineering practices, future system requirements, local conditions, economics, and reliability considerations; and

- SCE will revise the EMF Design Guidelines as more information becomes available.

[9] California's General Order 95, for example, establishes rules and specifications for the construction of overhead transmission and distribution lines in California.

5.94
5R 62

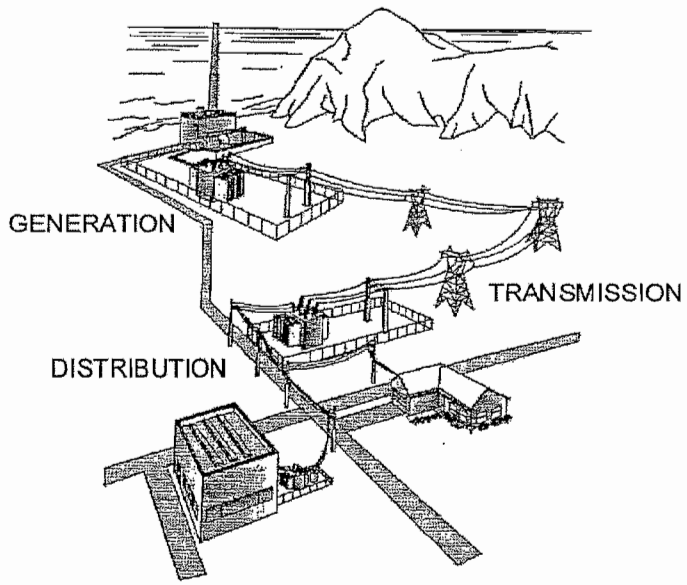
4 Understanding SCE's Transmission, Subtransmission, Substation, and Distribution Systems

4.1 SCE's Electric Power Lines

SCE classifies its electric power lines as transmission, subtransmission, and distribution, depending upon the line voltage. The transmission system generally includes lines where the voltage ranges from 161 to 500 kilovolts (kV); the subtransmission system includes lines from 50 kV through 161 kV; and distribution lines are those with voltages less than 50 kV.

SCE's electricity delivery system starts at a generating station. Transmission lines bring electricity to transmission substations. High-voltage power is carried from the generating station, using high-capacity transmission lines supported by above ground metal structures, with an exception of less than 2 miles of underground structure. The interconnection of transmission lines forms the major part of the power system network. Transmission lines in British Columbia (Canada), Alberta (Canada), Washington State, Oregon, Idaho, Montana, Wyoming, Nevada, Utah, Colorado, New Mexico, Arizona, and California are interconnected to deliver more reliable and stable electric power. At transmission substations, the voltage is reduced and routed in multiple directions by subtransmission lines. Subtransmission lines are constructed on wood poles or steel poles, or placed in underground structures. Subtransmission lines end at the facilities of large power users or at distribution substations. At distribution substations, the voltage is further reduced and delivered to homes and offices on wires supported by wooden poles or in underground structures. All components of the transmission, subtransmission, distribution, and substation systems that are "energized" (carrying electricity) create electric and magnetic fields. The system is shown graphically in Figure 4-1.

Figure 4-1 The Electrical Power System



5A 95
5A 03

5 "No-Cost and Low-Cost" Magnetic Field Reduction Measures

5.1 CPUC Decision

Design and construction of all transmission and subtransmission lines, and substations must comply with all federal, state, and local regulations, applicable safety codes, and SCE design standards. Any possible EMF mitigation measures, therefore, must meet these requirements. As supplement to this, the California Public Utilities Commission directed all investor-owned utilities in the state to take "no-cost and low-cost" magnetic field reduction measures for new and upgraded electrical facilities (CPUC Decision 93-11-013).

SCE defines "no-cost and low-cost" as:

- "No-cost" measures include any design changes that reduces the magnetic field in public areas without increasing the overall project cost;

- "Low-cost" measures are those steps taken to reduce magnetic field levels at reasonable cost. The CPUC Decision (93-11-013) states,

> *"We direct the utilities to use 4 percent as a benchmark in developing their EMF mitigation guidelines. We will not establish 4 percent as an absolute cap at this time because we do not want to arbitrarily eliminate a potential measure that might be available but costs more than the 4 percent figure. Conversely, the utilities are encouraged to use effective measures that cost less than 4 percent."*

The CPUC agreed that a "low-cost" measure should achieve some noticeable reduction, but declined to specify any numeric value. SCE uses a minimum fifteen percent (15%) reduction as the criteria for the application of "low-cost" measures.

5.2 Methods for Reducing Magnetic Fields

This section discusses methods that can be applied to reduce the magnetic fields from SCE's new electrical facilities. The cost of magnetic field reduction measures compared to SCE's standard construction practices for a particular project normally should not exceed four percent (4%) of the total cost of the project. The total project cost is based on all of the individual components of the entire project. For example, if the construction of transmission lines also involves the construction of a sub-station then the total project cost is the sum of both the transmission line and sub-station elements. The following methods for reducing magnetic fields apply to new electrical facilities:

1. Increasing the distance from the lines:
   - Increasing pole (structure) height,
   - Increasing the width of right-of-way, and/or
   - Locating power lines closer to the centerline of the corridor.
2. Reducing conductor (phase) spacing.
3. Optimizing phasing in a multi-circuit corridor.

SA

5A
64

4. Converting single-phase to split-phase circuits.
5. Placing facilities underground.

5.2.1 Increasing the Distance from Electrical Facilities

Reducing field strength by increasing the distance from the source can be accomplished either by increasing the width of the right-of-way or by increasing the height of the conductor above ground, or doing both. For substations, placing major electrical equipment, such as switch-racks and power transformers, near the center of the substation can minimize the magnetic fields outside of the property line as well.

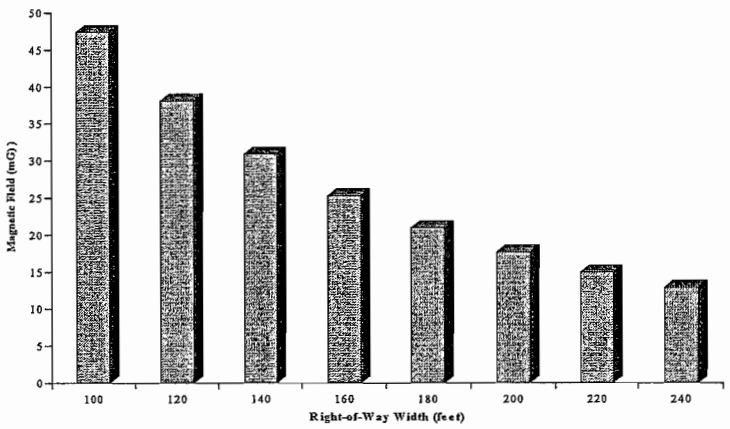
Right-of-Way Width

The minimum width of most overhead right-of-way for power lines of 220 kV and below is determined by swing characteristics of the line and minimum clearances as required by CPUC General Order 95. This has resulted in a centerline-to-edge of right-of-way width of 12.5 feet for overhead 66 kV lines, 15 feet for overhead 115 kV, 50 feet for most overhead double-circuit 220 kV lines, and 75 feet for most overhead single-circuit 220 kV lines. Widths may, at times, exceed or be less than these values, depending upon specific local conditions or other considerations.

For overhead 500kV lines, the minimum right-of-way width is generally 100 feet. It was established through radio interference studies conducted in the early 1960's and is about 20 feet greater than would be needed for swing considerations alone. Exceptions to the 100-foot right-of-way width are found in lands under the US Forest Service and Bureau of Land Management (BLM) jurisdictions, due to the lack of development adjacent to the right-of-way.

While consideration can be given to increasing the width of the right-of-way to reduce magnetic fields in adjacent areas, the high cost of this measure usually limits this technique to small portions of a line. Figure 5-1 demonstrates how the field is reduced as one moves away from the line. In this example, which is based on a double-circuit 220 kV line with a 30 foot ground clearance and a load of 500 amps, a 20-foot increase in right-of-way width is required to achieve a 19 percent reduction in the field at the edge of the right-of-way.

Figure 5-1 Magnetic Fields vs. Distance

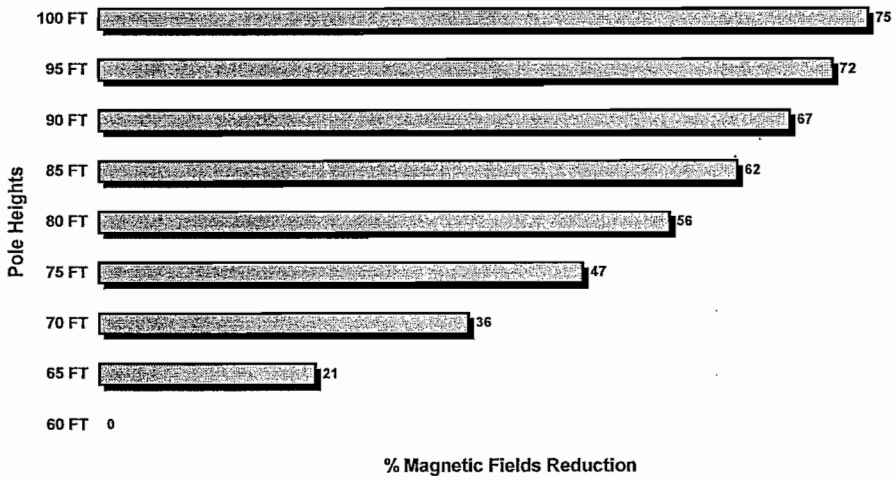


SA 97
5A 65

5.2.2 Raising Conductor Height

Raising the height of the structures, and thus the height of the conductor, can reduce the fields underneath the line, as can be seen in Figure 5-2[11]. For the example shown in Figure 5-2, an increase in pole height from 60 to 65 feet reduces the magnetic field by 21 percent, while an increase from 80 to 85 feet reduces the field by only an additional 6 percent. This approach will be more practical for wood pole lines than for steel tower lines due to the higher costs associated with steel poles.

Figure 5-2 Percentage Magnetic Field Reduction vs. Pole Height



5.2.3 Reducing Conductor (Phase) Spacing

The magnetic field produced by overhead and underground power lines is approximately inversely proportional to the distance between the phase conductors. Thus, reducing the spacing between conductors by 50 percent generally reduces the magnetic field at ground level by approximately 50 percent. In theory, as the distance between conductors approaches zero, the field would approach zero. However, a power line with zero distance between the conductors cannot operate. Thus, the minimum distance between conductors is established by the amount of insulation required to prevent arc over. In addition, in the case of overhead lines, sufficient distance must also be maintained to allow linemen to safely climb the towers for routine maintenance and repairs.

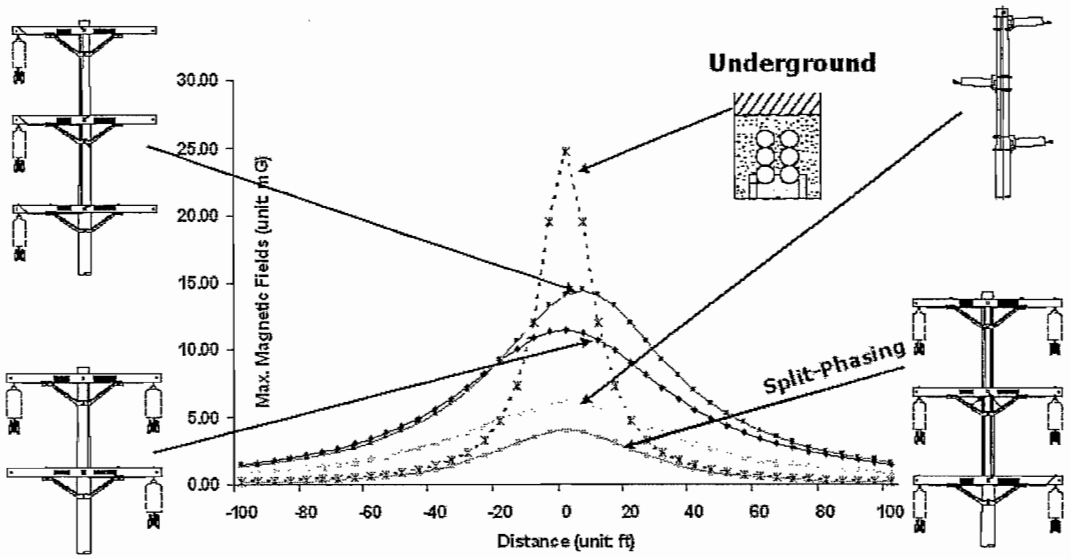
The minimum distance between overhead conductors for power lines built in California is established by CPUC General Order (GO) 95. Utilities may establish minimum clearances greater than those allowed in GO 95 if required for safe working conditions or to prevent flash over. In most cases, insulation levels will be established based on lightning, switching surge, or insulator contamination considerations.

[11] Figure uses a 60 foot pole as the base pole height, single circuit.

Because underground cables are insulated, they may be placed within inches of each other. This results in more cancellation of the magnetic fields between an underground circuit's phases compared with an overhead circuit. Therefore, the fields from an underground circuit will generally be lower than a comparably loaded overhead circuit at most places except directly above the underground line. Directly above the underground line, the cancellation effect of the underground conductors is offset by their proximity to the surface. On the other hand, overhead conductors will be much further away and will generally create a lower field directly under the line.

Figure 5-3 shows differences in magnetic fields produced by four types of pole-head configurations commonly used for 66 kV subtransmission line; see Appendix 14 for various pole-head configurations.

Figure 5-3 Magnetic Fields vs. Pole-head Configuration



5.2.4 Optimizing Phasing in Multi-Circuit Rights-of-Way

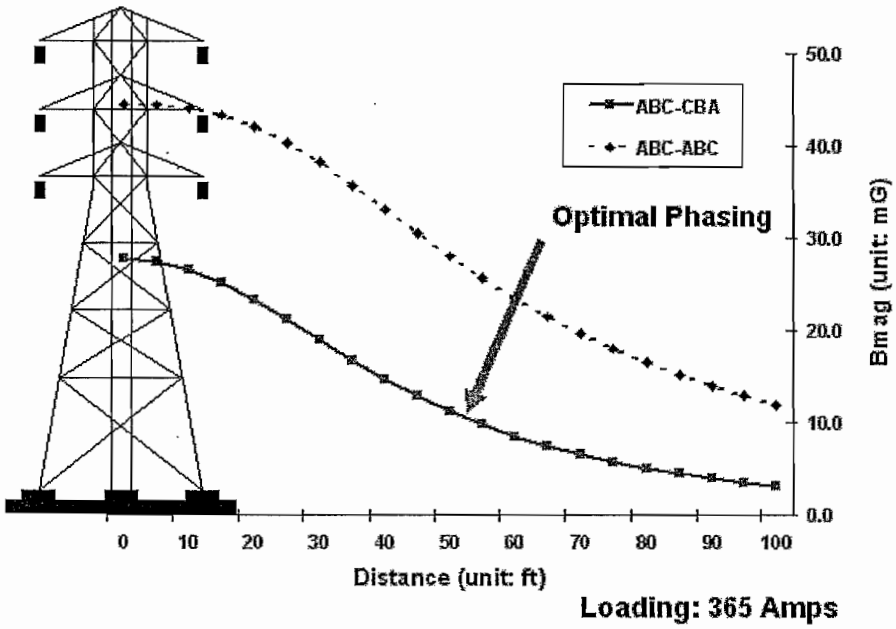
When two or more circuits share a structure, the resultant magnetic field will be the vector sum of the individual conductor fields on the structure. By using proper phasing techniques, the field from one circuit can reduce the field from another circuit, thereby minimizing the level of magnetic field at ground level. Many of SCE's transmission right-of-ways include circuits of different voltages. Often the phasing of circuits 50 kV and above within a single corridor can be coordinated to reduce magnetic field.

Figure 5-4 shows an example of double-circuit 220 kV transmission lines. Optimal "ABC-CBA" phasing provides a 60 percent reduction relative to the ABC-ABC phasing.

5A 99

5A 67

Figure 5-4 Optimal Phasing of 220 kV Transmission Line



5.2.5 Converting Single Phase Lines to Split Phase Lines

In split phase power lines, currents in the three phases are split among six conductors, two per phase. The simplest case consists of splitting the current equally between two parallel circuits using double-circuit cross-arms. Physically, the line looks like a conventional double-circuit subtransmission line where each circuit carries 50 percent of the current. By optimal phasing, magnetic field reductions of 50 percent or more can be achieved. Figure 5-3 shows the magnetic field under a 66 kV power line using a conventional TO 306 pole-head and a split phase design using a double-circuit TO 335 configuration. In this case, a reduction of almost 60 percent was achieved. This technique, however, is usually not a "low-cost" magnetic field reduction measure due to the higher construction costs.

5.2.6 Placing Facilities Underground

All techniques previously discussed for overhead field reduction also apply to underground circuits. The magnetic field from underground circuits will decrease more rapidly as one moves away from the circuit than it will with comparably loaded overhead circuits. This is due to the closer spacing of the underground conductors (refer to Figure 5-3). However, the magnetic field directly above the underground line section can be higher than under the equivalent overhead line section due to closer proximity to the underground conductor (e.g. 66 kV underground cables are located 3 to 4 feet below the ground level whereas overhead conductors are located 40 feet above the ground). In addition, changing facilities overhead to underground are usually not a "low-cost" magnetic field reduction measure due to the higher costs associated with undergrounding of facilities.

5.3 Process of Selecting and Implementing "No- and Low-Cost" Magnetic Field Reduction Measures

Design and construction of electric power systems must comply with all applicable federal, state, and local regulations, safety codes, and SCE standards. Additional EMF mitigation options based on CPUC Decision 93-11-013 must be consistent with these requirements. We utilize a four-stage process to select and implement "no-cost and low-cost" magnetic field reduction measures. The measures are implemented in the following order:

1. "No-Cost" option(s) that can be uniformly applied to the entire project. "Phasing" will almost always be a selected option.

2. Existing public schools, or those under development (if known) should be the next priority for mitigation after "No-Cost". Measures should be applied equitably along the project route if multiple schools are involved. It is possible that all the "low-cost' funds available to the project (i.e., below 4% of the sum of the cost of all project elements) will be expended upon measures near schools--leaving little or no funds available for other "low cost" measures in other areas.

3. Residential, Public Parks, Commercial, and Industrial developments should be considered for "low-cost" mitigation techniques only if the "low-cost" measures can be applied equitably to ensure fairness.

4. Land that is not expected to be developed need not have any "low cost" measures applied.

   For example:

   a. State Parks.

   b. U.S. Forest Service.

   c. U.S. Bureau of Land Management.

   d. Formally designated "open space".

SA 101 5A 69

9 Magnetic Field Management for Distribution Projects

Magnetic field reduction measures have been incorporated into Southern California Edison's "Distribution Design Standards Manual" (DDS) and will be implemented in new construction or major reconstruction of SCE's distribution circuits. Therefore, a Field Management Plan (FMP) is not required for any distribution project less than 50 kV.

9.1 Recommended Magnetic Field Reduction Measures for Distribution

This section offers a description of "no-cost and low-cost" practices and procedures designed to reduce magnetic field exposures from various distribution equipment and facilities. The magnetic fields practices and procedures are categorized into the following sections:

1. Electric Meters and Panels
2. Low-Voltage Services
   a. Overhead Residential
   b. Overhead Commercial/Industrial
   c. Underground Residential
   d. Underground Commercial/Industrial
3. Low-Voltage Secondaries
   a. Overhead
   b. Open-Wire Close to Buildings
   c. Open-Wire Above Pedestrian Walkways
   d. Underground
4. Padmount and Buried Underground Residential Distribution (BURD) Equipment
   a. Padmount Transformers
   b. BURD Transformers
   c. Switches and Capacitor Banks
5. Primary Conductors
   a. Overhead Distribution Circuits with Transmission Overbuilds
   b. Single Overhead Circuits
   c. Double Overhead Circuits
   d. Single Underground Circuits
   e. Multiple Underground Circuits

9.1.1 Electric Meters and Panels

Table 9-1 shows magnetic field levels measured with the EMDEX meter at distances of one and three feet from residential and commercial/industrial meter panels. High current values of 100A for residential and 250A for Commercial/Industrial customers were chosen as typical "worst case" peak demands at the panel.

SA 102

5A 10

Table 9-1 Magnetic Fields and Meters & Panels

Service Type	Measured Magnetic Fields		% Reductions
	Parameters	Bmax (unit: mG)	
Residential	@ 100A, 1 ft. @ 100A, 3 ft.	96 12	87
Commercial/Industrial	@ 250A, 1 ft. @ 250A, 3 ft.	128 15	88

Based on the magnetic fields findings shown in Table 9-1, the following design recommendations for residential and Commercial/Industrial meter panels will be used:

- When practical, locate meters, panels, and service wires near storage rooms or normally unoccupied spaces (such as garages);
- Consider the access needs for FSR/Meter Reader, from a safety, servicing, and reliability perspective.

9.1.2 Low-Voltage Services

9.1.2.1 Overhead Residential Services

The following design recommendations will be used for overhead residential services:

Table 9-2 Design Recommendations for Overhead Residential Services

Design Category	Design Recommendations
New Construction	Use only triplex services.
Rewire	• Replace residential open-wire services with triplex services in accordance with the ongoing open-wire replacement program. • Replace all open-wire services with triplex services for customers completing rewire.

By replacing residential open-wire services with triplex services, a reduction of 75 percent in magnetic field levels at three feet can be achieved at "low-cost."

9.1.2.2 Overhead Commercial/Industrial Services

The following design recommendations for overhead commercial/industrial services will be used:

SA 103

SA 71

Table 9-3 Design Recommendations for Overhead Commercial/Industrial Services

Design Category	Design Recommendations
New Construction	• Use only multiplex services. • Whenever practical, avoid "high use" areas.
Rewire	• Replace Commercial/Industrial open-wire services with multiplex services for customers completing rewire.

By replacing commercial/industrial open-wire services with multiplex services, a reduction of 60 percent in milliGauss levels at three feet can be achieved. Additional magnetic fields level reduction can be achieved by locating the multiplex services further away from occupied areas or structures (e.g., move from 3 to 5 feet).

9.1.2.3 Underground Residential Services

Magnetic field levels over underground service are expected to be very low; thus, it is recommended that no changes to be made.

9.1.2.4 Underground Commercial/Industrial Services

Where practical, parallel service cables and conduits (to the buildings) should be routed away normally occupied rooms.

9.1.3 Low-Voltage Secondaries

9.1.3.1 Overhead Secondaries

Multiplex secondaries are recommended for new overhead secondary installations. When rebuilding or rewiring an overhead secondary, change open-wire secondaries to multiplex conductors when existing open wire is not sufficient to meet capacity and voltage-drop standards.

9.1.3.2 Open-Wire Secondaries Close to Buildings

GO 95 allows a minimum three foot horizontal clearance between the overhead secondaries and the building structures. When rebuilding or upgrading open wire overhead secondaries located close to occupied rooms in buildings, the following "no-cost and low-cost" options may be used to reduce magnetic fields:

- Reduce the pin-spacing of the open-wire conductors to a minimum.
- Increase the conductor clearance of the open-wire secondaries with respect to the building.
- Replace open-wire secondaries with multiplex conductors.

SA 104

5/12

Figure 9-1 Proximity to Building - Magnetic Fields

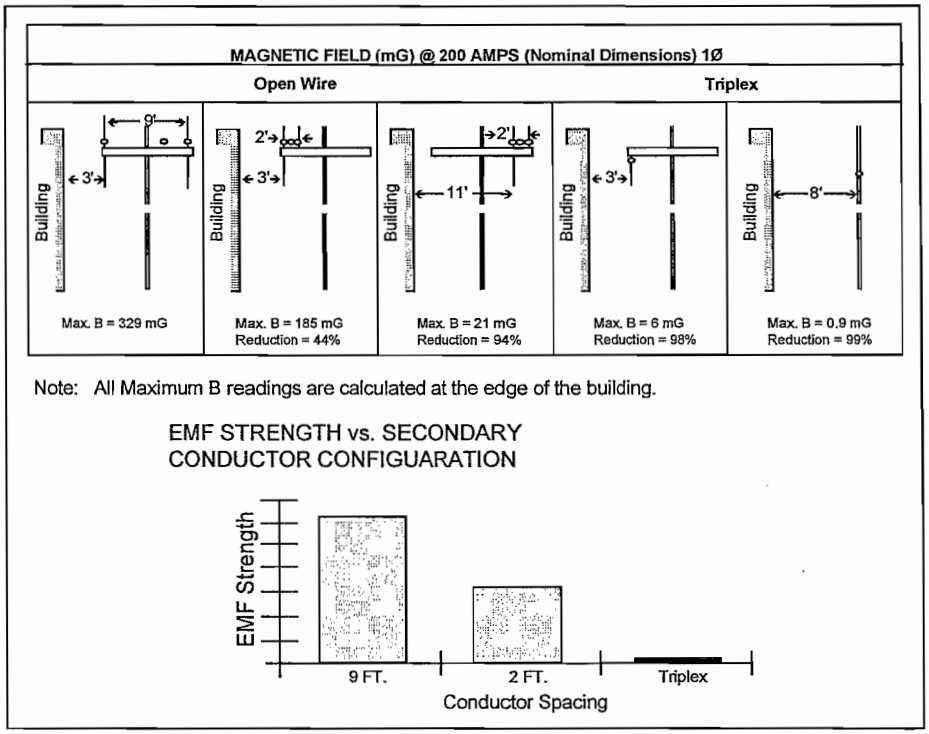


Figure 9-1 shows, for example, how the open-wire secondaries can be arranged on the ten foot cross-arms to reduce magnetic fields. It also shows how open-wire secondaries can be converted to triplex. Depending on the location of the triplex, either at the close end of the cross-arm or on the pole itself, the magnetic field levels are reduced accordingly.

9.1.3.3 Open-Wire Secondaries Above Pedestrian Walkways

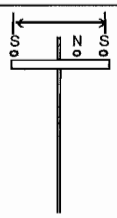
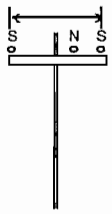
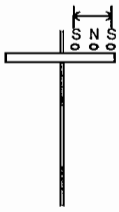
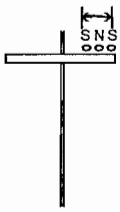
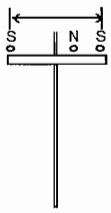
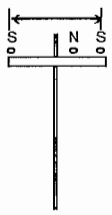
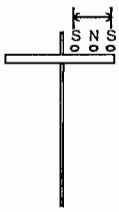
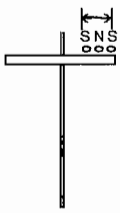
Figure 9-2 shows the magnetic field levels calculated for 20 feet and 25 feet ground clearance and various open-wire secondary configurations. These calculated values show that installing the open wires closer together or using taller poles will reduce the magnetic field levels.

5A 105

5A 13

Figure 9-2 Magnetic Field - Distance from Secondary Wires

MAGNETIC FIELD (mG) @ 200 AMPS (Nominal Dimensions) 1Ø

Conductor Height	Open Wire (Nominal Dimensions) 9 ft.	7 ft.	3 ft.	2 ft.	Triplex
20 FT.	 Max. B = 38.6 mG Reduction = N/A	 Max. B = 31.4 mG Reduction = 19%	 Max. B = 15.0 mG Reduction = 61%	 Max. B = 10.0 mG Reduction = 74%	 Max. B = 0.1 mG Reduction = 99%
25 ft.	 Max. B = 23.7 mG Reduction = N/A	 Max. B = 19.1 mG Reduction = 19%	 Max. B = 9.0 mG Reduction = 62%	 Max. B = 6.0 mG Reduction = 75%	 Max. B = 0.1 mG Reduction = 99%

Note: All Maximum B readings are calculated at a three foot elevation.

9.1.3.4 Underground Secondaries

Since the magnetic field levels over underground secondaries are expected to be relatively low, no further reduction techniques are recommended.

9.1.4 Padmount and BURD Equipment

Padmount transformers, switches, and capacitors are common distribution equipment that are installed above ground level and are normally located in open spaces near customers' residences and businesses.

9.1.4.1 Padmount Transformers

Padmount transformers are installed above ground and located in open yards or parking areas, normally exposed to residences and the public. Magnetic field levels adjacent to the secondary side of the transformer are normally the highest. Levels fall rapidly with greater distance from the transformers. Therefore, when installing a new padmount transformer, position the secondary side of the transformer, when practical, so barriers such as landscaping, fencing, or block walls will discourage people from approaching the secondary side of the transformer.

SA 10

SA 4

9.1.4.2 BURD Transformers

Buried Underground Residential Distribution (BURD) transformers are installed below ground level. The magnetic field levels measured at three feet above ground are relatively low. Thus, changes in existing design practices are not recommended.

9.1.4.3 Switches and Capacitor Banks

The magnetic field levels measured around switches and capacitor banks are relatively low. Thus, changes in existing design practices are not recommended.

9.1.5 Primary Conductors

9.1.5.1 Distribution Circuits with Transmission Overbuild

Unlike the transmission or subtransmission lines, distribution line currents are not generally well balanced. When circuits are not well balanced, the magnetic cancellation effect from optimal phasing decreases. In many cases, using taller poles may reduce magnetic fields more than optimal phasing, especially for subtransmission lines with a lateral distribution circuit underbuild. Therefore, consider using taller poles when planning a new or rebuilt overhead distribution circuit with subtransmission overbuild.

9.1.5.2 Single Overhead Circuit

The following guidelines are recommended to reduce magnetic fields for installing single overhead circuits:

- Whenever practical, use horizontal cross-arm design (Construction Standard DC 510.1) for all new single overhead circuit construction. The single cross-arm and the conductors can be positioned higher compared to the vertical design (DC 540); thus, horizontal design reduces magnetic fields levels. Whenever practical, place the neutral wire at the outmost position on the cross-arm so that all phase wires are positioned close together.

- For circuits using 1/0 or smaller conductors, no change in existing practices is recommended.

- For circuits using 336 kcmil or larger conductors, a minimum of 45-foot long poles will be used.

9.1.5.3 Double Overhead Circuits

The following guidelines for double overhead circuits are recommended to reduce magnetic fields and control costs:

5A
107

5A
115

- Whenever practical, use vertical design (Construction Standard DC 540) for new double overhead circuit construction because there is more clearance between the two vertical circuits for operation and maintenance.

- Use minimum 50-foot poles for new constructions. Using taller poles, in many cases, may reduce magnetic fields more than optimal phasing due to current unbalance.

- At getaways, use optimal phasing, ABC/CBA, if practical, to take advantage of field cancellation from currents in adjacent circuits, for new construction and with other significant work.

9.1.5.4 Single Underground Circuit

The magnetic fields directly above the underground circuit can be higher than the magnetic fields directly below an overhead circuit carrying the same currents. The field is stronger because the underground circuit is much closer to ground level than the overhead circuit; however, magnetic fields from underground circuits will drop off more rapidly than comparably loaded overhead circuits due to the closer spacing of the underground cables.

The following guidelines are recommended to reduce magnetic fields for installing a single underground circuit:

- Locate the conduit away from heavy foot traffic or normally occupied area, where practical.

- Install a heavily loaded circuit in the bottom conduit of a duct bank, where practical.

9.1.5.5 Multiple Underground Circuits

Figure 9-3 shows the magnetic field levels calculated at three feet above ground level over two underground primary circuits installed in various conduit positions. Since the underground conductors twist and roll as they are installed in the duct, the phase relationship and field cancellation may vary over a wide range.

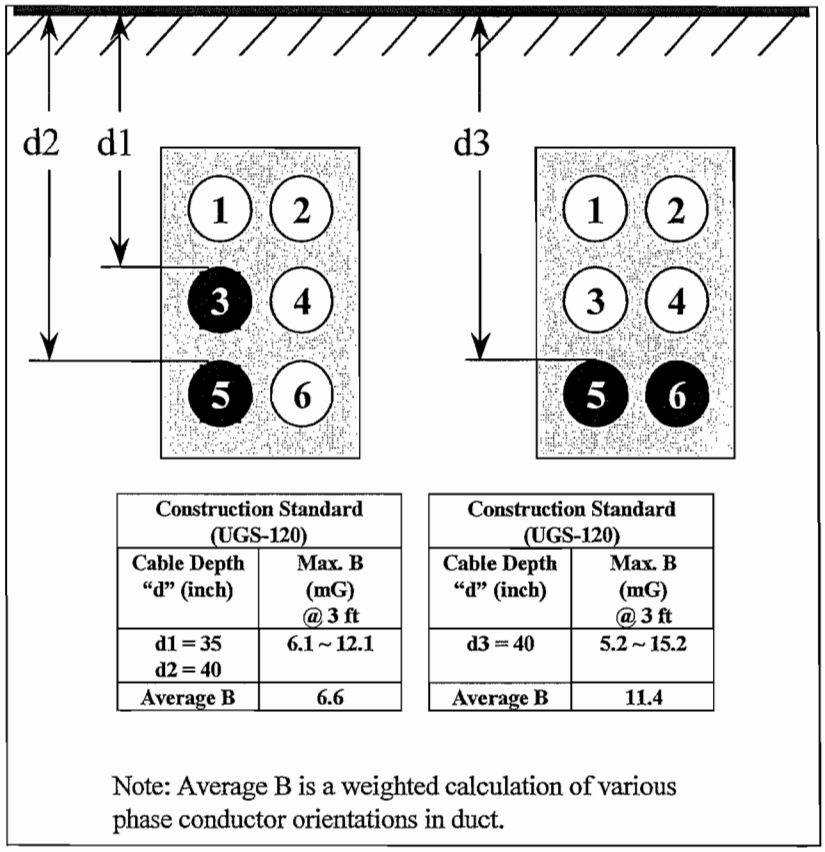
The following guidelines are recommended to reduce magnetic fields for double and multiple underground circuits installed in duct banks:

- Locate the conduits away from heavy foot traffic and normally occupied areas, where practical.

- Install heavily loaded circuits in bottom ducts first, where practical.

5A
1C
5A
16

Figure 9-3 Magnetic Field - Multiple Underground Primary Circuits



Construction Standard (UGS-120)	
Cable Depth "d" (inch)	Max. B (mG) @ 3 ft
d1 = 35 d2 = 40	6.1 ~ 12.1
Average B	6.6

Construction Standard (UGS-120)	
Cable Depth "d" (inch)	Max. B (mG) @ 3 ft
d3 = 40	5.2 ~ 15.2
Average B	11.4

Note: Average B is a weighted calculation of various phase conductor orientations in duct.

SA 109

5A 7/7

Todd Teachout

To: Renee Rech Design
Subject: RE: Answers to your questions about emf radiation for 199 Santa Rosa Avenue.

From: Renee Rech Design [mailto:renee@reneerechdesign.com]
Sent: Thursday, April 29, 2010 4:59 PM
To: Todd Teachout
Subject: Answers to your questions about emf radiation for 199 Santa Rosa Avenue.

Hello Todd.

Please see our answers to your questions below in RED (and Purple Garamond Font imbedded in your questions).

Also, regarding a few items that we noticed in your report:

1. cost of the project – as mentioned to you in our report, the $619,000 project cost is an estimate only that was generated at the start of the new contractor, and we have been working with our contractor diligently to bring those costs down. Additionally, we don't believe that $619,000 is a number that is reflective of 'remodeling project costs' or 'project value', because $150,000+ of those costs were spent toward simply getting our home back to it's original state, from the damages (water and mold) from the previous contractor. Those costs for 'repair and remediation', plus other damages, will soon be part of a lawsuit claim against our previous contractor. So we believe the 'project remodel value' is more accurately represented by the $619,000, less the cost of those damages/repair. Had those damages not occurred, the project cost estimate would not be so high. They do not represent improvements, but only got us back to the value of our home prior to the damages.
2. location of box – per your note to PGE about not knowing if the box was moved from original location: The answer is NO. The location of the current box remains in the same location as the original (westwall of carport), as can be seen by comparing the photo in the the report with the current site condition.

See answers below.
Let us know if you have any questions.

Best,
Matt David/Renee Rech
199 Santa Rosa Avenue

------ Forwarded Message
From: Matt David <matt@onyxworldwide.com>
Date: Thu, 29 Apr 2010 08:57:37 -0700
To: Renee Rech Design <renee@reneerechdesign.com>
Subject: FW:

------ Forwarded Message
From: Todd Teachout <tteachout@ci.sausalito.ca.us>
Date: Thu, 29 Apr 2010 08:51:11 -0700
To: Matt David <matt@onyxworldwide.com>

A few questions, Matt.

Do you use a wireless computer or media network in your home currently? Will you use them at 199 Santa Rosa?

Response: We purposely currently do NOT use a wireless computer in the home and have no wireless planned for 199 Santa Rosa

5A
111

Avenue. We have (and will have) all wiring hardwired through ethernet cable.

Will you have landline telephone service? If so will the landline phone have a wired or wireless handset?

Response: Yes we have landline telephone service. However, we only use landlines hardwired to the wall and corded handsets. We purposely do not have wireless at home, due to EMF.

We do need to mention though that there is a big difference between the (willing) self exposure to use wireless frequencies (850 to 1900 MHz) and the consideration about a person's concern about power frequency magnetic fields (60Hz) that come from services, ground wires, sub-panels and sub-feeds.

RF energies from cellular and cordless phone equipment can be easily controlled in a home environment by switching to OFF, or to airplane mode on cellphones, hardwiring equipment, shielded cabling and moving equipment further away to reduce exposure. We do all of those things. We are very aware of EMF and modify settings, wiring, and behavior accordingly.

HOWEVER, 60Hz EMF exposures from services, ground wires, sub-panels and sub-feeds which are connected to the building are impossible to get away from, once the house is built. This is the type of exposures we would receive from PGE's proposed plan. There is no way to shield or 'turn off' this type of exposure, so there would be constant exposure from the wiring, and boxes, even given all the precautions we have taken up to this point to wire the building for low EMF.

Both the National Institute of Environmental Health Sciences and the California Department of Health Services have published working group reports that support a connection between EMF exposure and childhood leukemia and cancer. EMF's are rated as a class B carcinogen (as are cigarettes) by the EPA.

Is there a EMF radiation level that you are requiring your electricians to install and test to? Does this level have a time component? For instance. Does EMF radiation emitted from walls or outlets have to be less than 2 milligauss for 5 hours?

Response: We are directing our electricians to wire to a maximum EMF exposure of 0.5 milligauss or less in critical areas of the house, bedroom areas especially, throughout the 24 hour period. We expect higher EMF in the kitchen, where we actually spend very little time. We also have paid for the added expense to wire the entire house with Armor cable, instead of typical Romex, to further protect us. Stephen Scott, our EMF consultant, is highly integrated in our project, inspecting work and EMF levels at different stages until completion.

Are all your appliances have emf radiation ratings?

Response: No they do not. No household appliances are available with EMF ratings. We anticipate a higher exposure level from kitchen appliances and we minimize our cumulative exposure by selective usage, modifying how we use them, etc. We have also exercised discretion in product choices, etc. But again, see the answer above regarding the 60Hz EMF. The 60Hz EMF exposures from the services, ground wires, sub-panels and sub-feeds which are connected to the building are impossible to get away from, and those are the ones we are worried the most about. They aren't like an appliance that you can modify use/behavior with.

What is being done (or is being planned to be done) to limit emf from telephone and Cable TV, within the house?

Response: Phone cabling emits no EMFs. CATV cable is shielded and filtered. See answer above for modification of phone use.

I'm attaching a simpler routing for undergrounding. I tried to describe this layout verbally and you indicated that PG&E couldn't do it. I am trying to verify that point.

Response: Aside from the fact that we have no idea how much this will cost to do, from what we see from the sketch, the underground route that you are now proposing does not work for the following reasons:

5A
112

1. PGE said that there was only one acceptable route, one option. That is what was quoted. According to PGE, this route won't work.
2. This still would create a huge health risk. This is because, by keeping the weatherhead and lines running thru the home to the box in the carport, as you are proposing, that creates massive EMF exposures, as they expose the inhabitants to the 60Hz lines now running directly through the home. Your proposal doesn't ease any of those concerns, but in fact still puts the inhabitants at risk. Our EMF consultant and Electrician previously requested moving the weatherhead to a location 10 ft below the home and west, and re-routing that wiring underhouse (but not underground) in order to avoid EMF exposure. (see proposal at end of report)
3. This still would create an overall hardship for the project. As mentioned, we have been through 4.5 years of hardship on this project. This still creates a situation where PGE is involved, trenching is involved, a treacherous hillside, etc. PGE has already mentioned that they cannot do the work within the schedule left on the project. This will put delays on bank loans and refinancing, getting contractors paid off, etc.
4. This still represents a huge expense and drain of resources (both time and money), none of which we have. And would get in the way of finishing the project. This still would require trenching and electrical, a huge expense. This still requires the expense of boring through a tough hillside and huge rocks around the pole...none of which any trench contractors said they could accurately bid until they got further into the work.
5. This still represents issues with tearing into a hillside that is extremely vulnerable (see photos attached of the erosion taking place on our small easement street of 7 houses). We cannot imagine that the city would want to further jeopardize a hillside already experiencing active erosion.
6. Lastly, If the plan you are suggesting is an acceptable option by the city aesthetically, by keeping the service drop overhead, then it seems that you are in agreement that it does no visual harm currently because of the size and configuration of the lot, trees, etc that cover the overhead lines. Nothing can be seen from any neighbors, as is. With all of the tree covering, foliage, etc, the lines are hidden well beneath the trees.

Based on the info submitted the committee can make hardship finding on economic reasons. But the committee is a tough one. I am asking the questions above and submitting the attached sketch as undergrounding this way may be less expensive than the estimates you've provided. A simpler routing may be within the target acceptable cost levels the committee considers in their determination.

...e building permit application you signed in December (or was it November) of 2006 had a notification that if the panel was changed, you could be required to underground. You indicate that the contractor upgraded you panel without your knowledge. Is it reasonable to presume that your contractor notified you that your existing panel was dangerous and it needed to be replaced? Is it also reasonable to characterize the matter of panel load rating as a technical issue that was not specifically discussed? You indicated that the panel was changed without your knowledge. It is more precise to describe the matter that the decision to increase the load rating of the new panel was solely the contractors?

Response: At the time of building permit application, Johnathan Cuhna from Fusion Building pulled the permit on our behalf, as we were in the process of bidding the job and we thought he was going to be our contractor. After bids came in, and Canyon Construction was selected instead, the permit was transferred over to Canyon. We do not remember anyone telling us that the box had to be changed, was going to be changed, or that the load was going to be increased. The contractor made these decisions...and according to the electrician who did the work, it was due to safety, broken breakers, corrosion, ungrounded box, etc.

A timely response is requested. Thanks.

Todd Teachout
City Engineer
City of Sausalito
420 Litho Street
Sausalito, CA 94965
(415) 289-4111 (voice)
15) 339-2256 (fax)

SA
13

Action Minutes – Approved
Sausalito Underground Committee Meeting
May 3, 2010

Present:	A.T. Lynne, Charlotte Mastrangelo, Stafford Keegin, Daniel Passini
Absent:	
Council: Liaison	Herb Weiner
Staff:	Todd Teachout
Others:	Matthew David, Renee Rech, Jean-Paul "Dusty" Fisher

1. Meeting Call to Order at 6:45 PM, A.T. Lynne/Roll Call taken

2. Committee Approved Agenda – Keegin Motion to approve, Lynne – Seconded Motion

3. No Public Comment

4. Variance Application – 199 Santa Rosa – The applicant began a remodel project in late 2006. The original contractor replaced the electrical panel and had not reported to the owner that the change would require lateral undergrounding. The owners ran into problems with the original contractor. In the process of trying to resolve contractor problems the home was damaged by weather. The owners eventually terminated the services of the original contractor and hired a new one. The new contractor brought the matter of utility undergrounding the owners attention after being informed by City.

   The applicants disclosed a medical condition of chemical and EMF hyper sensitivity requiring the use of special materials and construction methods to reduce chemical releases and electrical radiation which require extra costs.

   The property owners represented that utility undergrounding is not feasible physically or economically and requested the Committee confirm the applicant's determination of hardship and approve a variance from SMC Section 18.08 provisions.

   Committee members discussed the report. Committee members asked questions of the Applicant, Committee members asked questions of staff. Committee members expressed their positions. A.T. Lynne was not satisfied that the financial or project information in the application was complete or accurate. Lynne indicated that she could approve a continuance to allow the applicant to address her expressed concerns. Committee Member Passini indicated that he could support a variance due to the physical constraints of the site. If the neighborhood ever undergrounds, this home and the several homes sharing a common driveway are likely to share a common power distribution service placed in the private driveway rather than have individual lateral service to the powerlines along the street. Mastrangelo indicated that she could not support the request as she believed the applicants had access to resources to underground now. Keegin

indicated that he was satisfied with the report, per the Undergrounding Committee Guidelines could make findings of hardship based on the information presented. Keegin also expressed concern for the applicants medical condition.

The applicants indicated that they wanted the committee to take action and not continue the matter.

Committee members continued to discuss.

Motion to approve Variance Request – Passini
Seconded – Keegin

Votes – Ayes – Passini, Keegin
Noes – Lynne, Mastrangelo

Motion fails due to tie vote.

5. Committee Policy Discussion Items
Utility Undergrounding Variance Revisions – Discussion Continued to a Special Meeting on May 10th – Consensus Decision of all committee members.

6. Committee Member/Staff Discussion and Reports

Weiner reported that Public Safety Facilities Project is currently under budget He suggested that the success of this project may allow future consideration regarding an infrastructure bond measure to deal with undergrounding utilities and to address aging roads, sewers, storm drains.

Passini reported that the Private Undergrounding District on Santa Rosa between San Carlos and Bulkley was expected to get underway on 5/10/2010.

Mastrangelo reported that S. Evans had authorized a contractor to proceed with utility undergrounding on Third Street from Richardson to North.

7. Adjourn – Motion by Keegin
Second by Lynne/

at 8:45 PM.