

Attachment D

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Keith Higgins

Traffic Engineer

March 6, 2018

Cody Phillips, Attorney
Anthony Lombardo & Associates
144 W. Gabilan Street
Salinas, CA 93901

Re: Morisoli Interim Access Traffic Analysis, Monterey County, CA

Dear Cody,

Per your request, this is a traffic operations analysis for the proposed interim access for the Morisoli Subdivision on Pine Canyon Road in southern Monterey County, California. The proposed interim access will be provided by the existing Via Canada from Pine Canyon Road to Project Phases A (15 homes) and B (13 homes). Via Canada will only be used for project emergency access when future phases will improve Pettit Road and create a new road between Pettit Road and Phases A and B. Phases A and B will also use Via Canada when Phase C is developed. However, Phase C will not be connected to Via Canada. The implementation of Phase D will result in Phases A and B being disconnected from Via Canada. The sole access for Phases A and B will then be provided by a new road connection to Pettit Road.

Although the ultimate project buildout will take place, it is difficult to predict when it will happen. The analysis and recommendations therefore assume a long-term condition with no credit given for the fact that this will not be a permanent condition.

The following are the traffic-related issues that are addressed in this analysis.

1. The adequacy of Via Canada to serve the proposed 28 homes in the Morisoli subdivision in addition to serving the 20 existing and future homes in the Via Canada de la Paz subdivision plus approximately eight existing homes near Pine Canyon Road. Specific aspects of Via Canada include road width and curvature on the following segments:
 - a. Between Pine Canyon Road and the first curve approximately 360 feet north of Pine Canyon Road.
 - b. The 600-foot segment between the curve 360 feet north of Pine Canyon Road and the existing locked gate on the right fork of the road.
 - c. Between the existing gate and Project Phases A and B.
2. Traffic operations at the existing Pine Canyon Road / Via Canada intersection. This includes the following:
 - a. Level of service, which is referenced from the Morisoli Environmental Impact Report.
 - b. Sight distance to the east and west along Pine Canyon Road.
 - c. Effect on traffic operations associated with the existing residential driveway immediately adjacent to the east side of Via Canada.

- d. Intersection geometrics including channelization and westbound Pine Canyon Road deceleration taper.
- e. Possible signing and striping enhancements.
- f. Roadway lighting.

1. Via Canada Traffic Analysis

Via Canada is a two-lane private road that extends from Pine Canyon Road along the boundary of Project Phases A and B to the Via Canada de la Paz subdivision that is partially built-out. Via Canada has the following three distinct segments. These are shown on **Attachment 1**.

1. (Segment 1 extends about 360 feet from Pine Canyon Road to a 75-foot radius horizontal curve to the left. It currently has a 21-foot pavement width on a 22-foot graded section. It currently serves 21 homes. It will serve a total of 58 homes with the buildout of the Via Canada de la Paz and Morisoli Phases A and B. Assuming a daily trip generation rate of 9.44 daily trip per home as estimated in the "Trip Generation Manual, 10th Edition, 2017, the road will carry about 548 daily trips.
2. Segment 2 extends about 600 feet from the curve to an existing locked gate that is on the right fork in the roadway. It has a pavement width of 12 to 13 feet on an 18 to 20-foot graded section. It will serve a total of 52 homes and carry about 491 vehicles per day.
3. Segment 3 extends to the proposed Morisoli Subdivision Phases A and B. The existing width of this segment is 20 feet. It will serve a total of 48 homes and carry about 453 vehicles per day.
4. All three segments will carry traffic volumes between 450 and 550 vehicles per day, assuming all of the custom lots in Via Canada de la Paz and Morisoli Phases A and B build out before future phases of the Morisoli Subdivision are constructed. The "County of Monterey Standard Details" Standard Street Classifications, included herein as **Attachment 2**, indicates that a Tertiary Street should be provided when it serves over 30 and less than 100 residential lots. The corresponding traffic volume range is 300 to 1,000 vehicles per day. The three segments of Via Canada all will carry volumes within this range. Therefore, a Tertiary Street should be provided on all three segments.
5. Via Canada is a rural private hillside road. Phase A has a lot density of 0.17 lots per acre, which is an average gross lot coverage of 5.88 acres per lot. Phase B has a lot density of 0.08 lots per acres, which is an average gross lot coverage of 12.5 acres per lot. The Monterey County Tertiary Street section for lots over 5 acres should apply. The County standard section is included as **Attachment 3**. The typical cross section includes two 9-foot travel lanes plus one 2-foot paved shoulder and one two-foot graded shoulder. The total pavement width on Via Canada should be a minimum of 20 feet. Segments 1 and 3 already meet this requirement. Segment 2 has an existing pavement width of 12 to 13 feet. Segment 2 does not meet the County standard width and, therefore, needs to be widened to meet the 20-foot requirement.
6. The horizontal alignment of the existing Via Canada consists of several tight curves. The first is at the transition between Segments 1 and 2. The second is in on Segment 3, about 1,400 feet past the locked gate. The third is about 300 feet past the second curve. All have a centerline radius of about 75 feet. These can accommodate fire trucks with adequate space to allow oncoming vehicles to pass. The South Monterey County Fire Protection District has indicated that a 20-foot pavement width is adequate.

2. Pine Canyon Road / Via Canada Intersection Traffic Analysis

The Pine Canyon Road / Via Canada intersection is a T-intersection located about 3,000 feet (slightly less than 0.60 miles) from Jolon Road. It is currently uncontrolled, although traffic entering the intersection on the Via Canada approach, which is the side street, must yield to through traffic on Pine Canyon Road. The following is an analysis of traffic operations at this intersection.

1. Level of Service

The Via Canada approach to Pine Canyon Road will carry about 548 vehicles per day. It will carry about 43 in the morning peak hour with 32 entering Pine Canyon Road and 9 exiting Pine Canyon Road. It will carry about 58 in the evening peak hour with 21 entering Pine Canyon Road and 37 exiting Pine Canyon Road. Pine Canyon Road currently carries about 5,000 vehicles per day, according to "2017 Annual Average Daily Traffic" data published by the Monterey County Public Works Department. Existing morning and evening peak hour turning volumes at this intersection are depicted on **Attachment 4**.

By comparison, Pine Canyon Road is expected to carry about 12,000 vehicles per day at General Plan Buildout, according the Tavernetti Subdivision Draft Environmental Impact Report (DEIR)," Denise Duffy and Associates, Inc., September 11, 2001. The FEIR is dated December 2004. The Tavernetti Subdivision is now named the Morisoli – Amaral Subdivision. That DEIR did not analyze the Pine Canyon Road / Via Canada intersection because at project buildout Via Canada will only be used by the project for emergency access. However, the DEIR did analyze the Pine Canyon Road / Pettit Road intersection. The Pettit Road leg is forecasted in the DEIR to carry 244 morning peak hour trips, with 184 entering Pine Canyon Road and 60 exiting Pine Canyon Road at General Plan Buildout. The forecast for the evening peak hour includes 118 entering Pine Canyon Road and 208 exiting Pine Canyon Road for a total of 326 vehicles on Pettit Road. General Plan Buildout morning and evening peak hour turning volumes at the Pine Canyon Road / Pettit Road intersection are also depicted on Attachment 4.

The Pine Canyon Road / Pettit Road intersection was forecasted to operate at an overall A Level of Service at General Plan Buildout with stop control only on the Pettit Road. The worst movement, the Pettit Road left turn onto northbound Pine Canyon Road, was forecasted to operate at Level of Service C. These levels of service are well within acceptable levels. Pine Canyon Road will carry about 2.4 times as much traffic as it currently carries. Pettit Road will carry about 5.6 times as much traffic as Via Canada.

The Pine Canyon Road / Via Canada intersection, will clearly operate acceptably with only 18% as much traffic on Via Canada on an interim basis. Ultimately the Via Canada volumes will be much lower than the interim condition. No level of service impacts will result at this intersection under its interim condition. .

2. Sight Distance

The Via Canada approach is located on the outside of an 800-foot radius horizontal curve on Pine Canyon Road. The curve has a super-elevation of about 10%. According to the Caltrans Highway Design Manual, this accommodates a comfortable speed of 50 miles per hour. The posted speed limit is 45 miles per hour. However, vehicles can negotiate the curve at 55 miles per hour, based on field observations.

Travel speeds of 55 miles per hour require stopping sight distance of 500 feet. About 510 feet of sight distance is provided to the left for vehicles on the Via Canada approach. Sight distance to the left is adequate. However, an existing oak tree on the inside of the curve approximately 330 feet north of the intersection has the potential of impeding visibility. It is recommended that the tree be trimmed to remove branches within the line of sight.

Sight distance to the right when entering Pine Canyon Road on Via Canada is over 1,000 feet to a crest vertical curve near the Royal Drive intersection. Sight distance looking right from Via Canada is adequate. No sight distance improvements are required.

3. Effect of Adjacent Residential Driveway

As depicted on **Attachment 1**, a residential driveway intersects Pine Canyon Road immediately adjacent to and north of Via Canada. The driveway serves two homes. This has the potential to create some confusion if vehicles enter or exit simultaneously to or from the driveway and Via Canada. It was noted in the field that there is also a driveway serving the two homes that intersects Via Canada about 110 feet from Pine Canyon Road. Both driveways have a gate. The driveway directly accessing Pine Canyon Road should be removed. All traffic to and from the two residences will then have access to and from Via Canada with no direct access to and from Pine Canyon Road. **Attachment 5** illustrates the recommended driveway modifications that should be added as a condition for Project Phases A and B to utilize Via Canada as an interim access.

4. Channelization

As discussed in the Level of Service section above, Via Canada left turns onto Pine Canyon Road will operate at LOS C. There will be very few right turns from Via Canada onto Pine Canyon Road. Separate Via Canada left turn and right turn lanes will not be warranted.

Channelization improvements could also be required to accommodate northbound Pine Canyon Road left turns onto Via Canada. There will be very few northbound Pine Canyon Road left turns. A left turn lane will clearly not be warranted.

A total of about 21 southbound Pine Canyon Road right turns onto Via Canada. According to the worksheet on **Attachment 6**, neither a right turn lane or right turn taper will be warranted with Project Phases A and B. The equivalent of a paved 60-foot right turn taper is provided by the existing adjacent residential driveway. No channelization improvements are required.

5. Traffic Control

The Pine Canyon Road / Via Canada intersection currently is uncontrolled. According to the California Vehicle Code, at “T” intersections without “Stop” or “Yield” signs, drivers must yield to traffic and pedestrians on the through road. However, it is recommended that a stop sign with stop legend and limit line be provided on the Via Canada approach to provide more clearly indicate right of way priority. **Attachment 5** illustrates recommended signing and striping to be incorporated at the Pine Canyon Road / Via Canada intersection for Project Phases A and B.

6. Roadway Lighting

No specific warrants are provided in the current California Manual on Uniform Traffic Control Devices (CMUTCD) for intersection roadway lighting. The American Association of State Highway and Transportation Officials (AASHTO) provides general guidelines, but no numerical warrants. Roadway lighting in rural areas is often not supported by the local community because of the nighttime glare and impact on the rural ambiance. However, it has been demonstrated to have a safety benefit in reducing collisions.

Intersection lighting is not provided at most intersections along Pine Canyon Road, including the Jolon Road intersection. This indicates that roadway lighting is not encouraged in this rural location. The decision to install roadway lighting at this intersection should be made by the Monterey County Public Works Department during the Encroachment Permit process.

3. Recommendations

The following are recommended improvements to be implemented by Morisoli Subdivision Phases A and B.

1. Widen Segment 2 (approximately 600 feet extending from the 75-foot radius curve 360 feet from Pine Canyon Road to the locked gate on the right fork) of Via Canada to a 20-foot pavement width.
2. Trim the branches on the existing oak tree on the inside of the curve on Pine Canyon Road approximately 330 feet north of the Via Canada intersection to reduce the potential to impede sight distance from Via Canada.
3. Implement the following improvements at the Pine Canyon Road / Via Canada intersection. These are illustrated on **Attachment 5**.
 - a. Eliminate the existing residential driveway intersecting Pine Canyon Road immediately adjacent to and north of Via Canada.
 - b. Install a stop sign (R1-1) with stop pavement legend and limit line on the Via Canada approach to Pine Canyon Road.
 - c. Install a Two-Direction Large Arrow Sign (W1-1) directly across Pine Canyon Road from the Via Canada approach lane.
 - d. Install delineators in conformance with Caltrans Manual on Uniform Traffic Control Devices (CAMUTCD) Figure 3F-102 for rural intersections.

Cody Phillips
March 6, 2018

- e. Monterey County Public Works should determine if roadway lighting should be installed at the Pine Canyon Road / Via Canada intersection as a part of the Encroachment Permit that will be required to install the stop sign included as Recommendation 4.

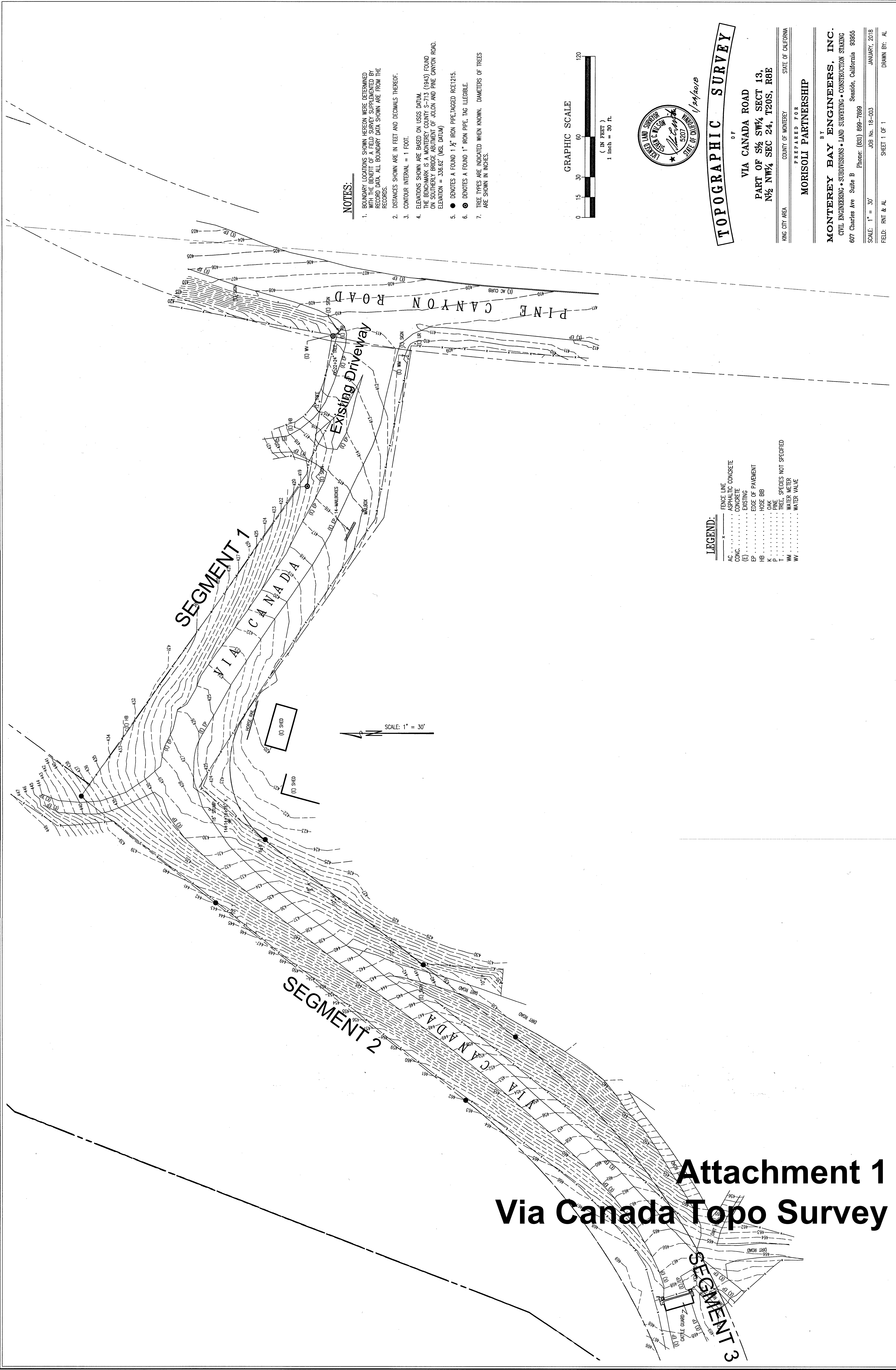
If you have any questions regarding the contents of this proposal or need additional information, please do not hesitate to contact me at your convenience. Thank you for the opportunity to assist you with this project.

Sincerely,

Keith B. Higgins

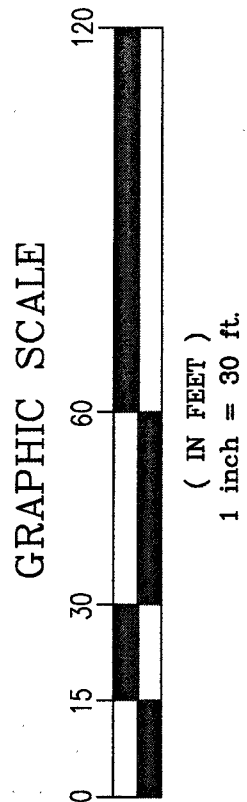
Keith B. Higgins, PE, TE

attachments



NOTES:

1. BOUNDARY LOCATIONS SHOWN HEREON WERE DETERMINED WITH THE BENEFIT OF A FIELD SURVEY SUPPLEMENTED BY RECORD DATA. ALL BOUNDARY DATA SHOWN ARE FROM THE RECORDS.
2. DISTANCES SHOWN ARE IN FEET AND DECIMALS THEREOF.
3. CONTOUR INTERVAL = 1 FOOT.
4. ELEVATIONS SHOWN ARE BASED ON U.S.S. DATUM. THE ELEVATION OF MONTEREY COUNTY 5-713 (1943) FOUND ON SOUTHERN BRIDGE ABUTMENT OF JOLON AND PINE CANYON ROAD. ELEVATION = 336.62 (MSL DATUM).
5. ● DENOTES A FOUND 1 1/2" IRON PIPE, TAG RCE1215.
6. ○ DENOTES A FOUND 1" IRON PIPE, TAG ILLEGIBLE.
7. TREE TYPES ARE INDICATED WHEN KNOWN. DIAMETERS OF TREES ARE SHOWN IN INCHES.



1/24/40/8

TOPOGRAPHIC SURVEY

OF

VIA CANADA ROAD

PART OF S½ SW¼ SEC 13,
N½ NW¼ SEC 24, T20S, R8E

KING CITY AREA
COUNTY OF MONTEREY
STATE OF CALIFORNIA

PREPARED FOR

MORISOLI PARTNERSHIP

BY

MONTEREY BAY ENGINEERS, INC.

CIVIL ENGINEERING • SUBDIVISIONS • LAND SURVEYING • CONSTRUCTION STAKING

607 Charles Ave Suite B Phone: (831) 899-7889 Seaside, California 93955

SCALE: 1" = 30'

JOB No. 18-003

JANUARY, 2018

FIELD: RNT & AL

SHEET 1 OF 1

DRAWN BY: AL

LEGEND:

- AC ASPHALTIC CONCRETE
- CONC CONCRETE
- (E) EXISTING
- EP EDGE OF PAVEMENT
- HB HOSE BB
- K OAK
- P PINE
- T TREE, SPECIES NOT SPECIFIED
- WM WATER METER
- WV WATER VALVE

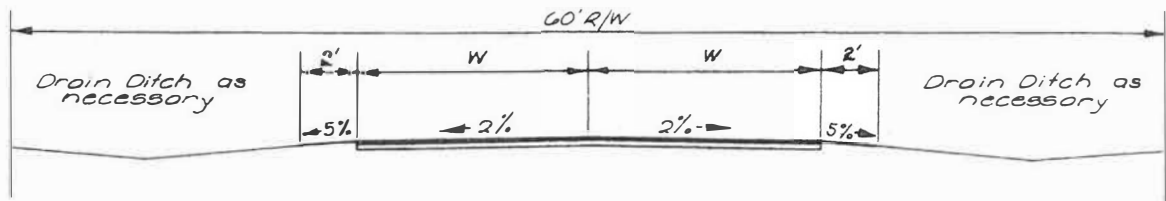
Attachment 1
Via Canada Topo Survey

STANDARD STREET CLASSIFICATIONS

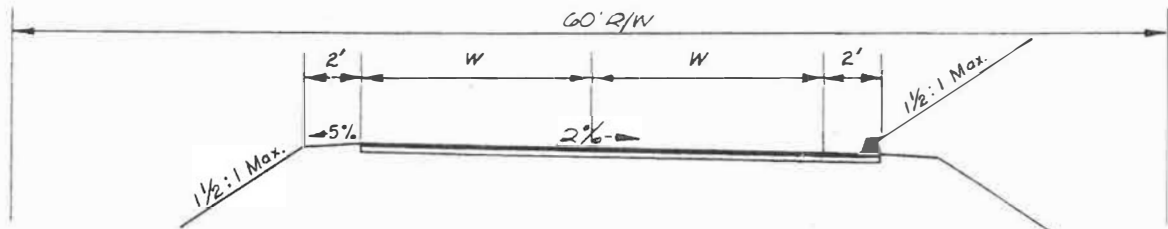
<u>TRAFFIC</u>	<u>STREET TYPE</u>
10,000 vehicles expected in 20 years 1,500 left turning movements per day	Major Divided Street
This street is so designated by a Master Plan, Precise Plan or Road Classification Plan adopted by the Board of Supervisors. 5,000 vehicles or more, but less than 15,000 vehicles expected in 20 years	Major Street
Collect or carry vehicular traffic through a subdivision and that is not expected to serve in the future as a major street. 400 units with two or more entrances or 200 units 800 to 3,000 vehicles expected in 20 years	Secondary Street .
100 units - abutted by residential lots and provide access to not more than 100 units. 300 to 1,000 vehicles expected in 20 years	Tertiary Street
30 units or less - begins and terminates on the same cross street and provides access to not more than 30 abutted units Maximum 300 vehicles expected in 20 years	Loop Street
16 units or less on dead-end street to provide access to a limited number of abutting units and cannot be extended to serve a greater number of dwelling units Maximum 200 vehicles expected in 20 years	Cul-de-sac Street
Special purpose street types	Industrial Street - Half-width Street - Frontage Road - Alley - Split-level

Attachment 2
Monterey County Standard
Street Classifications

Note: The appropriate street classification for Via Canada is Private Tertiary Rural Hillside Road - over 5 Acre Lots, where W=9 Feet.



RURAL ROAD

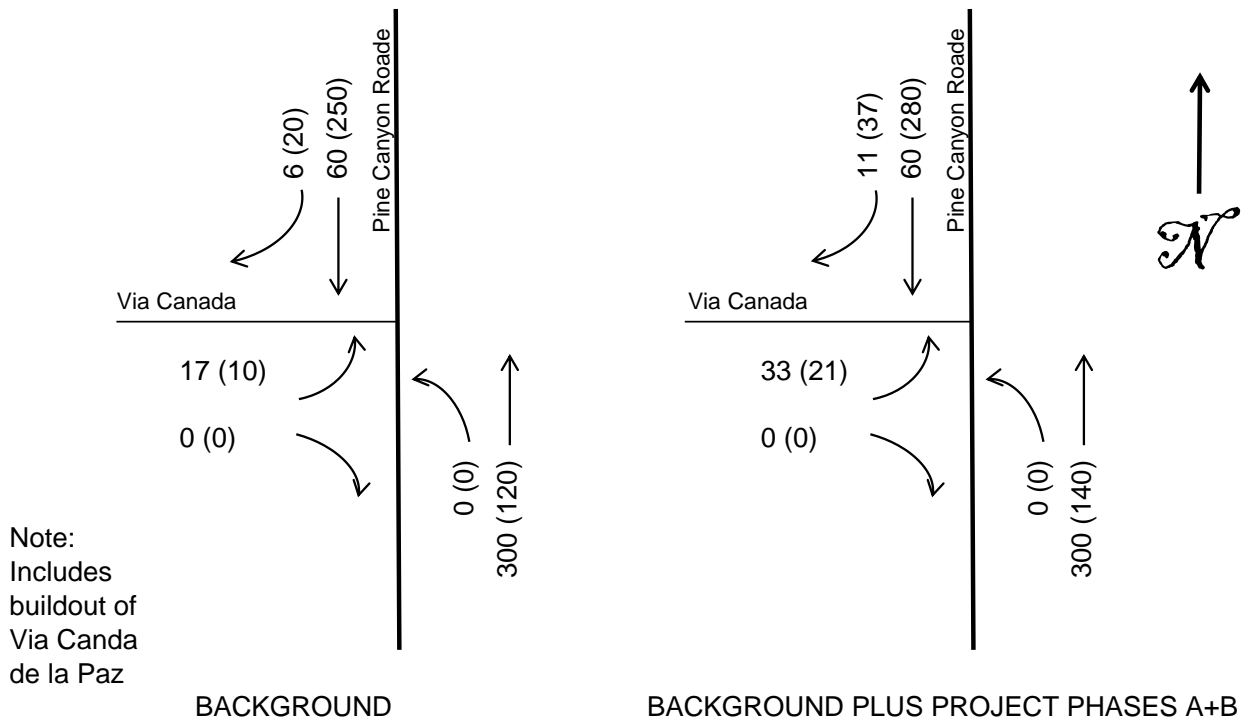


RURAL SIDEHILL ROAD

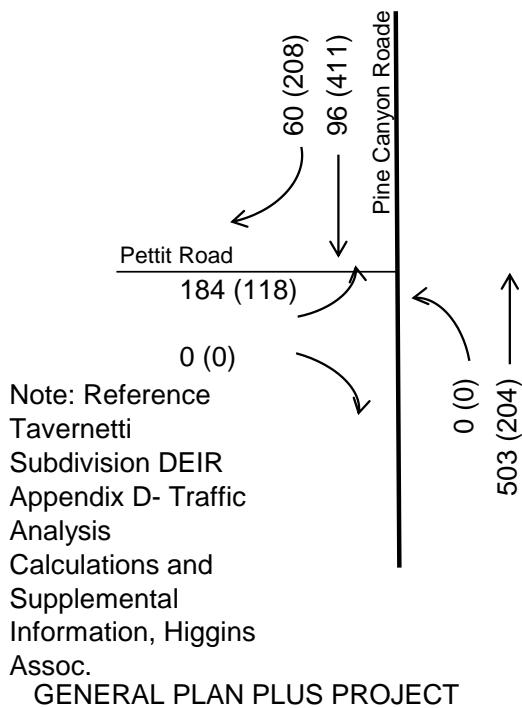
Attachment 3 Private Rural Road Standards

Street Classification	W	
	Under 5ac.	Over 5ac.
Secondary Road	11'	10'
Tertiary Road	10'	9'
Cul-de-sac Road	9'	8'

MONTEREY COUNTY		DEPT. OF PUBLIC WORKS
STANDARD DETAILS		
RURAL ROAD (PRIVATE ONLY)		
APPROVED	<i>Bruce W. McVain</i>	DATE 10-24-77
REVISED	DATE	PLATE NO.
		5



PINE CANYON ROAD / VIA CANADA



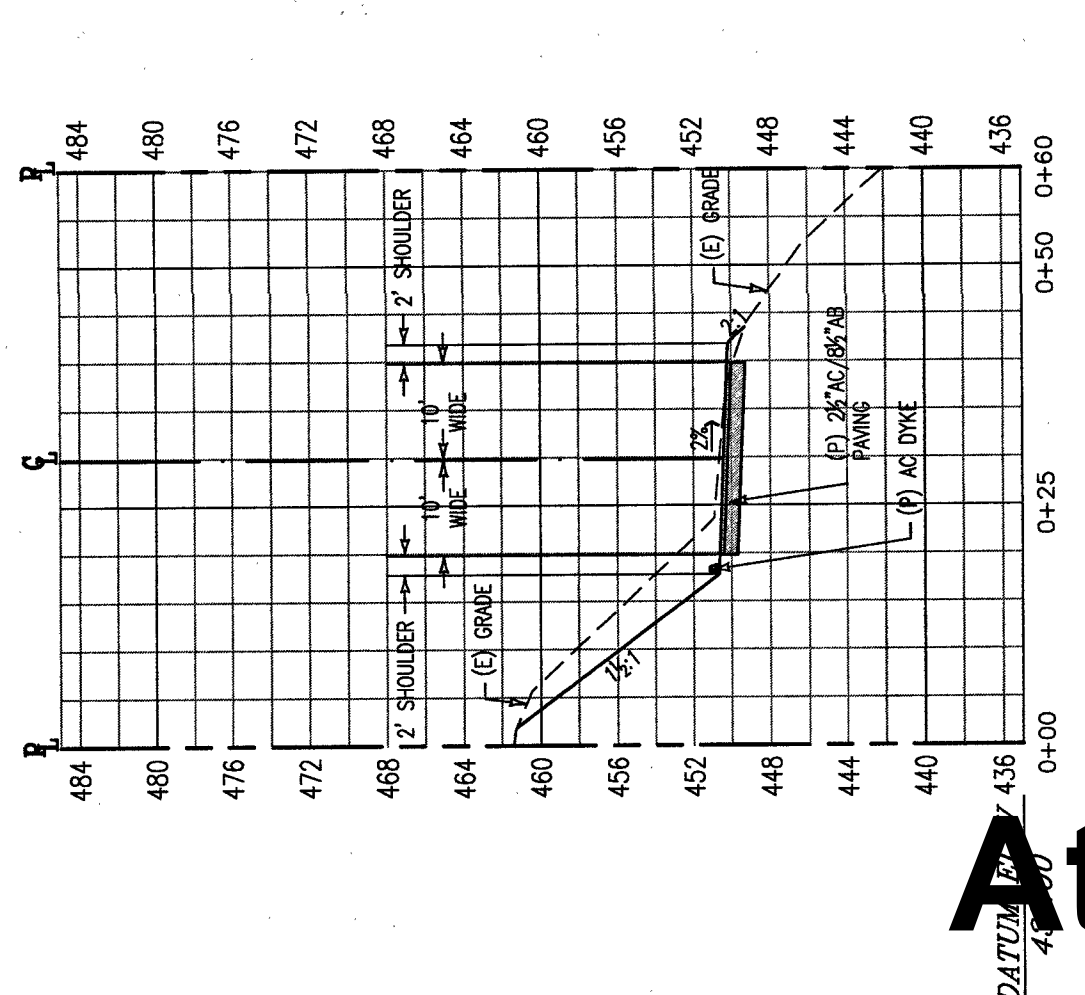
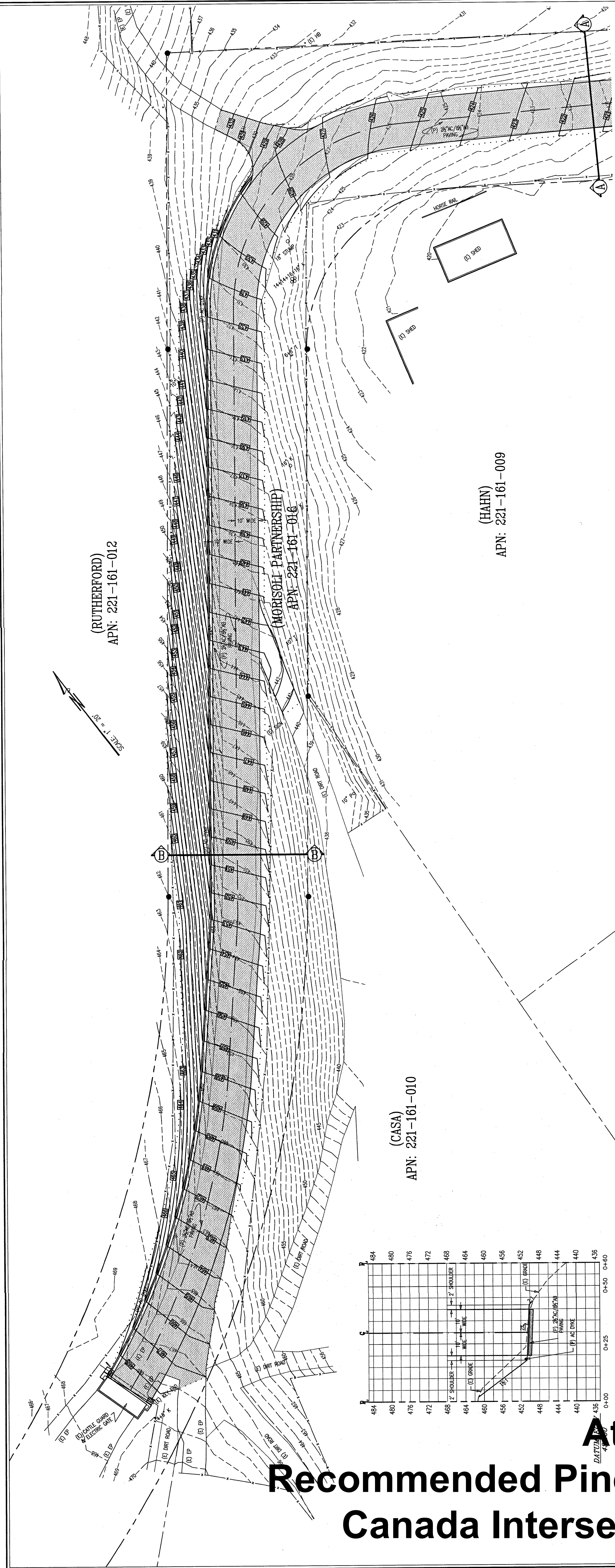
PINE CANYON ROAD / PETTIT ROAD

LEGEND
XX (YY) = AM (PM)

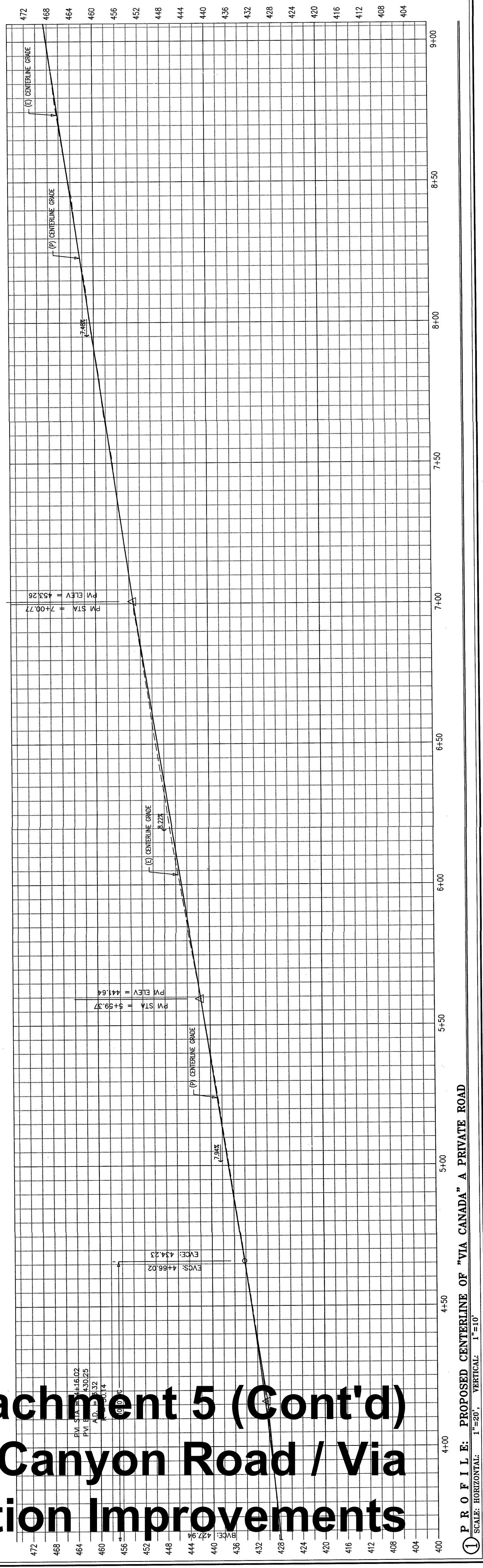
Attachment 4

Pine Canyon Road Intersection

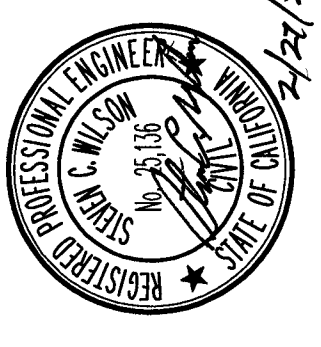
Peak Hour Volumes



③ CROSS SECTION THRU VIA CANADA
SCALE: HORIZONTAL: 1"=20', VERTICAL: 1"=10'



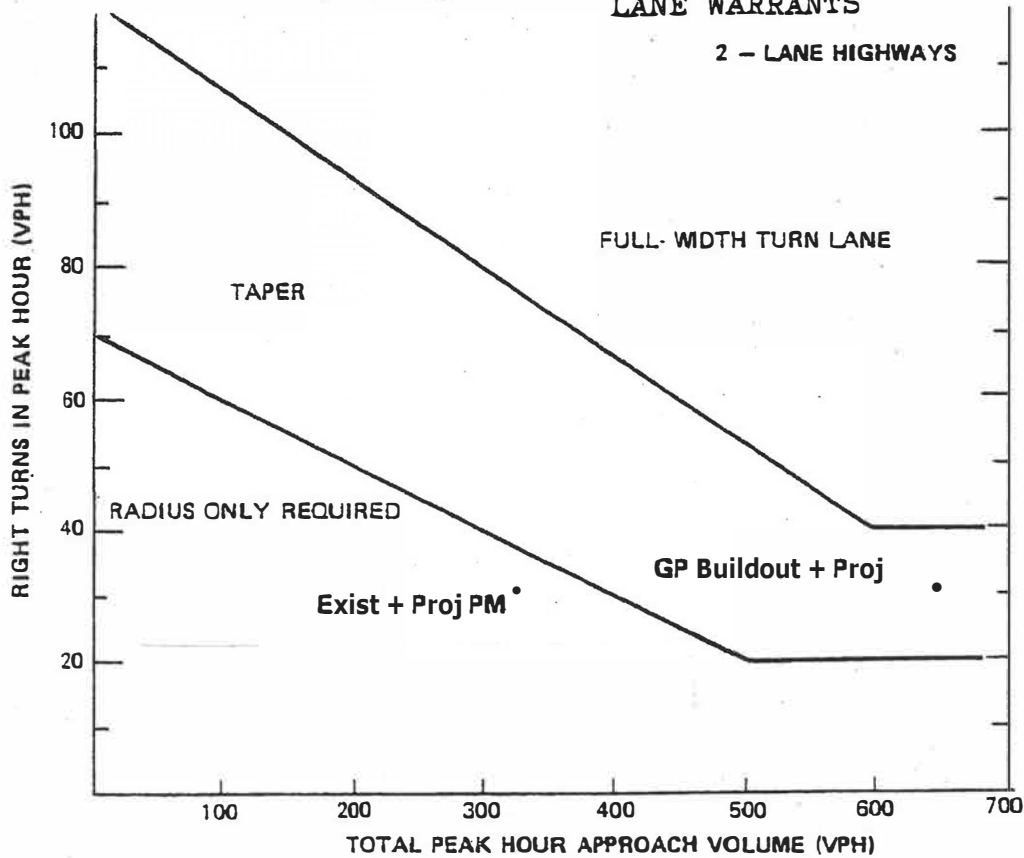
① PROFILE: PROPOSED CENTERLINE OF "VIA CANADA" A PRIVATE ROAD
SCALE: HORIZONTAL: 1"=20', VERTICAL: 1"=10'



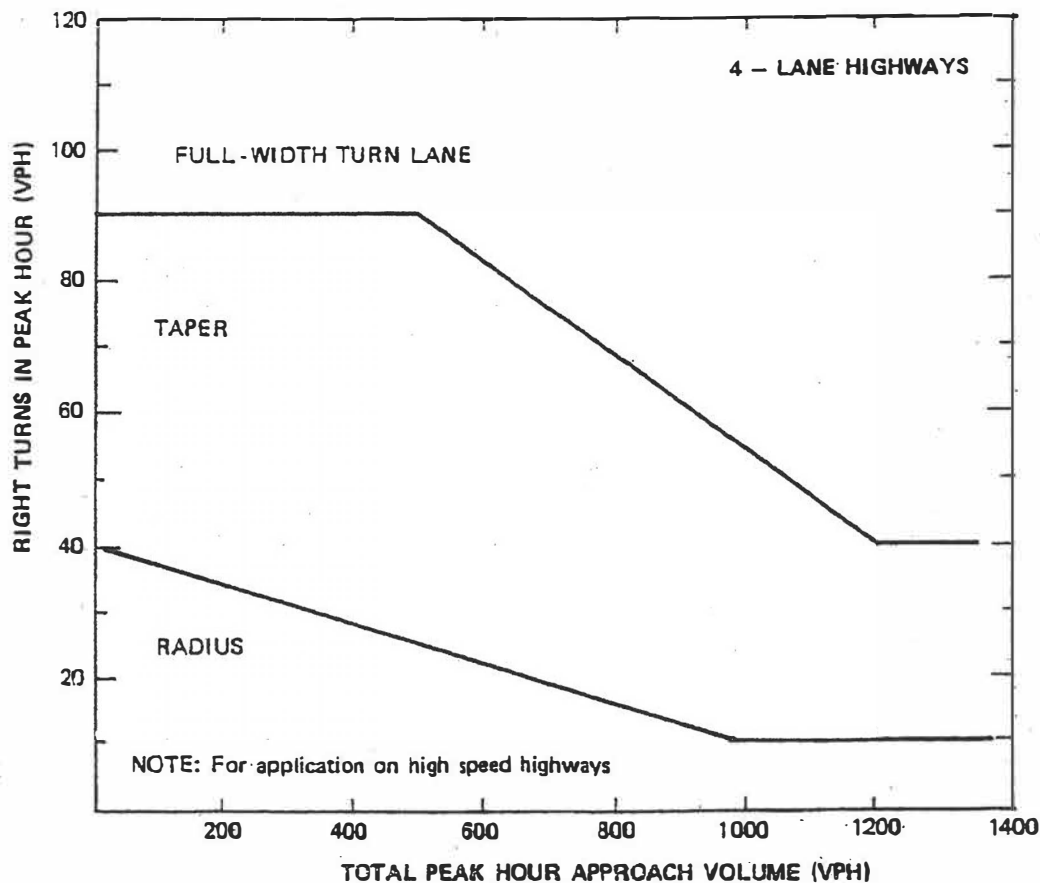
REVISIONS		STREET IMPROVEMENT PLAN	
DATE	BY	GRADING PLAN & PROFILE & CROSS SECTIONS	
		QUAIL HILLS ESTATES, PHASE "A"	
		VIA CANADA & PINE CANYON ROAD INTERSECTION IMPROVEMENTS	
		PART OF S½ SW¼ SEC 13, N½ NW¼ SEC 24, T20S, R0E	
		KING CITY AREA COUNTY OF MONTEREY STATE OF CALIFORNIA	
		PREPARED FOR	
		MORISOLI PARTNERSHIP	
		BY	
		MONTEREY BAY ENGINEERS, INC.	
		807 CHARLES AVE. SUITE B (831) 892-7899 SEASIDE, CALIFORNIA 92083	
SCALE	1" = 20'	DATE	FEBRUARY, 2018
SHEET	C3	DRAWN BY	SPH
JOB No. 18-003			

RIGHT TURN LANE WARRANTS

2 - LANE HIGHWAYS



Source:
"Intersection
Channelization
Design Guide",
NCHRP Report
279, November,
1985.



Attachment 6 Right Turn Lane Warrants

Figure 4-23. Traffic volume guidelines for design of right-turn lanes. (Source: Ref. 4-11)

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