

**PRELIMINARY
ENGINEER'S REPORT**

Prepared for the
CITY OF MISSION VIEJO

**Assessment District No. 08-1
Landslide Abatement**

(FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE)

**Under the Provisions of the
Municipal Improvement Act of 1913**

May 2008

Prepared For:
CITY OF MISSION VIEJO
200 Civic Center
Mission Viejo, CA 92691

Prepared By:
PSOMAS
3187 Red Hill Avenue, Ste 250
Costa Mesa, CA 92626

CITY OF MISSION VIEJO

Mayor

Patricia Kelley

Mayor Pro Tem

Frank Ury

City Council Members

Lance R. MacLean

John Paul Ledesma

Gail Reavis

City Manager

Dennis Wilberg

City Attorney

William P. Curley, III

City Clerk

Karen Hamman

City Treasurer

Irwin Bornstein

Director of Public Works – Street Superintendent

Loren Anderson

City Engineer

Richard Schlesinger, P.E.

Professional Services

Psomas – Assessment Engineer

Richards Watson & Gershon – Bond Counsel

Fieldman, Rolapp & Associates – Financial Advisor

M.L. Stern & Co., LLC – Underwriter

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PREAMBLE

Pursuant to the provisions of the “Municipal Improvement Act of 1913,” being Division 12 of the Streets and Highways Code of the State of California (the “Improvement Act”), applicable provisions of Article XIID of the California Constitution, being the “Right to Vote on Taxes Act” (“Proposition 218”), and provisions of Government Code §53750 et seq., being the “Proposition 218 Omnibus Implementation Act” (the aforementioned provisions are hereinafter referred to collectively as “Assessment Law”), and in accordance with the Resolution of Intention, being Resolution No. _____, adopted by the City Council of the City of Mission Viejo, County Of Orange, State of California, in connection with the proceedings for Assessment District No. 08-1 Landslide Abatement (Ferrocarril/Encorvado Lane/Chrisanta Drive) (hereinafter referred to as “District”), Psomas, as Assessment Engineer to the City of Mission Viejo for these proceedings, submits herewith this report for the District as required by California Streets and Highways Code Section and 10204.

PRELIMINARY APPROVAL BY THE CITY COUNCIL OF THE CITY OF MISSION VIEJO, COUNTY OF ORANGE, STATE OF CALIFORNIA, ON THE 18th DAY OF AUGUST, 2008.

Karen Hamman, CITY CLERK
CITY OF MISSION VIEJO
STATE OF CALIFORNIA

FINAL APPROVAL BY THE CITY COUNCIL OF THE CITY OF MISSION VIEJO, COUNTY OF ORANGE, STATE OF CALIFORNIA, ON THE _____ DAY OF _____, 2008.

Karen Hamman, CITY CLERK
CITY OF MISSION VIEJO
STATE OF CALIFORNIA

EXECUTIVE SUMMARY

Project:	Assessment District No. 08-1 Landslide Abatement (Ferrocarril/Encorvada Lane/Chrisanta Drive) Excavation and Stabilization of Slope above Ferrocarriil Street
Number of Parcels Assessed:	15 assessable parcels (Ferrocarril/Encorvada Lane/Chrisanta Drive) (excludes City right-of-way parcel)
Estimated Costs:	<u>Total</u>
Total Estimated Cost of Capital Improvements:	\$2,396,353
Total Estimated Incidental Costs:	\$55,000
Total Estimated Bond Issuance Costs	\$521,647
Total of Assessments	\$2,973,000
Method of Assessment:	City to fund share (assessment) based on value of roadway improvements. Other 15 parcels assessed based on Risk Factor (potential for future landslide).
Range of Assessment: (per assessable parcel)	\$95,197 to \$190,393 (residential parcels only, City's assessment is calculated at \$402,692)
Approximate Range of Annual Assessment Installment: (Based on 9.5% interest and 30-year period plus \$150 annual admin. cost)	\$9,830 to \$19,510 (residential parcels only)
Maximum Bond Interest Rate:	12%
Maximum Years of Repayment:	39 Years

BACKGROUND

The subject property is located in a neighborhood within the City of Mission Viejo ("City"). The residents of the proposed District have expressed interest in forming an assessment district to consider funding the necessary grading and slope stabilization work to restore and stabilize the landsliding hazard that was evidenced by the January 2005 landslide of the slope above Ferrocarri within their neighborhood.

City staff retained Leighton and Associates, Inc. to complete an evaluation of the recommended improvements to restore and stabilize this area. The recommended repair and stabilization measures consist of the installation of soldier piles, tie-backs and grading. The City previously undertook implementation of a portion of these measures, on an emergency basis, utilizing FEMA funding. The remaining portion of these recommended measures is estimated to cost approximately \$2.396 million. The City has retained Psomas to provide assessment engineering services related to the formation of the District.

Leighton and Associates, Inc has prepared a report titled "Stabilization of Ferrocarri Landslide Hazard Area and Repair of Ferrocarri Landslide, Mission Viejo, California" dated October 19, 2006 (hereinafter referred to as the "Leighton October 19, 2006 Report") on file with the City of Mission Viejo, City Engineer and available on the City's website. This report contains the methodology used to determine which parcels are included in the Assessment District and the associated risk factors. Also contained within this report is a Preliminary Remediation Plan (Plate B-1) that can be used as a basis for the final design of the proposed improvements.

A resolution of intention to form this assessment district is scheduled for consideration by the City Council on August 18, 2008, along with their preliminary approval of an Engineer's Report. A public hearing to receive comments on the Preliminary Engineer's Report and to consider approval of the Report is scheduled for the City Council's regular meeting of October 20, 2008.

DISTRICT PROCEEDINGS

This District will be authorized and administered under the provisions of the “Municipal Improvement Act of 1913,” being Division 12 of the Streets and Highways Code of the State of California (the “Improvement Act”), applicable provisions of Article XIID of the California Constitution, being the “Right to Vote on Taxes Act” (“Proposition 218”), and provisions of Government Code §53750 et seq., being the “Proposition 218 Omnibus Implementation Act” (the aforementioned provisions are hereinafter referred to collectively as “Assessment Law”). This Engineer’s Report has been prepared in compliance with Assessment Law.

Upon approval of the Preliminary Engineer’s Report by the City Council and the adoption of a resolution of intention, the Preliminary Engineer’s Report will be filed with the Clerk of the City, and a time and place for a public hearing will be set. The Clerk will give notice of the public hearing and proposed assessments by mailing an official notice to all persons owning real property proposed to be assessed as part of this District. In accordance with Assessment Law, a ballot will be mailed with the official notice. The ballot will make a provision for such owners to indicate support for or opposition to the proposed assessment.

The public hearing will include presentation and consideration of this report and an opportunity for the public to protest the proposed assessment.

This City Council may not impose the assessment if a majority protest exists. A majority protest exists if, upon conclusion of the public hearing, ballots submitted in opposition to the assessment exceed the ballots submitted in favor of the assessment. In tabulating the ballots submitted, the ballots will be weighted according to the proportional financial obligation of the affected property.

Bond Declaration

Notice is hereby given that bonds to represent unpaid assessments and bearing interest not to exceed the current legal maximum rate of 12 percent (12%) per annum, may be issued in the manner and form provided in Part 6, Division 10, of the California Streets and Highways Code (Improvement Bond Act of 1915) and the last installments of such bonds shall mature not-to-exceed thirty-nine (39) years from the 2nd day of September, next succeeding 12 months from the issue date of the bonds.

DISTRICT BOUNDARY

The Boundary Map and Assessment Diagram for Assessment District No. 08-1 are on file with the Street Superintendent in the office of the Department of Public Works of the City of Mission Viejo and by reference are made a part of this report. A reduced copy of the Boundary Map and Assessment Diagram has been included as Exhibit A hereto.

DRAFT

PROJECT DESCRIPTION

The Works of Improvements are described as follows:

- All work necessary or incidental to the prevention, mitigation, abatement or control of the geological hazard related to the slope above Ferrocarril in the City of Mission Viejo and to repair the damages resulting from such geological hazard.

The works consist of, but are not limited to, the following:

- Demolition.
- Grading consisting of excavation, placement of compacted fill and export of excess material.
- Construction of tie-back anchors.
- Construction of shotcrete whaler, shotcrete facing and gunite platform.
- Construction of underground and surface drains.
- Installation of landscaping.

The proposed slope stabilization improvements will not be constructed within public right-of-way, land, or easements owned by the City of Mission Viejo. The City will need to obtain right-of-entry agreements from all property owners within the work zone prior to commencement of construction.

PLANS AND SPECIFICATIONS

Contained within Leighton's October 19, 2006 Report is a Preliminary Remediation Plan (Plate B-1) that can be used as a basis for the final design of the proposed improvements. It is anticipated that the preparation of the final design plans and specifications will commence upon the City Council's approval of the resolution of intention to form this assessment district.

SEPARATION OF SPECIAL BENEFITS

Only special benefits are assessable under Proposition 218, and a local public agency is required to separate the general benefits from the special benefits conferred on a parcel. By their very nature, most every public improvement financed through an assessment district contains an incidental element of public benefit; so the test is whether, with regard to the improvements, there is a peculiar or unique benefit to the property to be assessed. While general enhancement of property value does not constitute special benefit, increased property value can be an indicator of whether special benefit exists to support an assessment.

A local public agency also is required to determine the proportionate special benefit to each parcel in relationship to the entirety of the costs of constructing improvements, and the assessment on a given parcel may not exceed the reasonable cost of this proportionate special benefit. Apportioning special benefit does not require mathematical precision, but must be reasonable and supported by the report of a registered, competent professional engineer.

The theory underpinning the separation of general and special benefits is that the general public should not be required to pay for special benefits for the few, and the general public should not subsidize the few specially benefited.

As further discussed in this report, the proposed works of improvements and all costs associated with this District are special benefits to the parcels identified and shown on the Boundary Map, the Assessment Diagram, and in the Assessment Roll.

COST ESTIMATE

Estimated Capital Improvement Costs

Leighton and Associates, Inc. prepared a preliminary cost estimate in their report dated October 19, 2006 for the required improvements. This cost estimate was revised in April 2008 to reflect recent data regarding estimated current construction and materials costs. An additional 7% inflation factor has been added to account for the escalation of construction and materials costs that are anticipated to occur prior to the start of construction (approximately one year). This cost information is based on the best available data utilizing the preliminary concept plan prepared for the project. It is not possible to develop a more refined cost estimate until final construction plans are prepared. In addition, recent instability in materials costs makes it difficult to predict future anticipated costs. Therefore, while every effort has been made to prepare a conservative estimate, there is no guarantee that the actual bid prices received for the project will be equal to or lower than this estimate. The revised estimate is shown in the table below.

Item	Amount
Cut + Place as Compacted Fill	\$68,400
Cut & Export	\$17,100
Tie-backs	\$607,500
Shotcrete Whaler	\$504,000
Shotcrete Facing	\$45,000
Gunite Platform	\$75,000
Soil Nails	\$7,800
2-ft wide French Drain	\$11,725
3-ft wide Toe Drain	\$4,500
6-inch thick Gunite Strip	\$5,950
Demolish V-Ditch	\$975
Construct New V-Ditch	\$8,000
Jute Mat & Landscaping	\$250,000
Special Concrete Work	\$35,000
General Clean Up	\$18,000
Sub Total (Construction Cost)	\$1,658,950
Contingency (15%)	\$248,843
Oversight & Engineering (20%)	\$331,790
Sub Total (Project Cost)	\$2,239,583
Escalation to Construction (7%)	\$156,771
Total	\$2,396,353

Bond Amounts including Incidental Costs of the Proceedings

BONDS	Total
General Incidental Costs of the Proceedings	
Assessment Engineer	\$25,000
Printing of Bonds, Official Statement, Notices, Ballots and Advertising	10,000
Fiscal Agent	5,000
Financial Advisor	10,000
Subtotal Incidentals	50,000
Contingency - Incidentals (10%)	5,000
Total General Incidental Costs	\$55,000
Bond Issuance Costs	
Bond Counsel	\$35,000
Disclosure Counsel	20,000
Capitalized Interest (4 mos. at 9.5%)	94,145
Bond Discount (3.0% of Bond Issue)	89,190
Bond Reserve Fund (9.5% of Bond Issue)	282,435
Contingency/Rounding - Issuance	877
Total Bond Issuance Costs	\$521,647
TOTAL BOND ISSUE	\$2,973,000

Bond Discount

A bond discount of 3.0% of the total preliminary assessment has been included in the total assessments. A bond discount is a form of fee paid to the underwriter for the purchase and distribution of the bonds to the public. In addition, a fee of \$20,000 is included for Disclosure Counsel in the bond issuance costs for the preparation of an Offering Memorandum or Official Statement.

Bond Reserve Fund

A Bond Reserve Fund of nine and one half percent (9.5%) of the total preliminary assessments has been included in the total assessments. This fund will be held in trust for the benefit of bondowners as a reserve for the payment of principal of, interest, and any premium on, the bonds and used in the event of delinquencies in the payment of assessment installments to the extent of

such delinquent assessment installments. Sums expended to cover delinquent payments will be recovered from the landowners delinquent in payment of their assessments and credited to the Bond Reserve Fund. The funds will be deposited in an interest bearing account. Near the end of the repayment period, the amount then on deposit in said fund will be used to make the final annual payment, if available. The use of this fund for other purposes is limited by Assessment Law to cover assessment prepayments, pro rata.

Capitalized Interest

Capitalized interest represents interest on the bonds from the date of their issuance until assessment payments are received from owners of assessed parcels. The capitalized interest cost is calculated to cover four (4) months of capitalized interest (9.5% interest rate) and equates to 3.2% of the Bond Issue Amount.

Total of Assessments

Description	Total
Total Construction Costs	\$1,658,950
Total Construction Incidentals	737,403
Total Capital Improvement Costs	2,396,353
Total General Incidentals Costs	55,000
Total Bond Issuance Costs	521,647
Total Assessments	\$2,973,000

Annual Administration Costs

Notice is hereby given that the City of Mission Viejo reserves the right to assess an annual administration charge **not-to-exceed** one hundred fifty dollars (\$150) per parcel. The actual amount of the administration charges will be established each year based on the actual costs incurred to administer the bond issue, including, but not limited to, such expenses as the preparation of the annual installment roll to the County Auditor, the payment of the bond trustee's and agent's fees for registration of the bonds, the payment of dissemination agent services and County charges for collection of amounts on the secured property tax bill.

METHOD OF APPORTIONMENT

Background

Assessment Law requires that assessments levied on each property must be based on the estimated proportionate special benefit each property receives from the works of improvements. Assessment Law does not specify the method or formula that should be used to apportion the assessments in special assessment district proceedings. Assessment Law requires that all assessments be supported by a detailed engineer's report prepared by a professional engineer certified by the State of California.

The Engineer's Report must:

- Define the special benefits provided by the Works of Improvements,
- Identify the particular parcels receiving special benefit over and above the benefits conferred on the public at-large and establish the District boundary,
- Propose a method or a system of formulas for estimating the proportionate special benefit each parcel is estimated to receive, and
- Calculate a proposed assessment for each parcel receiving special benefit.

This section of the Engineer's Report defines the special benefit provided by the Works of Improvements and proposes a method or system of formulas to estimate the proportionate special benefit each parcel receives.

The Assessment Engineer will present the conclusions of the engineer's report and makes recommendations at the public hearing on the assessment district. The final authority and action to confirm and levy assessments rests with the City Council after hearing all testimony and evidence presented at the public hearing and the tallying of ballots cast in favor of or in opposition to the assessments.

The District is located in the City of Mission Viejo between Alicia Parkway and La Paz Road approximately three-quarters of a mile northeast of the San Diego Freeway (I-5). The neighborhood is made up of one and two story residential structures.

Definitions

In order to facilitate a better understanding of the methodology, this subsection defines terms used specifically within the context of this engineer's report. If there is any inadvertent conflict between the definitions provided below and definitions of the same term according to Assessment Law, the term as legally defined shall take precedence.

General Benefit – A general benefit is a benefit that is conferred to all real property located in the District in the same manner and to the same extent that it is conferred to the public at-large.

Equal Proportionate Benefit – An equal proportionate benefit is a special benefit that is paid for with assessment district funds where the special benefit is received equally and uniformly by all real property in the assessment district.

Special Benefit – “A particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at-large. General enhancement of property value does not constitute ‘special benefit.’” (Proposition 218 – California Constitution, article XIII D, Section 4).

The following definitions relate to landslide hazards and are excerpted from a letter dated October 19, 2006 from Iraj Poormand, PE, GE, of Leighton and Associates to Richard Schlesinger, PE of the City of Mission Viejo regarding Stabilization of Ferrocarril Landslide Hazard Area and Repair of Ferrocarril Landslide, Mission Viejo, California :

Safety Factor – The safety factor as it relates to slope stability is the ability of a slope to resist failure and is defined as the ratio of the forces that resist a slope failure over the forces that tend to cause failure of the slope. The higher the safety factor the less vulnerable the slope is to failure.

Risk Level – The risk level is generated from the safety factor for the particular slope in question.

Special Benefits

The special benefits provided by the Works of Improvements are:

- The prevention, mitigation, abatement and control of the slope and the repair of the damages caused by the slope, including improvement to the slope to stabilize it and increase its safety factor against future failure and restoration of the slope to the Code required Safety Factor of 1.5.

Apportionment Methodology

The special benefits provided by the Works of Improvements are, as defined above: improvement to the slope to stabilize it and increase its safety factor against future failure and restoration of the slope to the Code required Safety Factor of 1.5. Not all parcels receive these special benefits to the same extent or degree.

This subsection defines a method and formulas for estimation of the proportionate special benefit each parcel receives. The allocation of special benefit to each parcel within the assessment district is, to some degree, subjective. Therefore, this allocation is based on the knowledge, experience, and judgment of the engineer, technical reference reports on this and other slope failures, and by adoption of this report, confirmed by the City Council.

Engineer's Report
 Assessment District No. 08-1
 Landslide Abatement (Ferrocarril/Encorvado Lane/Chrisanta Drive)

The City of Mission Viejo obtains a benefit from the Works of Improvement based on the value of the roadway improvements along Ferrocarril and Encorvado Lane. If the slope were to fail in the future and damage these roadways, the City would be faced with repairing or replacing these street sections including the roadway, curb and gutter and sidewalk. For the purpose of this proceeding, the City's special benefit has been determined to be an amount equal to the replacement costs of these improvements based on today's dollars adjusted to the anticipated start of construction. Therefore, this report assumes and recommends that the City's assessment in this assessment district is based on the replacement costs shown below. This is felt to be a fairly conservative assumption in that it would take a catastrophic slope failure to completely damage all of these roadway improvements to the point requiring total replacement. A breakdown of these costs is shown in the table below.

Description	Unit	Pricing/Unit	Encorvado		Ferrocarril		Total
			Quantity	Subtotal	Quantity	Subtotal	
Clear & Grub	L.S.	\$ 10,000	50%	\$ 5,000	50%	\$ 5,000	\$ 10,000
R/R Sidewalk	S.F.	\$ 10	690	\$ 6,900	3,000	\$ 30,000	\$ 36,900
R/R Curb & Gutter	L.F.	\$ 30	138	\$ 4,140	600	\$ 18,000	\$ 22,140
R/R Asphalt	S.F.	\$ 9	2,904	\$ 26,136	4,800	\$ 43,200	\$ 69,336
Shoring (Enc.)	L.S.	\$ 35,000	1	\$ 35,000	-	\$ -	\$ 35,000
Earthwork	C.Y.	\$ 17	2,900	\$ 49,300	3,300	\$ 56,100	\$ 105,400
Subtotal (Construction Cost)							\$ 278,776
Contingency (15%)							\$ 41,816
Oversight & Engineering (20%)							\$ 55,755
Subtotal (Project Cost)							\$ 376,348
Escalation to Construction Start (7%)							\$ 26,344
Total							\$ 402,692

R/R = remove and replace

The remaining residential parcels within the Assessment District benefit from the Works of Improvement based on the level of protection against future slope failure afforded each particular parcel. In developed areas if stability of slopes is evaluated for new buildings, reconstruction, additions, or redevelopment, the City of Mission Viejo requires a safety factor of 1.5 before a building permit is issued. If a safety factor is close to unity, or 1.0, landslide potential is considered to be intolerably high and the property is considered unsuitable for habitation. But, if the safety factor exceeds 1.2 or 1.3, structures may be occupied depending on the on reliability and strength of the geometric data and if a catastrophic failure is not anticipated. In evaluating the existing safety factors of structures within the proposed assessment district, safety factors of 1.2 and 1.3 are used to generate risk levels (see Leighton's Report dated October 19, 2006).

The following criteria were used to determine which parcels are to be included in the Assessment District and the respective financial contribution:

1. Based on Leighton's Report dated October 19, 2006 (See Figure 1, and pages A-1 to A-4) a parcel is included in the Assessment District if any area of the parcel is within a zone that has a computed safety factor of less than or equal to 1.2 and/or any portion of a habitable structure on a parcel is located within a zone that has a computed safety factor of less than 1.3.
2. Parcels where the respective structures are located entirely within a zone with a safety factor greater than 1.2 are considered less at risk and receive a 50% reduction in the respective risk level and associated financial contribution.

The City's contribution is based on the value of its roadway improvements from the table above. This dollar figure is subtracted from the total assessment amount and then the remaining costs were allocated to the fifteen residential parcels on a pro-rata basis and weighted in accordance with the assigned risk factor determined from by Leighton's Report dated October 19, 2006. The City's contribution is subject to the approval of the City Council and will require a separate City Council action not associated with the approval of this Engineer's Report.

Individual assessments for each of the 15 residential properties plus the City's contribution are shown in Exhibit B.

It should be noted that current Assessment Law provides that general enhancement of property value does not constitute a special benefit and cannot be taken into consideration when calculating the respective financial contributions for parcels proposed to be included in an assessment district. Therefore, the methodology discussed in Leighton's Report dated October 19, 2006 (see Table 1) was not used. Proposed assessments were calculated based on the respective risk levels assigned to each parcel only.

REFERENCES

"Stabilization of Ferrocarri Landslide Hazard Area and Repair of Ferrocarri Landslide, Mission Viejo, California, October 19, 2006" prepared by Iraj Poormand, Leighton and Associates, Inc.,. Relevant excerpts of this report are included as Exhibit D and the entirety of the report is on file in the City Engineer's Office, City of Mission Viejo.

SUMMARY RESULTS

The District Boundary Map and Assessment Diagram (reduced copy) are shown in Exhibit A.


The Assessment Roll is contained in Exhibit B and details the risk factor by parcel and assessment for each parcel.

A Noticing List containing parcel ownership and mailing address information has been prepared and is shown in Exhibit C.

This report has been prepared and respectfully submitted by:

PSOMAS




Michael D. Swan, CE 25727
May 2, 2008

I, Karen Hamman, as CITY CLERK of the CITY OF MISSION VIEJO, COUNTY OF ORANGE, CALIFORNIA, do hereby certify that the Assessments as shown on the Assessment Roll, together with the Assessment Diagram, both of which are incorporated into this report, were filed in my office on the day of , 2008.

Karen Hamman, CITY CLERK
CITY OF MISSION VIEJO

I, Karen Hamman, as CITY CLERK of the CITY OF MISSION VIEJO, COUNTY OF ORANGE, CALIFORNIA, do hereby certify that the foregoing Assessments, together with the Assessment Diagram incorporated into this report, were approved and confirmed by the CITY COUNCIL of said City on the day of , 2008.

Karen Hamman, CITY CLERK
CITY OF MISSION VIEJO

I, Loren Anderson, as STREET SUPERINTENDENT of the CITY OF MISSION VIEJO, COUNTY OF ORANGE, CALIFORNIA, do hereby certify that the foregoing Assessments, together with the Assessment Diagram were recorded in my office on the day of , 2008.

Loren Anderson, DIRECTOR OF PUBLIC WORKS / STREET SUPERINTENDENT
CITY OF MISSION VIEJO

Engineer's Certificate

The undersigned, pursuant to the provisions of the "Municipal Improvement Act of 1913," being Division 12 of the Streets and Highways Code of the State of California (the "Improvement Act"), applicable provisions of Article XIII D of the California Constitution, being the "Right to Vote on Taxes Act" ("Proposition 218"), and provisions of Government Code §53750 et seq., being the "Proposition 218 Omnibus Implementation Act" (the aforementioned provisions are hereinafter referred to collectively as "Assessment Law"), does hereby submit the following:

1. Pursuant to the provisions of Assessment Law and the Resolution of Intention, I have assessed the costs and expenses of the Works of Improvements to be performed in the Assessment District upon the parcels of land in the Assessment District benefited thereby in direct proportion and relation to the estimated special benefits to be received by each of said parcels. For particulars as to the identification of said parcels, reference is made to the Assessment Diagram and Boundary Map on file with the Street Superintendent in the Public Works Department of the City of Mission Viejo. A reduced copy of the Boundary Map and Assessment Diagram are included in the Engineer's Report as Exhibit A.
2. The Assessment Diagram included in this report shows the Assessment District, as well as the boundaries and dimensions of the respective parcels and subdivisions of land within the Assessment District as the same existed at the time of the passage of the Resolution of Intention, each of which subdivisions of land or parcels or lots, respectively, have been given a separate number upon the Assessment Diagram (Exhibit A) and in the Assessment Roll (Exhibit B).
3. By virtue of the authority contained in said Assessment Law, and by further direction and order of the legislative body, I hereby make the following assessments to cover the costs and expenses of the Works of Improvement for the Assessment District based on the costs and expenses as set forth in the Engineer's Report.

For particulars as to the individual assessments and their descriptions, reference is made to the Assessment Roll (Exhibit B) attached hereto.

PSOMAS



A handwritten signature in black ink that reads "Michael D. Swan".

Michael D. Swan, CE 25727
May 2, 2008

Exhibit A
Boundary Map & Assessment Diagram

DRAFT

**PROPOSED BOUNDARIES OF
ASSESSMENT DISTRICT NO. 08-1
LANDSLIDE ABATEMENT
(FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE)
CITY OF MISSION VIEJO
COUNTY OF ORANGE
STATE OF CALIFORNIA**

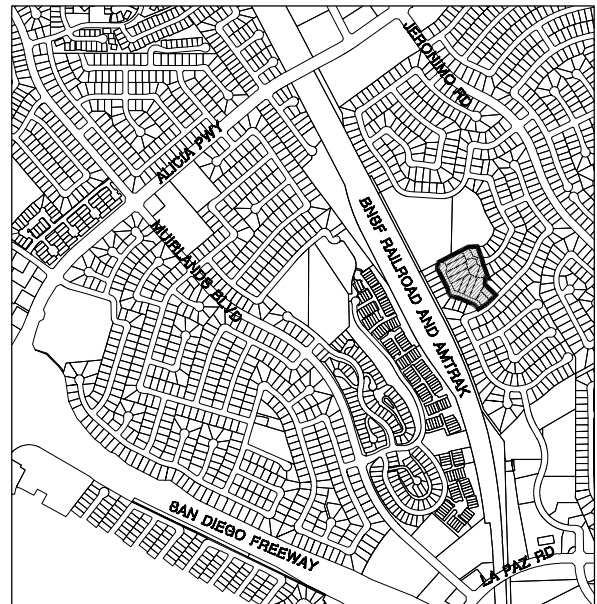
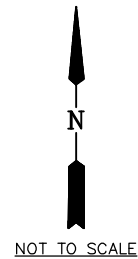
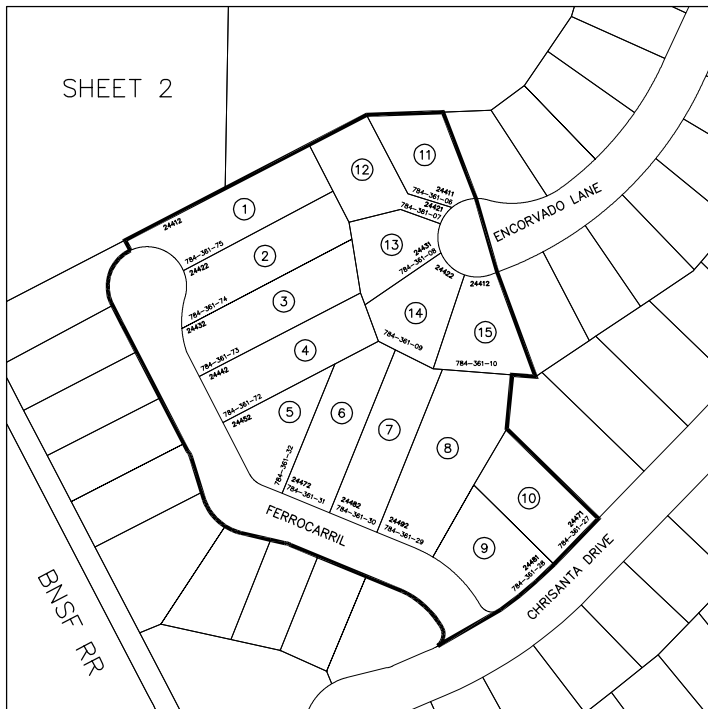
ACCEPTED AND FILED
AT THE
REQUEST OF THE
CITY OF MISSION VIEJO

FILED THIS _____ DAY OF _____, 2007,
AT THE HOUR OF _____ O'CLOCK _____,
IN BOOK _____ PAGE _____ OF MAPS OF
ASSESSMENT AND COMMUNITY
FACILITIES DISTRICTS IN THE OFFICE OF
THE COUNTY RECORDER OF THE COUNTY
OF ORANGE, STATE OF CALIFORNIA.

TOM DALY
COUNTY CLERK/RECORDER

DEPUTY _____

SHEET LOCATION MAP



**MISSION
VIEJO**

VICINITY MAP

LEGEND

— DISTRICT
BOUNDARY

— ROADWAY

FILED IN THE OFFICE OF THE CITY CLERK OF THE CITY MISSION VIEJO THIS _____
DAY OF _____, 2008.

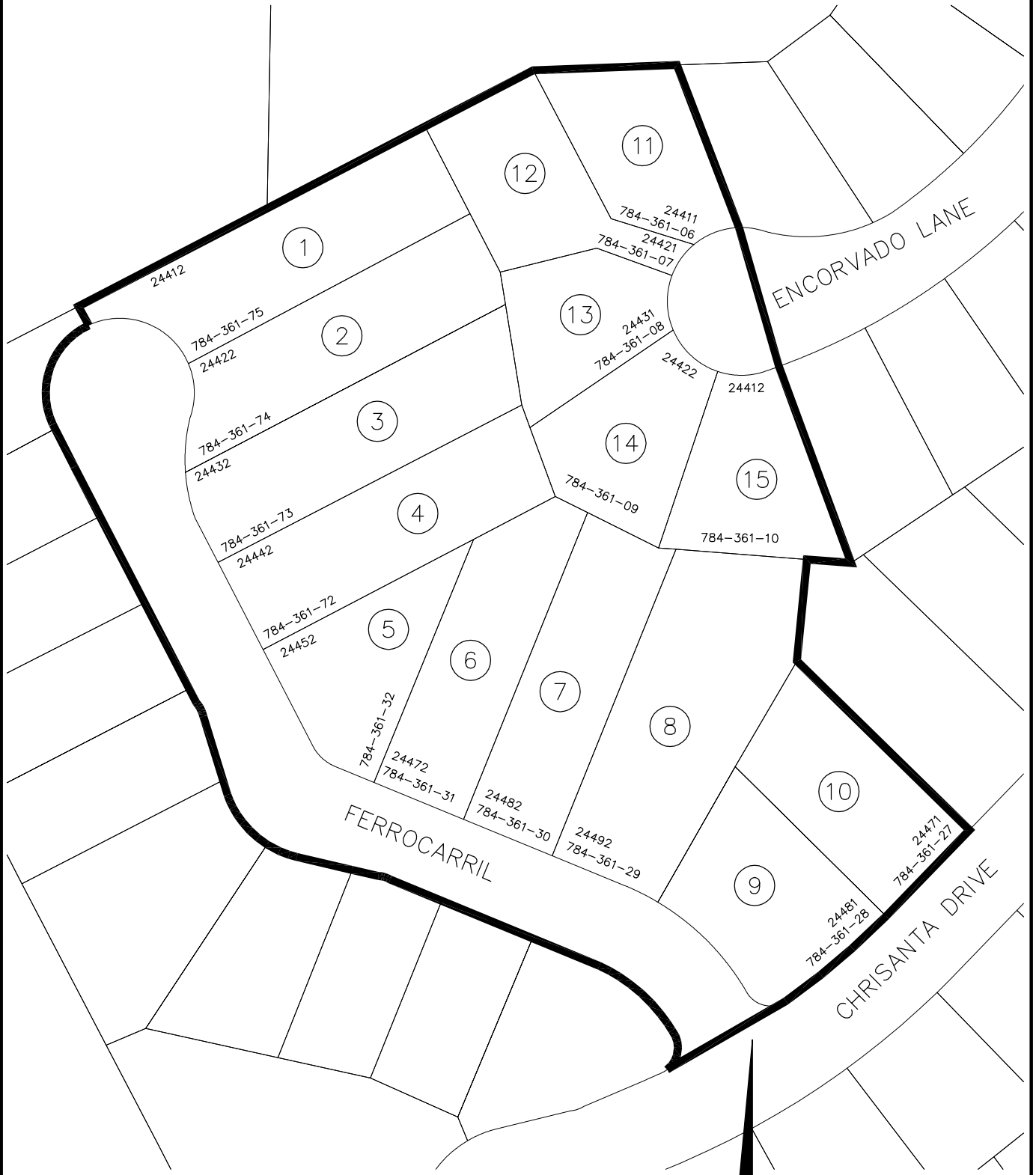
KAREN HAMMAN, CITY CLERK
CITY OF MISSION VIEJO

I HEREBY CERTIFY THAT THE WITHIN MAP SHOWING THE PROPOSED BOUNDARY OF LANDSLIDE
ABATEMENT ASSESSMENT DISTRICT NO. 08-1 (FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE),
CITY OF MISSION VIEJO, COUNTY OF ORANGE, STATE OF CALIFORNIA, WAS APPROVED BY THE CITY
COUNCIL OF THE CITY OF MISSION VIEJO AT A REGULAR MEETING THEREOF, HELD ON THE _____
DAY OF _____, 2008, BY ITS RESOLUTION NO. _____.

KAREN HAMMAN, CITY CLERK
CITY OF MISSION VIEJO

NOTE:
FOR DETAILED DESCRIPTIONS OF LINES AND DIMENSIONS OF PARCELS REFERENCE IS MADE
TO THE MAPS OF THE ORANGE COUNTY ASSESSOR. SAID MAPS SHALL GOVERN FOR ALL
DETAILS CONCERNING LINES AND DIMENSIONS OF SUCH PARCELS.

LANDSLIDE ABATEMENT ASSESSMENT DISTRICT NO. 08-1 (FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE)



LEGEND

STREET ADDRESS	24422	DIAGRAM NO.
ASSESSOR'S PARCEL NO.	784-361-09	

GRAPHIC SCALE: 1"=40'

**ASSESSMENT DIAGRAM
ASSESSMENT DISTRICT NO. 08-1
LANDSLIDE ABATEMENT
(FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE)
CITY OF MISSION VIEJO
COUNTY OF ORANGE
STATE OF CALIFORNIA**

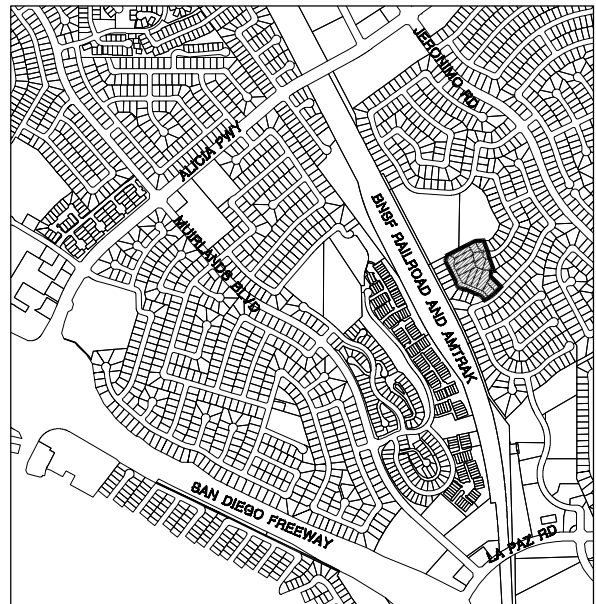
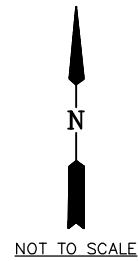
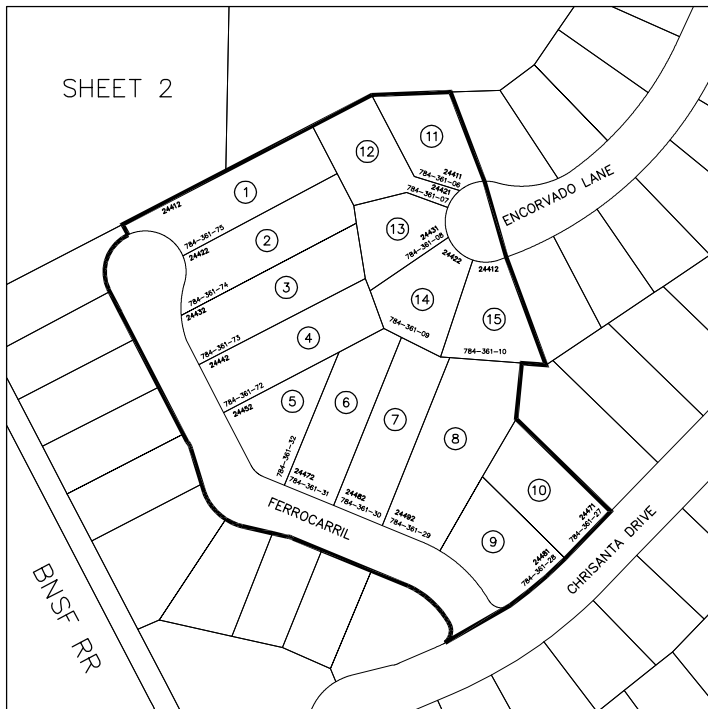
ACCEPTED AND FILED
AT THE
REQUEST OF THE
CITY OF MISSION VIEJO

DATE _____ TIME _____
FEE \$ _____
INSTRUMENT # _____
BOOK _____ PAGE _____
FILED THIS _____ DAY OF _____, 2007,
AT THE HOUR OF _____ O'CLOCK _____
IN BOOK _____ PAGE _____ OF MAPS OF
ASSESSMENT AND COMMUNITY
FACILITIES DISTRICTS IN THE OFFICE OF
THE COUNTY RECORDER OF THE COUNTY
OF ORANGE, STATE OF CALIFORNIA.

TOM DALY
COUNTY CLERK/RECORDER

DEPUTY _____

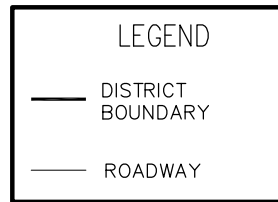
SHEET LOCATION MAP



**MISSION
VIEJO**

VICINITY MAP

AN ASSESSMENT WAS LEVIED BY THE CITY COUNCIL OF THE CITY OF MISSION VIEJO STATE OF CALIFORNIA ON THE PARCELS OF LAND SHOWN IN THIS ASSESSMENT DIAGRAM, SAID ASSESSMENT WAS LEVIED ON THE _____ DAY OF _____, 2008. SAID ASSESSMENT DIAGRAM AND ASSESSMENT ROLL WERE RECORDED IN THE OFFICE OF THE STREET SUPERINTENDENT OF SAID CITY ON THE _____ DAY OF _____, 2008. REFERENCE IS MADE TO THE ASSESSMENT ROLL RECORDED IN THE OFFICE OF THE STREET SUPERINTENDENT FOR THE AMOUNT OF EACH ASSESSMENT LEVIED ON THE PARCELS OF LAND AS SHOWN ON THIS ASSESSMENT DIAGRAM.



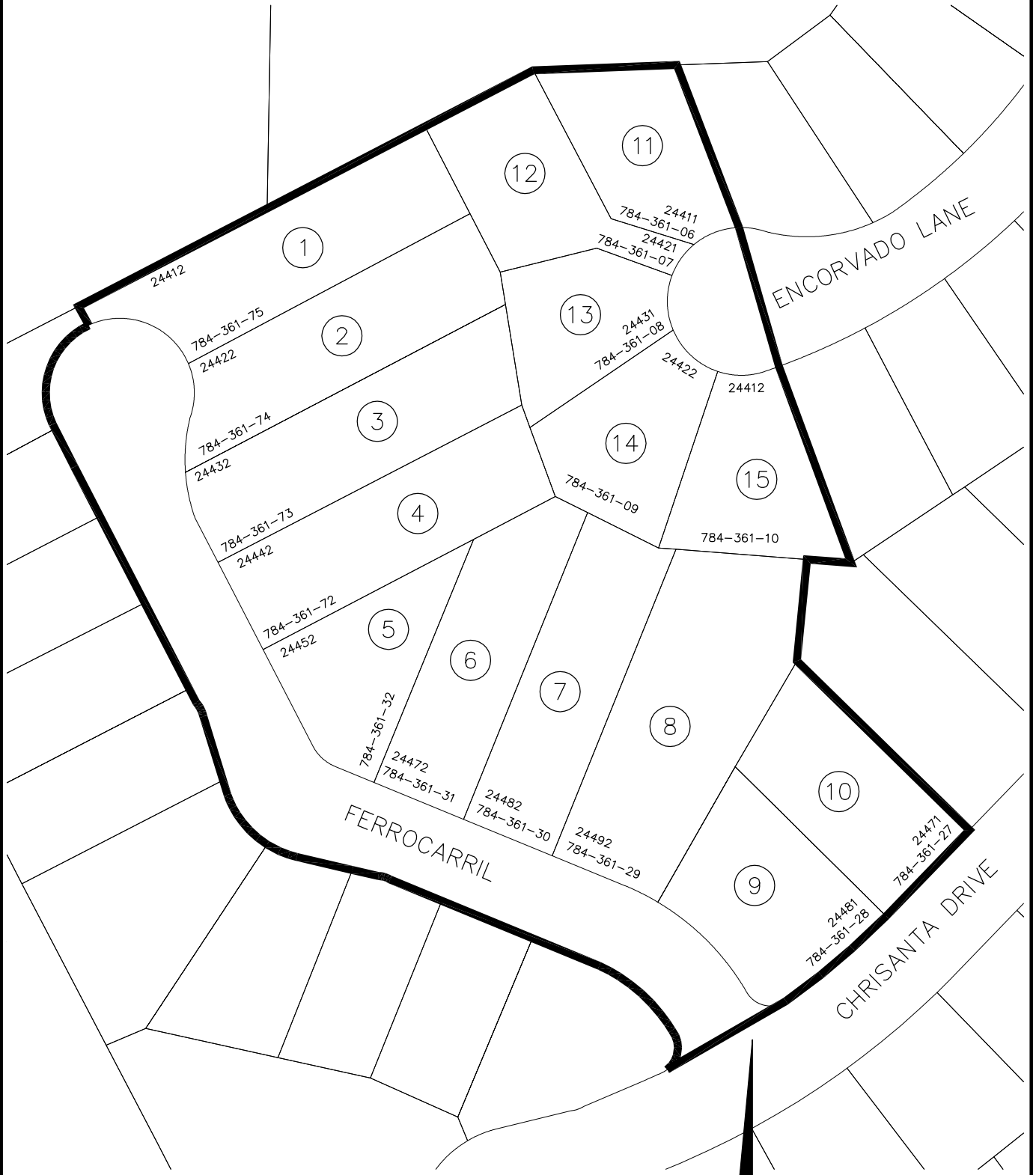
CITY CLERK, CITY OF MISSION VIEJO

RECORDED IN THE OFFICE OF THE STREET SUPERINTENDENT OF THE CITY OF MISSION VIEJO THIS _____ DAY OF _____, 2008.

STREET SUPERINTENDENT, CITY OF MISSION VIEJO

NOTE:
FOR DETAILED DESCRIPTIONS OF LINES AND DIMENSIONS OF PARCELS REFERENCE IS MADE TO THE MAPS OF THE ORANGE COUNTY ASSESSOR. SAID MAPS SHALL GOVERN FOR ALL DETAILS CONCERNING LINES AND DIMENSIONS OF SUCH PARCELS.

LANDSLIDE ABATEMENT ASSESSMENT DISTRICT NO. 08-1 (FERROCARRIL/ENCORVADO LANE/CHRISANTA DRIVE)



LEGEND

STREET ADDRESS	24422	DIAGRAM NO.
ASSESSOR'S PARCEL NO.	784-361-09	

GRAPHIC SCALE: 1"=40'

Exhibit B
Assessment Roll

DRAFT

City of Mission Viejo
 Assessment District No. 08-1
EXHIBIT B
ASSESSMENT ROLL

Diagram Number	Assessor's Parcel Number	Risk Factor	Total Assessment	Property Address	Owner's Name	
					First	Last
1	784-361-75	1.0	\$ 190,393.19	24412 Ferrocarril	Scott & Carolyn	Morgan
2	784-361-74	1.0	\$ 190,393.19	24422 Ferrocarril	Jan & Nancy	Burba
3	784-361-73	1.0	\$ 190,393.19	24432 Ferrocarril	Vasile & Elena	Petean
4	784-361-72	1.0	\$ 190,393.19	24442 Ferrocarril	Genaro & Liliana	Hernandez
5	784-361-32	1.0	\$ 190,393.19	24452 Ferrocarril	David & Nicki	Viggiano
6	784-361-31	1.0	\$ 190,393.19	24472 Ferrocarril	Good Shepherd Communities	
7	784-361-30	1.0	\$ 190,393.19	24482 Ferrocarril	Linda	Rogers
8	784-361-29	1.0	\$ 190,393.19	24492 Ferrocarril	John & Gillian	Devereux
9	784-361-28	0.5	\$ 95,196.59	24481 Chrisanta	Wendell	Slattery
10	784-361-27	0.5	\$ 95,196.59	24471 Chrisanta	Louis & Sue	Lantieri
11	784-361-06	0.5	\$ 95,196.59	24411 Encorvado	Paul	Kinsley
12	784-361-07	1.0	\$ 190,393.19	24421 Encorvado	Greg	Martin
13	784-361-08	1.0	\$ 190,393.19	24431 Encorvado	Bruce	Nosbusch
14	784-361-09	1.0	\$ 190,393.19	24422 Encorvado	Stephen & Susan	Schade
15	784-361-10	1.0	\$ 190,393.19	24412 Encorvado	Charles & Marie	Willey
-	N/A	N/A	\$ 402,692.00	Street Right-of-Way	City of Mission Viejo	
TOTAL			\$ 2,973,000.00			

Exhibit C
Noticing List

DRAFT

City of Mission Viejo
 Assessment District No. 08-1
EXHIBIT C
NOTICING LIST

Diagram Number	Assessor's Parcel Number	Total Assessment	Property Address	Owner's Name		Owner's Mailing Address	
				First	Last		
1	784-361-75	\$ 190,393.19	24412 Ferrocarril	Scott & Carolyn	Morgan	24412 Ferrocarril	Mission Viejo, CA 92691
2	784-361-74	\$ 190,393.19	24422 Ferrocarril	Jan & Nancy	Burba	11211 Bennington Street	Los Alamitos, CA 90720
3	784-361-73	\$ 190,393.19	24432 Ferrocarril	Vasile & Elena	Petean	24432 Ferrocarril	Mission Viejo, CA 92691
4	784-361-72	\$ 190,393.19	24442 Ferrocarril	Genaro & Liliana	Hernandez	24442 Ferrocarril	Mission Viejo, CA 92691
5	784-361-32	\$ 190,393.19	24452 Ferrocarril	David & Nicki	Viggiano	3 Calle Sonoma	Rancho Santa Margarita, CA 92688
6	784-361-31	\$ 190,393.19	24472 Ferrocarril	Good Shepherd Communities		26489 Rancho Parkway South	Lake Forest, CA 92630
7	784-361-30	\$ 190,393.19	24482 Ferrocarril	Linda	Rogers	15 Meadowwood	Rancho Santa Margarita, CA 92688
8	784-361-29	\$ 190,393.19	24492 Ferrocarril	John & Gillian	Devereux	26922 Calle Maria	Capistrano Beach, CA 92624
9	784-361-28	\$ 95,196.59	24481 Chrisanta	Wendell	Slattery	24481 Chrisanta	Mission Viejo, CA 92691
10	784-361-27	\$ 95,196.59	24471 Chrisanta	Louis & Sue	Lantieri	12578 West Miner Trail	Peoria, AZ 85383
11	784-361-06	\$ 95,196.59	24411 Encorvado	Paul	Kinsley	24411 Encorvado	Mission Viejo, CA 92691
12	784-361-07	\$ 190,393.19	24421 Encorvado	Greg	Martin	21682 Kaneohe Lane	Huntington Beach, CA 92646
13	784-361-08	\$ 190,393.19	24431 Encorvado	Bruce	Nosbusch	30100 Town Center Drive	Laguna Niguel, CA 92677
14	784-361-09	\$ 190,393.19	24422 Encorvado	Stephen & Susan	Schade	24422 Encorvado	Mission Viejo, CA 92691
15	784-361-10	\$ 190,393.19	24412 Encorvado	Charles & Marie	Willey	24412 Encorvado	Mission Viejo, CA 92691
-	N/A	\$ 402,692.00	Street Right-of-Way	City of Mission Viejo		200 Civic Center	Mission Viejo, CA 92691

Exhibit D

Report Excerpts:

**“Stabilization of Ferrocarril Landslide Hazard Area and Repair of
Ferrocarril Landslide, Mission Viejo, California, October 19, 2006” Prepared
by Iraj Poormand, Leighton and Associates, Inc.**

DRAFT

STABILIZATION OF FERROCARRIL LANDSLIDE HAZARD AREA
AND REPAIR OF FERROCARRIL LANDSLIDE,
MISSION VIEJO, CALIFORNIA

Prepared for

City of Mission Viejo

200 Civic Center
Mission Viejo, California 92691

Project No. 011492-001

October 19, 2006



Leighton and Associates, Inc.

A LEIGHTON GROUP COMPANY



Leighton and Associates, Inc.
A LEIGHTON GROUP COMPANY

October 19, 2006

Project No. 011492-001

To: City of Mission Viejo
200 Civic Center
Mission Viejo, California 92691

Attention: Mr. Richard Schlesinger

Subject: Stabilization of Ferrocarril Landslide Hazard Area and Repair of Ferrocarril Landslide, Mission Viejo, California

References: Petra Geotechnical, Inc., 2005, Preliminary Geotechnical Investigation of the Ferrocarril Landslide, City of Mission Viejo, California, Job No. 173-05, dated September 30, 2005.

 Petra Geotechnical, Inc., 2005, Summary of Geotechnical Observation and Testing during Temporary Repair of the Ferrocarril Landslide, City of Mission Viejo, California, Job No. 211-05, dated May 31, 2006.

In accordance with your request, this report presents the recommended measures to stabilize the landsliding hazard that was evidenced by the January 2005 landslide at Ferrocarril and remains a threat to the stability of the neighboring properties. The hazard is created by the presence of a weak clay bed that underlies the slope which separates the building pads on Encorvado Lane from the building pads on Ferrocarril and Chrisanta.

Figure 1 depicts the spatial relation of this clay bed to the separating slope, and delineates the areas subjected to unacceptable levels of landsliding risk. The recommended measures will alleviate the landsliding hazard and return safety and value to the affected properties. These recommendations are detailed in Attachment B of this report.

The recommended repair and stabilization measures consisting of soldier piles, tie-backs, and grading are estimated to cost over 3 million dollars. Implementation of a portion of these measures on an emergency basis was undertaken by the City of Mission Viejo utilizing FEMA funding. The implementation of the remaining portion of these measures is estimated to cost approximately 1.82 million dollars (see Attachment B). It is our recommendation that formation of a Geologic Hazard Abatement District (GHAD) is a most viable approach for funding and managing the remaining portions of the stabilization measures.

In a GHAD, the cost of abating the geologic hazard (landsliding in this case) is shared by the properties which benefit from the abatement. The benefit to each property is considered to be proportional to the at risk value of the property. Namely, the greater the value of the property and the greater the risk of the hazard, the larger is the assessment of the remediation cost to the property. The identification of properties at risk, assessment of the property values, and the amount of risk are addressed in a "Plan of Control" (POC) report. The POC is included as Attachment A of this report. This attachment identifies 15 private properties and portions of the public right-of-way (delineated on Figure 1) which are affected by the hazard and will benefit from the abatement. The amount of remediation cost to be assessed to each property and to the City of Mission Viejo as the "owner" of the public right-of-way is shown on Table 1.

GHAD Participant	% Participation	Assessment
24411 Encorvado	3.724	\$67,770
24412 Encorvado	7.611	\$138,525
24421 Encorvado	6.377	\$116,063
24422 Encorvado	7.469	\$135,942
24431 Encorvado	7.069	\$128,653
24412 Ferrocarril	6.672	\$121,436
24422 Ferrocarril	7.246	\$131,876
24432 Ferrocarril	5.912	\$107,601
24442 Ferrocarril	6.493	\$118,176
24452 Ferrocarril	1.446	\$26,318
24472 Ferrocarril	6.925	\$126,033
24482 Ferrocarril	6.493	\$118,176
24492 Ferrocarril	8.298	\$151,015
24471 Chrisanta	3.336	\$60,718
24481 Chrisanta	2.912	\$52,995
City of Mission Viejo	12.017	\$218,703
TOTAL	100.00	\$1,820,000



Leighton appreciates being a participant in this project and looks forward to continued team work which is needed to stabilize the hazard area. If you have any questions, please do not hesitate to contact this office.



Respectfully submitted,

LEIGHTON AND ASSOCIATES, INC.

A handwritten signature in black ink, appearing to read "Iraj Poormand".

Iraj Poormand, PE, GE
Senior Geotechnical Consultant

IP/lr

Attachments: Figure 1

Attachment A – Plan of Control

Plates A1, A2, and A3

Appendix A-1 – Landslide Risk, Ferrocarril Landslide Area

Appendix A-2 – Property Valuations

Attachment B – Landslide Remediation and Abatement of Landslide Hazard

Plate B1

Appendix B-1 – Slope Stability Analysis After Remediation

Appendix B-2 – Tie-Back and Pile Design

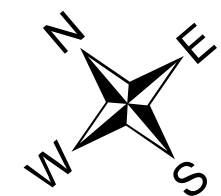
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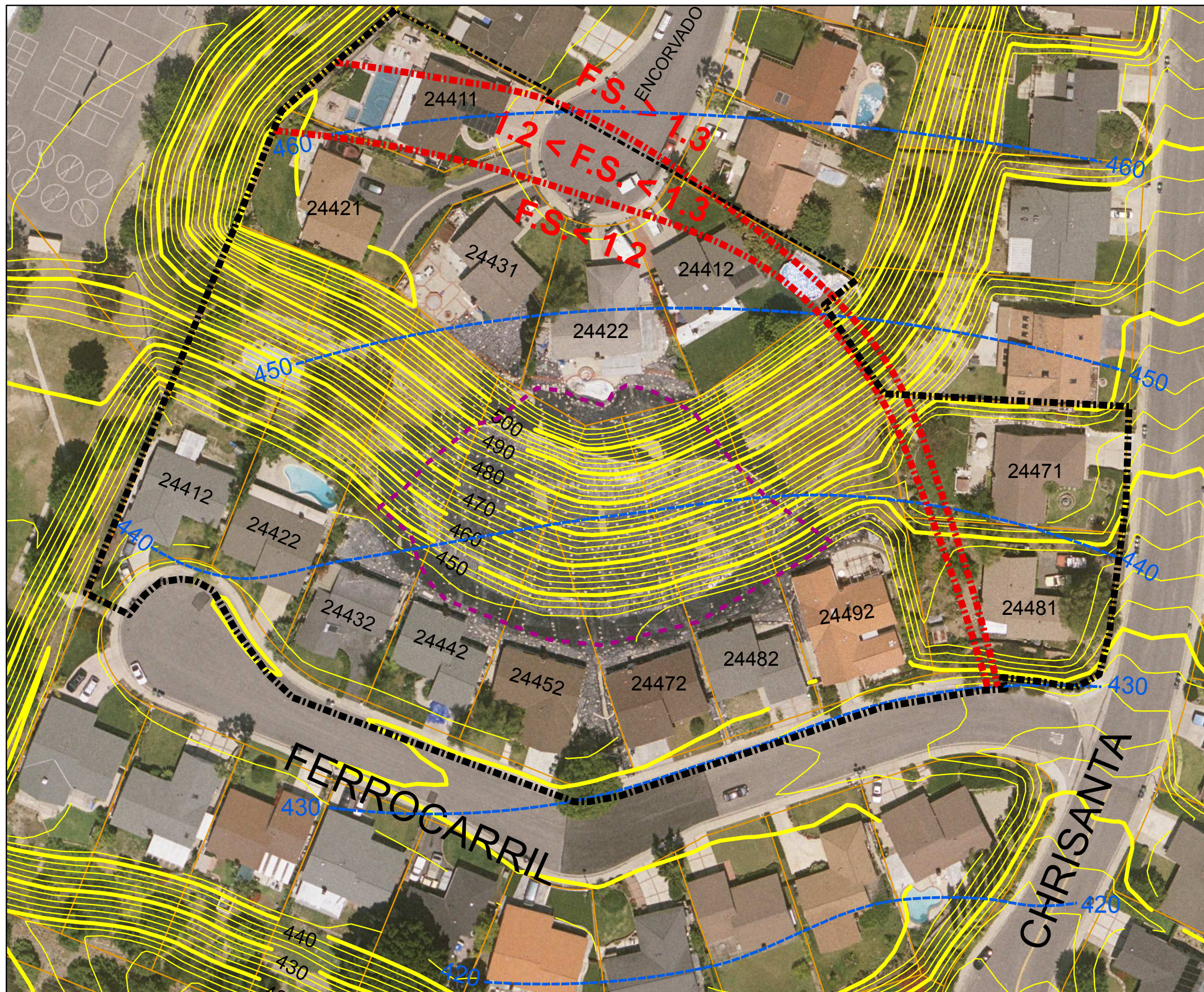
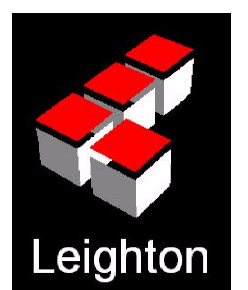
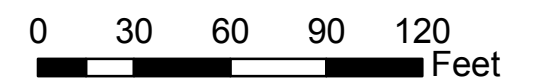
Figure 1

Legend:

- Proposed GHAD Boundary
- Clay Bed Surface Contours
- Factor of Safety Delineation Limits
- January 2005 Landslide Boundary



1 inch = 60 feet



ATTACHMENT A

PLAN OF CONTROL

FERROCARRIL GEOLOGIC HAZARD ABATEMENT DISTRICT

Introduction and Background

The geotechnical investigation of January 2005 Ferrocarril Landslide (Petra, 2005) revealed that a primary cause of landsliding was the presence of a weak clay bed with a slight tilt to the southwest, near the toe of the major slope that separates building pads on Encorvado Lane on the top of the slope from pads on Ferrocarril and Chrisanta at the base of the slope. As a result of the presence of this clay bed which apparently was not discovered during the tract development in the 1960s, the constructed slope lacked an adequate margin of safety and could not endure the rain-caused change in the delicate balance that must have existed between the forces that tend to promote landsliding (slope failure) and those forces that resist landsliding. Considering that the height of the separating slope remains essentially the same and the culprit clay bed extends below the exiting unfailed portions of the slope and that its depth below the back yards of the lower pads diminishes towards the end of Ferrocarril cul-de-sac, one would expect that the stability of the slope remains marginal beyond the limits of the January 2005 landslide. Future changes in groundwater conditions or other factors that influence stability of slopes (such as earthquake loading) may trigger land movement, jeopardizing the safety and integrity of the neighboring properties.

In the accompanying Attachment B of this report we present a number of remedial measures engineered to elevate the safety of the slope to what is normally considered an acceptable level. The cost of implementing these measures is estimated at over 3 million dollars. The City of Mission Viejo, utilizing FEMA funding, has already implemented some of the remedial work. The remaining stabilization efforts are estimated to cost approximately 1.82 million dollars. In this POC, we have first explained how slope stability (or instability risk/landslide hazard) is quantified. Then we have proposed a scale for acceptable risk levels, borderline risk levels, and unacceptable risk levels. We have used this scale to include or exclude properties from the proposed GHAD and to assess the level of landsliding risk to the included properties (see Figure 1 for the delineations and Appendix A1 for details). Using "Zillow.com", a real estate valuation website, the relative value of each of the included properties was then estimated (see Appendix A2). The combination of landslide hazard risk and relative property value was used to proportion the estimated cost of stabilization to the involved properties.

Landslide Hazard Quantifications

Stability of slopes is evaluated by slope stability analysis. This analysis compares the likely forces that tend to cause failure of the slope with those forces that resist such a failure. If these two force categories could be determined with a high level of precision, then as long as the resisting forces exceed the driving forces, there would be no chance for landsliding. With recognition of the inherent variability of soil and bedrock strength and our inability to precisely measure these variables, and considering the complexity of the analytical models, the geotechnical profession as

well as municipal agencies require that the computed resisting forces should exceed the computed driving forces by 50 percent during the design phase. The ratio of the resisting forces to driving forces is called the safety factor or 'Factors of Safety' (FS) and the usual design requirement is a minimum safety factor of 1.5 which implies a negligible risk of deep seated failure (landsliding).

In developed areas if stability of slopes is evaluated for new buildings, most agencies again require a safety factor of 1.5 before a building permit is issued. But, if evaluations are performed for other than new construction purposes such as for feasibility for purchase, there are no preset standards. If the factor of safety is close to unity, landslide potential is considered to be intolerably high and the property is considered unsuitable for residential use. But, if the safety of factor exceeds 1.2 or 1.3, depending on reliability of strength and geometric data, it may be improper to condemn the property.

In evaluating risk of landsliding at the slope which separates the residential pads on Encorvado Lane from those on Ferrocarril, we proposed to use factors of safety of 1.2 and 1.3 as risk level criteria.

We propose that if the computed safety factor is 1.3 or higher, and if no new construction is planned, the landsliding risk would be tolerable and if the factor of safety is less than 1.2, the risk is intolerably high.

The following three cases are distinguished for pads located on the top of the slope (on Encorvado Lane pads). On these "upper" pads, landsliding would result in wasting and loss of all or a portion of the pad.

Case 1: If the computed factor of safety of the entirety of a residential pad exceeds 1.3, the pad does not necessarily need the planned stabilization work, even though there may be incidental benefit to the stability of that pad.

Case 2: If the structure of the residence is underlain by pad areas with less than a safety factor of 1.2, then the property is at a high risk of landsliding hazard, needs stabilization work and should be considered a full participant in the repair cost.

Case 3: If portions of the pad have a safety factor that is less than 1.2, but the entirety of the residential structure is on ground with a safety factor of 1.2 or better, the benefit to the property is substantial but only half as much as the benefit to properties of Case 2. Participation level of these properties would also be half as much as Case 2 participants.

Landsliding impact to the lower pads (pads on Ferrocarril and Chrisanta) is by heave (upward) or lateral movement of all or a portion of the pad and/or by encroachment of slide debris on to the pad. This impact is quantified by evaluating the stability level of the slope above the pad in the direction that impacts the pad.

Case 1: If the slope has a safety factor of no less than 1.3, the risk is considered nominal and participation is not considered mandatory.

Case 2: If the safety factor of the slope in the direction of the residential structure of the pad is less than 1.2, the landslide hazard risk is high and a risk factor of 1.0 is considered proper.

Case 3: If the safety factor is less than 1.3, but the structure is on portions of the pad with a safety factor of 1.2 or more, the hazard level is moderate and a risk factor of 0.5 is appropriate.

Applying the same risk standard to public rights-of-way, we recommend full risk consideration for safety factors of 1.2 or less and 50 percent risk factor for 1.2 to 1.3 range of safety factor.

Based on a specific series of slope stability analyses (Appendix A1) and with consideration of changes in topographic conditions, we have determined the risk zones identified above and presented these zones on Figure 1. The risk factor for our recommended participating properties is as follows:

Private Properties

50% Risk Factor: Properties at: 24411 Encorvado, 24471 and 24481 Chrisanta

100 % Risk Factor 24412, 24421, 24422 and 24431 Encorvado, 24412, 24422, 24432, 24442
24452, 24472, 24482 and 24492 Ferrocarril

Public Right-of-Way

50% Risk Factor A 3,860-sq-ft portion of Encorvado cul-de-sac

100 % Risk Factor A 13-ft-wide, 600-ft-long strip of northwesterly sidewalk and roadway of Ferrocarril as well as a 645-sq-ft portion of Encorvado

Please note that considering the distance between the toe of the slope and edge of Ferrocarril Street right-of-way, assignment of a 100 percent risk factor is considered conservative. The 13-foot width of the instability impact zone, however, is based on engineering judgment considering a worst case scenario.

Valuation of Properties

In addition to level of risk, properties in a GHAD share the cost of remediation proportional to their value. The valuation of the property is done by a real estate appraiser. For this preliminary POC, we have used the internet site "zillow.com" and with modification that are explained in Appendix A-2, computed the following property values:

TABLE A-1		
GHAD Participant	Property Value	Risk Factor
24411 Encorvado	\$672,735	0.5
24412 Encorvado	\$687,552	1.0
24421 Encorvado	\$576,067	1.0
24422 Encorvado	\$679,735	1.0
24431 Encorvado	\$638,554	1.0
24412 Ferrocarril	\$602,735	1.0
24422 Ferrocarril	\$654,552	1.0
24432 Ferrocarril	\$539,067	1.0
24442 Ferrocarril	\$588,554	1.0
24452 Ferrocarril	\$130,629	1.0
24472 Ferrocarril	\$627,552	1.0
24482 Ferrocarril	\$588,554	1.0
24492 Ferrocarril	\$751,545	1.0
24471 Chrisanta	\$602,735	0.5
24481 Chrisanta	\$526,067	0.5
City of Mission Viejo	\$1,287,442*	**
TOTAL	\$10,054,075	

* See Appendix A-2 for details

** Mixed risk factor

ATTACHMENT B
LANDSLIDE REMEDIATION AND
ABATEMENT OF LANDSLIDE HAZARD

The marginal level of stability of the slope that separates the building pads on Encorvado Lane from the pads on Ferrocarril is explained in the Petra 2005 report, and the landslide hazard level is quantified in Appendix A-1 of this report. Pursuant to the January 2005 occurrence of the landslide with geotechnical input from Petra and Leighton, the City of Mission Viejo undertook remedial measures to limit the extent of landslide damage. Initially the failed slope was reshaped by transferring some of the slope mass from the upper portion of the slope to the toe area of the slope. This operation which improved the factor of safety by about 8 percent (see Appendix B-1) slowed the landslide movement enough to allow installation of a series of soldier piles close to the toe area of the slide and improved the factor of safety to 1.25 and allowed conditional reoccupancy of the affected residences. This phase of the project is fully described in the Petra 2006 report. Stability calculations and the resulting improvement in the factor of safety (Cross-Sections AA' and DD') are presented in Appendix B-1 herein. The choice of soldier piles for stabilization was in part to comply with FEMA's guidelines. Leighton's initial consideration of remediation by tie-back anchors was rejected since it apparently would not qualify as "temporary and emergency" type of remediation covered by FEMA funding. Soldier pile design details are presented in Appendix B-2.

While the emergency level stabilization of the landslide has resulted in sufficient improvement in level of safety of the failed portion of the slope to allow conditional occupancy, implementation of further stabilization measures are needed to upgrade the stability level into code compliance and return safety and value to the properties on or near the marginally stable slope. The recommended measures are shown on the attached Remediation Plan (Plate B-1, in pocket). Stability analysis in Appendix B-1 indicates that the post-remediation factors of safety will be code compliant (no less than 1.5)

It is noted that the details portrayed on Plate B-1, while sufficient for safety factor evaluation and for preliminary cost estimates, do not provide enough detail for construction, and Plate B-1 is not a "construction plan". We recommend preparation of construction plans by the project civil engineer based on this report. We also recommend that an additional topographic survey be performed to provide topographic details of the entire proposed assessment area. Limited input was sought and obtained from PB&A Structural Engineers, but the final plans need more structural engineering detailing as well.

The principal remedial element that is designed to elevate the factor of safety is a series of tie-back anchors, each designed with an anchorage capacity of 196 kips. These anchors designed at lengths of between 90 and 120 feet extend from the face of the slope at an inclination of 2:1 into the bedrock below the "clay bed" which underlies the slope. At the face of the unfailed portions of the slope, the anchors are supported by facing reinforced concrete elements (pads) which are approximately 2 feet in thickness and have minimum dimensions of 9 feet by 7 feet. Within the failed portion of the slope (January 2005 landslide) these facing elements are interconnected to

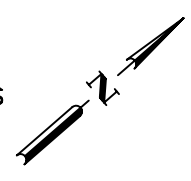
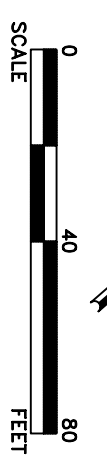
form a "whaler", which in addition to providing face support for the anchors, acts as a near-vertical grade separator allowing the proposed regrading of the previously 1.5:1 (H:V) slope to a 2:1 inclination consistent with the present grading code.

The soldier piles installed on an emergency basis will be interconnected with a grade beam which will also act as a drainage terrace. Most of the other remediation features relate to transitioning the failed area to its adjacent unfailed, but high landslide risk areas, and providing surface and subsurface drainage to the project area as well as providing connection of existing drainage features to the recommended drains.

The cost of implementation of these measures based on the preliminary estimate of quantities shown in Table B-1 is approximately 1.82 million dollars. It is our understanding that the cost of implementing the emergency temporary measures was close to 1.25 million dollars.

TABLE B-1			
Item	Quantity	Rate	Amount
Cut + Place as Compacted Fill	1800 cy	@\$35/cy	\$ 63,000
Cut & Export	950 cy	@\$15/cy	\$ 14,500
Tie-backs	81	@\$5,000 each	\$ 400,000
Shotcrete Whaler	560 cy	@\$860/cy	\$ 481,600
Shotcrete Facing	1,500 sq ft	@\$28	\$ 42,000
Gunite Platform	120 cy	@\$500	\$ 60,000
Soil Nails	12	@\$500	\$ 6,000
2-ft wide French Drain	335 ft	@\$30	\$ 10,050
3-ft wide Toe Drain	75 ft	@\$50	\$ 3,750
6-inch thick Gunite Strip	170 ft	@\$30	\$ 5,100
Demolish V-Ditch	65 ft	@\$10	\$ 650
Construct New V-Ditch	160 ft	@\$40	\$ 6,400
Jute Mat & Landscape	40,000 sq ft	@\$5	\$ 200,000
Special Concrete Work	LS		\$ 30,000
General Clean Up	LS		\$ 15,000
	Total		\$1,343,050
	Contingency (15%)		\$ 201,458
	Oversight & Engineering (20%)		\$ 268,610
	Total		\$1,813,118
	Round-Up		\$1,820,000

ENCORVADO

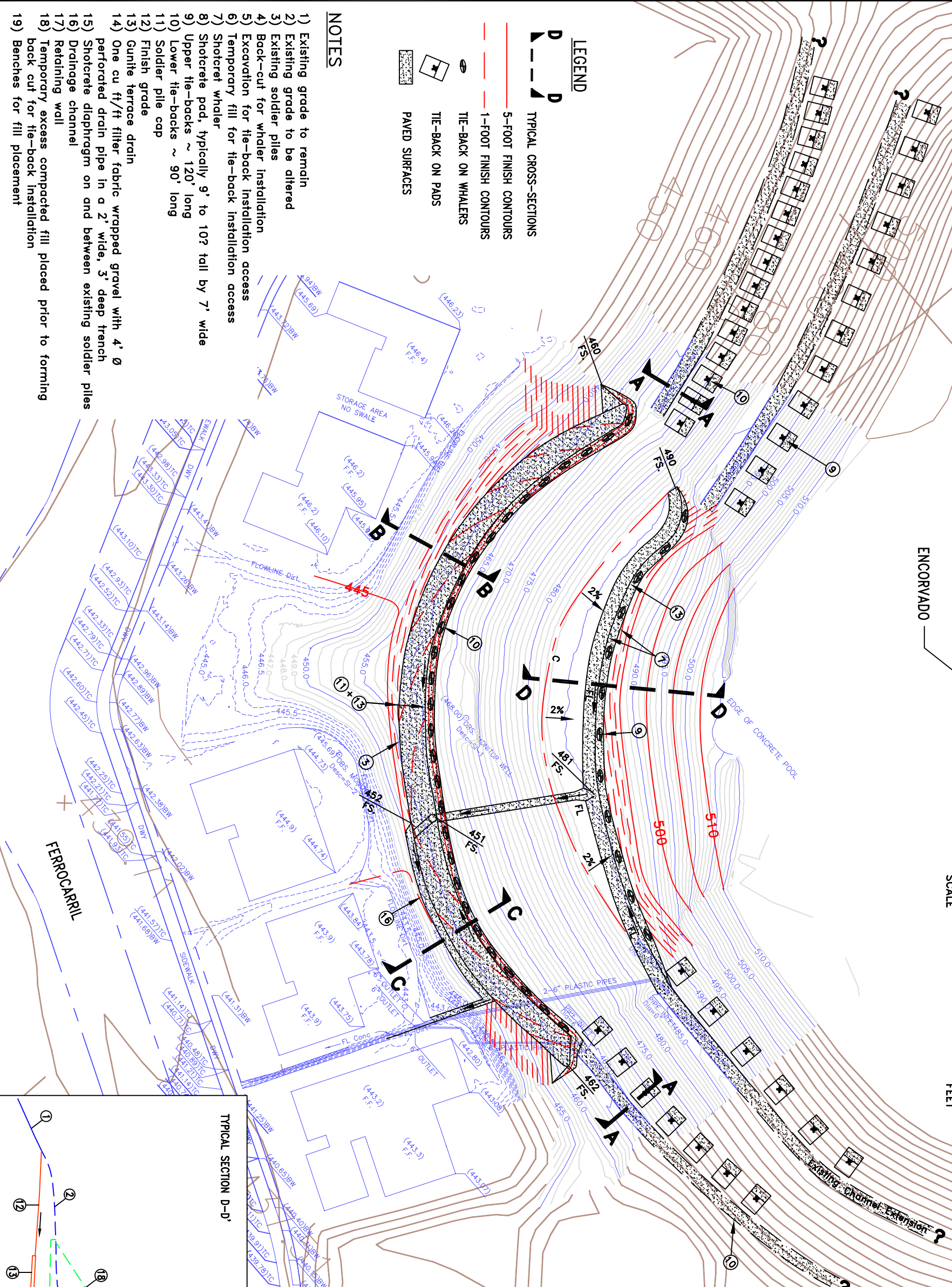


REMEDIATION PLAN
FERROCARRIL LANDSLIDE
 MISSION VIEJO, CALIFORNIA
 (BASE MAP FROM PETRA GEOTECHNICAL, INC.)

Proj: 011492-001 Scale: AS SHOWN Date: 10/06
 Eng/Geol: IP Drafted By: BQT CP By: BQT

REDUCED PLATE B-1

Lightson
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- LEGEND**
- TYPICAL CROSS-SECTIONS
 - 5-FOOT FINISH CONTOURS
 - 1-FOOT FINISH CONTOURS
 - TIE-BACK ON WHALERS
 - TIE-BACK ON PADS
 - PAVED SURFACES

NOTES

- 1) Existing grade to remain
- 2) Existing grade to be altered
- 3) Existing soldier piles
- 4) Back-cut for whaler installation
- 5) Excavation for tie-back installation access
- 6) Temporary fill for tie-back installation access
- 7) Shotcrete whaler
- 8) Shotcrete pad, typically 9' to 10' tall by 7' wide
- 9) Upper tie-backs ~ 120' long
- 10) Lower tie-backs ~ 90' long
- 11) Soldier pile cap
- 12) Finish grade
- 13) Gunite terrace drain
- 14) One cu ft/ft filter fabric wrapped gravel with 4' Ø perforated drain pipe in a 2' wide, 3' deep trench
- 15) Shotcrete diaphragm on and between existing soldier piles
- 16) Drainage channel
- 17) Retaining wall
- 18) Temporary excess compacted fill placed prior to forming back cut for tie-back installation
- 19) Benches for fill placement

